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# CYCLOPÆDIA;

OR,

Universal Dictionary

OF

ARTS, SCIENCES, AND LITERATURE.

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THE

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# *UNIVERSAL DICTIONARY*

OF

# Arts, Sciences, and Literature.

BY

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WITH THE ASSISTANCE OF

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# ARTS and SCIENCES.

## CALVARY.

CALVARY, or Golgotha, in *Ancient Geography*, a mountain of Paleſtine, held in the greateſt veneration as the ſcene of our Saviour's crucifixion. It acquired theſe two names, probably, from its roundneſs, or reſemblance to a human ſkull, or, as others ſay, from its being bare and deſtitute of verdure. Theophylact ſays, that by a tradition deſcended from the fathers, Adam, (or as others ſay, Adam's head) was buried here, and therefore, ſays he, Chriſt, who was to heal the fall and death of Adam, was here crucified, that where the beginning of death was, there might be the diſſolution of it. The witneſſes of this tradition adduced by Theophylact are Origen, Tertullian, Epiphanius, Athanaſius, and St. Auguſtin. St. Jerom obſerves, that this is a favourable interpretation, and pleaſing to the ears of the people; but not true. It anciently ſtood without the walls of the city of Jeruſalem, and was the place where criminals were executed according to the Moſaic law. But the Roman emperor Adrian having ordered the city to be re-built a little to the north of its former ſituation, Mount Calvary was encloſed within the walls. See Ælia *Capitolina*. This mountain was cleared by order of Helena, the mother of Conſtantine; and fitted for the foundation of a church by cutting down ſeveral parts of the rock and elevating others. But this was done with ſo much care, that no part of the hill which immediately related to our Saviour's paſſion was altered or diminiſhed. Accordingly that part of Calvary, where it is ſaid Chriſt was faſtened to the croſs, is left entire; being about 10 or 12 yards ſquare. The magnificent church erected on this ſpot by order of Helena was, therefore, built in ſuch a manner as to comprehend as many ſcenes of our Saviour's ſufferings as could be conveniently encloſed. This ſtately edifice is ſtill ſtanding, and kept in good repair, by the offerings of the pilgrims, who annually reſort to it, as well as the contribution of ſeveral Chriſtian princes. It is 100 paces long, and 60 wide; the walls of it are of ſtone, the roof of cedar; the eaſt end encloſes mount Calvary, and the weſt comprehends the holy ſepulchre. The former is covered with a noble cupola, ſupported by 16 maſſive columns, which were encruſted with marble. The centre of it is open on the top juſt over the ſepulchre; and above the high altar at the eaſt end is another ſtately dome. The nave of the church conſtitutes the choir, and in the inſide aiſles are the places where the moſt remarkable circumſtances of Chriſt's paſſion were tranſacted, together with the tombs of Godfrey and Baldwin, the two firſt Chriſtian kings of Jeruſalem. An aſcent of 22 ſteps leads to a chapel, where that part of Calvary is ſhewn on which Chriſt was crucified, and the very hole in the rock, in which his croſs was fixed. The altar hath three croſſes in it, and is richly adorned with other coſtly embelliſhments, particularly with 46 ſilver lamps of immenſe value, that hang before it and are kept conſtantly burning. Adjoining to this is another ſmall chapel, fronting the body of the church. At the weſt end is that of the ſepulchre, which is hewn out of the ſolid rock, and has a ſmall dome or lantern, ſupported by pillars of porphyry. The cloiſter round the ſepulchre is divided into ſundry chapels, appropriated to the ſeveral ſects of Chriſtians, who uſed to reſide there, ſuch as the Latins, Greeks, Syrians, Armenians, Abyſſines, Georgians, Neſtorians, Cophtites, Maronites, &c. But theſe, ſays Maundrell, except four, viz. the Latins, Greeks, Armenians, and Cophtites, have abandoned their quarters, not being able to ſuſtain the ſevere rents and extortions, which their Turkiſh landlords impoſe upon them. The apartments of the Latins are on the north-weſt; to them belongs the care of the church, and

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they make every day a ſolemn proceſſion, with tapers and crucifixes, and other ceremonies, to the ſeveral ſanctuaries of the church. Accordingly they are obliged to reſide conſtantly in it; the Turks keeping the keys, and not ſuffering any of them to go out, but obliging them to receive their proviſions through a wicket. Eaſter is the time at which the chief ceremonies are performed within this place; and theſe chiefly conſiſt in repreſentations of Chriſt's paſſion, crucifixion, death, and reſurrection. At this ſolemnity, every pilgrim, paying a certain fee, is admitted to aſſiſt at the ſolemn proceſſion and other ceremonies: of theſe there is commonly a vaſt concourſe. Some of them chooſe to enter on Good-Friday, and ſtay till Eaſter-Monday.

CALVARY, a term uſed in catholic countries for a kind of chapel of devotion, raiſed on a hillock near a city; in memory of the place where Jeſus Chriſt was crucified near Jeruſalem. Such is the Calvary of St. Valerian, near Paris; which is accompanied with ſeveral little chapels, in each whereof is repreſented in ſculpture one of the myſteries of the paſſion.

CALVARY, in *Heraldry*, a croſs ſo called, becauſe it reſembles that on which our Saviour ſuffered: it is always ſet upon ſteps.

CALUBO ISLANDS, in *Geography*, lie to the S.E. of Borneo iſland in the Eaſt Indies; a little to the S. of E. from cape Salatan, and to the W. of S. from Laut iſland.

CALUCULA, in *Ancient Geography*, a ſmall town of Spain, placed by Pliny and Ptolemy in the department of Hiſpalis.

CALVELUZZO, in *Geography*, a town of Naples, in the province of Baſilicata; 10 miles S. of Potenza.

CALVENSANO, a town of Italy, in the duchy of Milan, ſeated on the Adda.

CALVENTURAS, a ſmall iſland in the bay of Bengal, near the coaſt of Ava. N. lat. 16° 54′. E. long. 95° 20′.

CALVERT, GEORGE, in *Biography*, baron of Baltimore, founder of the province of Maryland in North America, was the deſcendant of a noble family in Flanders, and born at Kipling in Yorkſhire in 1582. After finiſhing his education at Oxford he became ſecretary to ſir Robert Cecil, in the reign of James I. by whoſe favour he was made clerk of the privy-council, and received the honour of knighthood. In 1619 he was appointed one of the principal ſecretaries of ſtate; but though he diſcharged the office with great fidelity and diligence, he reſigned it in 1624, honeſtly confeſſing to the king that he was become a convert to the Roman Catholic religion. He was continued, however, a member of the privy-council during this reign, and in 1625 created baron of Baltimore in the kingdom of Ireland, at which time he repreſented the univerſity of Oxford in parliament. Having been conſtituted by patent, during his ſecretaryſhip, proprietor of a province in Newfoundland, he named it "Avalon;" and expended upon it a large ſum. But though he twice viſited it in perſon, and reſcued it from a French invaſion, he at length abandoned it, and obtained from Charles I. a patent for the full property of the diſtrict ſince called Maryland. This he ſettled, and in his dealings with the natives diſplayed as much juſtice and good faith as William Penn did in his ſettlement of Pennſylvania. He likewiſe eſtabliſhed a moſt liberal code of religious toleration in his province, ſo that it became not only the reſort of a number of Roman Catholic gentlemen, who firſt accompanied the founder, but alſo an aſylum for many quakers and others, who were perſecuted by the bigotry of the puritans in New England. Lord Baltimore, who appears in all reſpects to have been a man *of worth* and ſound underſtanding, died at London in 1632. Biog. Brit. See MARYLAND.

CALVERT, in *Geography*, a county of Maryland, in the United States of America, on the weſtern ſhore of the Cheſapeak; about 33 miles long, and narrow.

CALVERT'*s Iſland*, an iſland in the North Pacific ocean, near the weſt coaſt of North America. N. lat. 50° 40′. W. long. 128° 10′.

CALVI, a town of Naples, in the province of Lavora, the ſee of a biſhop, ſuffragan of Capua; 5 miles N. of Capua, and not far from the ſea. N. 41° 15′. E. long. 14° 45′.

CALVI, a town on the weſt ſide of the iſland of Corſica, the principal place of a diſtrict in the French department of Golo, containing 2135 inhabitants. It is ſituated on a promontory which advances into the ſea, and forms one of the moſt beautiful harbours in the iſland, called "the gulf of Calvi." It is defended by a citadel on a rock with 5 baſtions; diſtant about 11 leagues W.S.W. of Baſtia. N. lat. 42° 26′. E. long. 9° 7′.

CALVIELLO, a town of Naples, in the province of Baſilicata; 12 miles S.S.E. of Potenza.

CALVIN, JOHN, in *Biography*, an eminent reformer, entitled on account of his talents and character, as well as his peculiar activity and zeal, to the ſecond rank of celebrity among thoſe who contributed to reſcue the Chriſtian church from the errors and ſuperſtitions of Popery, was born of an obſcure family, named Cauvin, at Noyon, in Picardy, in 1509. As he was originally deſigned for the church, he obtained at an early age a benefice in the cathedral church of his native place, and alſo the cure of Pont-l' Evêque. Having purſued the ſtudy of polite literature for ſome time at Paris, where he diſtinguiſhed himſelf by his proficiency, and where he alſo acquired a predilection in favour of the new opinions in religion, from a ſtudy of the Scriptures, recommended to him by Robert Olivetan, he determined to change his profeſſional deſtination; and applied to the ſtudy of the civil law, firſt at Orleans, and afterwards at Bourges. The Scriptures were likewiſe the objects of his particular attention; the more he acquainted himſelf with theſe pureſt ſources of theological knowledge, the more was he confirmed in the opinions he had adopted; and his attachment to them was ſtrengthened by intercourſe with Melchior Wolmar, a German profeſſor of the Greek language at Bourges. Upon his father's death he was obliged to return to Noyon, where he reſigned his eccleſiaſtical benefices; and ſoon after removing to Paris, he publiſhed, in 1532, an eloquent Latin commentary on Seneca's treatiſe "De Clementia," on clemency. In the title of this book he latinized his name Cauvin into Calvinus, whence he afterwards aſſumed his common appellation of Calvin. His attachment to the reformation being now generally known, he was under a neceſſity of ſuddenly quitting Paris, and of retiring to Angouleme, where he obtained a ſubſiſtence by teaching Greek. Here he was admitted into the houſe of Lewis du Tillet, canon of the church, whom he had proſelyted to the reformed religion; and during his reſidence in this place he wrote the greateſt part of his "Inſtitute." Notwithſtanding ſome degree of protection which was afforded him by the queen of Navarre, he thought it moſt prudent to leave France, and in 1534 he withdrew to Baſil, and in the following year publiſhed his celebrated work, entitled "Inſtitutes of the Chriſtian Religion." The deſign of this work was to exhibit a juſt view of the principles of the reformed, and to prevent their being confounded with the Anabaptiſts and other enthuſiaſts. It was addreſſed to Francis I. by a dedicatory epiſtle, which is much applauded as the fineſt ſpecimen of modern Latinity, and which was intended to ſoften the unrelenting fury of that prince againſt the Proteſtants. This work has been always much admired by perſons of ſimilar ſentiments, for the elegance of its ſtyle, the perſpicuity of its method, and the force of its reaſoning. It paſſed through ſeveral editions, which were ſucceſſively enlarged and improved; it was tranſlated by Calvin into French; and verſions of it were made in all the principal modern languages. To ſome editions is prefixed the device of a flaming ſword, with the motto, "Non veni mittere pacem ſed gladium;" *i. e.* "I came not to ſend peace but a ſword." After the publication of this work, Calvin went to Italy for the purpoſe of viſiting the ducheſs of Ferrara, who was a convert to the reformed religion, and who received him with great kindneſs. On his return to France, he propoſed to purſue his journey to Straſburgh or Baſil; but being obliged, on account of the war that then prevailed, to paſs through the territories of the duchy of Savoy, he took Geneva in his way; and being urged by the preſſing ſolicitation of Farel, Viret, and other zealous reformers, to ſettle in that city, he accepted the offices of preacher and profeſſor of divinity, which were conferred upon him with the conſent of the people, by the conſiſtory and magiſtrates. This ſettlement took place in 1536. In the following year he began to diſplay his arbitrary ſpirit, by obliging all the people to ſwear ſolemnly to a body of doctrines, which alſo contained a renunciation of popery; and by refuſing to celebrate the Lord's ſupper, till certain irregularities that ſubſiſted in the church at Geneva were rectified. He alſo declared, that he could not ſubmit to the regulations, which had been lately made by the Synod of the canton of Berne, and which required the uſe of unleavened bread in the euchariſt, the baptiſmal fonts which had been removed out of the churches, and the feaſts, which had been aboliſhed, to be reſtored at Geneva. This occaſioned a conflict, which terminated in an order of the aſſembly of the people, ſummoned by the ſyndics, that Calvin, Farel, and another miniſter, ſhould leave the city within two days. Calvin retired to Straſburgh, where he was allowed to found a church according to his own model. There he married a wife; and publiſhed his "Commentary upon the Epiſtle to the Romans." During his abſence, his friends at Geneva were very anxious for his return; and they at length prevailed, ſo that he arrived thither in September, 1541. After his re-ſettlement he began with eſtabliſhing a form of eccleſiaſtical diſcipline, and a conſiſtorial juriſdiction, inveſted with full powers to inflict all kinds of cenſures and canonical puniſhments, as far as excommunication. See Calvinism. This eſtabliſhment was much diſapproved by ſeveral perſons, who expreſſed their apprehenſions, that papal tyranny would ſoon be revived. Calvin, however, was inflexible; and on all occaſions aſſerted the rights of the conſiſtory, of which he was perpetual preſident, as he alſo was of the aſſembly of the clergy. But fully appriſed of the exorbitant power which accrued from this office, he adviſed, on his death-bed, that no perſon ſhould again be inveſted with ſuch authority; and after his time the office of preſident ceaſed to be perpetual.

Such was the extent of Calvin's ambition and views, that he formed a project of making the republic of Geneva the mother and ſeminary of all the reformed churches, as Wittemburg was of the Lutheran. From hence miniſters were to be deputed to diffuſe and ſupport the proteſtant cauſe throughout the world. Here he deſigned to originate an uniform model of doctrine and diſcipline; and Geneva was to be, as it were, the "Rome" of proteſtantiſm. His plan was purſued with vigour and perſeverance. An academy was inſtituted in this city, to which his own talents and learning, and thoſe of his colleague Beza, and of other eminent perſons, attached a degree of reputation that attracted ſtudents from all countries where the reformation had taken root. The ſucceſs of Calvin in his project was ſo great, that the preſbyterian model of church government gradually held a kind of divided empire with the Lutheran and Proteſtant epiſcopalian. When Calvin had formed and eſtabliſhed his ſyſtem of doctrine and church government, (See Calvinism,) he was too tenacious of his own opinion, and too arbitrary in the exerciſe of his authority, to allow any deviation or oppoſition among thoſe to whom his influence extended. Of this unamiable peculiarity of his character, inſtances occur under the articles Blandrata, Bolsec, and Castalio; but that which entails the greateſt diſgrace on his memory was his treatment of Servetus. Whilſt he was paſſing through Geneva, in order to ſeek an aſylum in Italy from the perſecution of Roman catholics, he was apprehended at the inſtigation of Calvin, tried on a charge of blaſphemy, condemned, and committed to the flames. The mere ſtatement of this fact is ſufficient to expoſe it; and no apology can be deviſed to extenuate it, but ſuch as ariſes from the intolerant ſpirit which generally prevailed, and which, for many ages, it was thought not only lawful but laudable to exerciſe againſt perſons who were deemed to hold unſcriptural and heretical opinions, conceived to be inconſiſtent with the unity of the church, and the ſafety of the civil ſtate.

The courſe of Calvin's life comprehended a great variety of paſtoral cares and literary labours; and it was terminated by ſickneſs and labour at comparatively an early period, in May 1564, as he was nearly compleating his 55th year. The character of this learned and active reformer has been groſsly calumniated by bigots of various deſcriptions; and more eſpecially by thoſe of the church of Rome. But it is juſtly obſerved by a liberal and candid biographer, that, whilſt his morals, in the ordinary ſenſe of the term, appear to have been irreproachable, his chief faults conſiſted in a reſemblance to thoſe uncharitable perſons who have cenſured and traduced him. His extraordinary talents have been acknowledged by the moſt eminent perſons of his age; and they were ſuch as would have rendered him a diſtinguiſhed ſcholar, if his attention had not been wholly, or at leaſt principally, devoted to theological ſtudies and eccleſiaſtical occupations. His writings are numerous. Beſides his "Inſtitute," he publiſhed learned commentaries upon moſt of the books of the New Teſtament, and upon the prophets in the Old. He refrained from commenting on the book of Revelation, much to his praiſe, according to the judgment of Scaliger and Bodin, becauſe he thought it impenetrably obſcure, and of dubious authority. Many zealous believers were offended by his applying to the temporal circumſtances of the Jews ſeveral ancient prophecies that have been thought to refer to the Meſſiah, and to furniſh arguments in confirmation of the Chriſtian cauſe. In this reſpect, however, he thought for himſelf, and eſcaped the odium of ſervile attachment to generally received opinions. To his other more elaborate works he added many controverſial pieces; and all his treatiſes were collected in 1560, in 9 vols. folio. His opinions, which are now better known than his writings, have been the ſubjects of innumerable controverſies. For an abſtract of them, ſee the next article. Gen. Dict. Moſheim. E. H. Vol. iv. Gen. Biog.

CALVINISM, the doctrine and ſentiments of Calvin, and of his followers, with regard to matters of religion.

Calviniſm ſubſiſts in its greateſt purity in the city of Geneva; and from thence it was firſt propagated into Germany, France, the United Provinces, and England. In

Germany, we may reckon among its chief patrons, Frederick III. elector Palatine, who, in 1560, removed from their paſtoral functions, the Lutheran doctors, and filled their places with Calviniſts; and, at the ſame time, obliged his ſubjects to embrace the tenets, rites, and inſtitutions of the church of Geneva. This order was abrogated in 1576 by his ſon and ſucceſſor Lewis, who reſtored Lutheraniſm; but in 1583, Calviniſm was again reſtored, under the government of the elector John Caſimir, and became triumphant. In France it was aboliſhed by the revocation of the edict of Nantes, in 1685. It has been the prevailing religion in the United Provinces ever ſince the year 1571. The theological ſyſtem of Calvin was adopted, and made the public rule of faith in England, under the reign of Edward VI.; and the church of Scotland was modelled by John Knox, the diſciple of Calvin, agreeably to the doctrine, rites, and form of eccleſiaſtical government, eſtabliſhed at Geneva. In England it has declined ſince the time of queen Elizabeth; though it ſtill ſubſiſts, ſome ſay a little allayed, in the articles of the eſtabliſhed church; and in its rigour in Scotland. See REFORMATION, and *Reformed* CHURCH.

The diſtinguiſhing theological tenets of Calviniſm, as the term is now generally applied, reſpect the doctrines of PREDESTINATION, or *particular* ELECTION and REPROBATION, *original* SIN, *particular* REDEMPTION, *effectual*, or, as ſome have called it, *irreſiſtible* GRACE in *regeneration*, JUSTIFICATION *by faith*, PERSEVERANCE, and the TRINITY. See each of theſe articles. See alſo ARMINIANS.

Beſides the doctrinal part of Calvin's ſyſtem, which, ſo far as it differs from that of other reformers of the ſame period, principally regarded the abſolute decree of God, whereby the future and eternal condition of the human race was determined out of mere ſovereign pleaſure and free will; it extended likewiſe to the diſcipline and government of the Chriſtian church, the nature of the euchariſt, and the qualification of thoſe who were intitled to the participation of it. Calvin conſidered every church as a ſeparate and independent body, inveſted with the power of legiſlation for itſelf. He propoſed that it ſhould be governed by preſbyteries and ſynods, compoſed of clergy and laity, without biſhops, or any clerical ſubordination; and maintained, that the province of the civil magiſtrate extended only to its protection and outward accommodation. In order to facilitate an union with the Lutheran church, he acknowledged a real, though ſpiritual, preſence of Chriſt in the euchariſt, that true Chriſtians were united to the man Chriſt in this ordinance, and that divine grace was conferred upon them, and ſealed to them, in the celebration of it; and he confined the privilege of communion to pious and regenerate believers. See EUCHARIST, &c. and LUTHERANISM.

In France the Calviniſts are diſtinguiſhed by the name of Hugonots; and, among the common people, by that of Parpaillots. In Germany they are confounded with the Lutherans, under the general title Proteſtants; only ſometimes diſtinguiſhed by the name Reformed.

CALVINISTS, *crypto*, a name given to the favourers of Calviniſm in Saxony, on account of their ſecret attachment to the Genevan doctrine and diſcipline. Many of them ſuffered by the decrees of the convocation of Torgaw, held in 1576. See *Form of* CONCORD.

The Calviniſts in their progreſs have divided into various branches, or leſſer ſects.

CALVINO, *Cape*, in *Geography*, is the moſt weſterly cape of the Morea, E. of Zante Iſland, and S.W. from the S. point of the entrance into the gulf of Lepanto.

CALVISANO, a town of the Breſſan, belonging to the ſtate of Venice; 12 miles S.S.E. of Breſcia.

CALVISIANA, in *Ancient Geography*, a place of Sicily between Agrigentum and Hybla, on the route from Lilybæum to Meſſina, according to the Itinerary of Antonine. M. d'Anville places it at a little diſtance N.W. of Gala, on the ſouthern coaſt.

CALVISIUS, SETHUS, or CALVITZ, in *Biography*, a German chronologer, was born at Groſleb, in Thuringia, in 1556, held the office of chantor at Leipſic, to which he was appointed in 1582, and died in 1615. His principal work was his "Opus Chronologicum," publiſhed at Frankfort in 1685, fol. In the compilation of this work, he adopted aſtronomical principles, and drew up aſtronomical tables, by means of which he fixed and compared different epochas. He alſo formed a ſyſtem of chronology from the beginning of the world to his own time; in which he inſerted the hiſtory of all ages, deſcribed by ſuch circumſtances, that even children might comprehend in their minds a continued ſeries or ſynopſis of hiſtory. Scaliger ſpeaks in terms of high commendation of this work, though the impreſſion of it was for ſome time prohibited by the governors of the univerſity of Leipſic. However, John Kepler the celebrated mathematician, and other perſons of leſs note, wrote againſt it. Calviſius publiſhed at Erford in 1610, in 4to., "Enodatio duarum Queſtionum, viz. circa Annum Nativitatis et Tempus Miniſterii Chriſti;" and in 1612, "Elenchus Calendarii Gregoriani, et duplex Calendarii melioris Forma," Franc. Marchionum, 4to. In this "Elenchus," he propoſes two points; firſt, to explode the Gregorian calendar by the principles of aſtronomy, and next to point out a truer and more convenient form of a calendar. Calviſius is reckoned among the heretics of the firſt rank in the "Index Expurgatorius," publiſhed at Madrid in 1667. According to Walter, in his "Muſical Lexicon," he was a very learned theoriſt, and good practical muſician; of which he has left ample proofs to poſterity in his ſhort treatiſe called "ΜΕΛΟΠΟΙΑ, ſive Melodiæ condendæ ratio, quam vulgò muſicam poeticam vocant, ex veris fundamentis extracta et explicata," 1592. This ingenious tract contains, though but a ſmall duodecimo volume, all that was known at the time, concerning harmonics and practical muſic; as he has compreſſed into his little book the ſcience of moſt of the beſt writers on the ſubject; to which he has added ſhort compoſitions of his own, to illuſtrate their doctrines and precepts. With reſpect to compoſition, he not only gives examples of concords and diſcords and their uſe in combination, but little canons and fugues of almoſt every kind then known.

He compoſed, in 1615, the 150th pſalm in twelve parts, for three choirs, as an Epithalamium on the nuptials of his friend Caſper Ankelman, a merchant of Hamburgh, and publiſhed it in folio at Leipſig, the ſame year. Several of his hymns and motets appear in a collection of Lutheran church-muſic, publiſhed at Leipſic, 1618, in eight volumes 4to. under the following title: "Florilegium portens CXV. ſelectiſſimas Cantiones, 4, 5, 6, 7, 8, voc. præſtantiſſimorum Auctorum." Some of theſe we have had the curioſity to ſcore, and have found the laws of harmony and fugue preſerved inviolate. Gen. Dict. Burney's Hiſt. Muſic, vol. iii.

CALVISSON, in *Geography*, a town of France, in the department of the Gard, half a league E. of Sommiéres, and three S.W. of Nimes.

CALVITI, a town of Naples, in the province of Calabria Citra; 11 miles E. of Cariati.

CALVITIES, or CALVITIUM. See BALDNESS.

CALUMET, in *Modern Hiſtory*, a myſtic kind of pipe uſed by the American ſavages as the enſign of peace, and for religious fumigation. This is a ſymbol of friendſhip univerſal among the people of North America, and the preſentation of it is an uſage of arbitrary inſtitution peculiar to them. The acceptance of it is a token of concurrence with the terms propoſed; and the refuſal as certain a ſignal of rejection. When this pipe is offered, even in the midſt of the rage of a conflict, the weapons of hoſtility drop inſtantly from their hands, and a truce enſues.

The calumet is a ſort of tobacco-pipe, made of red, black, or white marble. When they treat of war, the pipe and its ornaments are commonly red. The ſhank is decorated with rounds of feathers, and locks of hair, or porcupines quills: in it they ſmoke in honour of the ſun. M. Laſitau will have it to be the original CADUCEUS of Mercury, of which that uſed by the Greeks and Romans, with its wings and its ſerpents, was only the copy.

The calumet is the ſymbol and ſecurity of traffic; by it they pronounce life and death, peace and war: they alſo aſcribe to it a power of raiſing the ſouls of the dead.

Among the Indians, there is alſo a ſolemn rite, called the "dance of the calumet," which they perform on various occaſions. They are not allowed to waſh themſelves in the rivers at the commencement of ſummer, nor to taſte the new fruits, without performing it; and the ſame ceremony always confirms a peace, or precedes a war. In winter it is performed in their cabins, and in ſummer in the open fields. Having choſen a ſpot among trees, ſhaded from the heat of the ſun, they lay in the middle of it a large mat, and ſet upon it the monitor, or god, of the chief of the company. On the right hand of this image, they place the calumet, as their great deity, erecting around it a kind of trophy with their arms. Thoſe who are to ſing on the occaſion take the moſt honourable ſeat under the ſhade of the trees. When the company is arranged, each perſon, before he ſits down, ſalutes the monitor, by blowing upon it the ſmoke of their tobacco; then every one in rotation receives the calumet, and holding it with both hands, dances to the cadence of the vocal muſic, which is accompanied by the beating of a ſort of drum. During this exerciſe, he gives a ſignal to one of their warriors, who, taking a bow, arrow, and axe, out of the trophies above-mentioned, fights him; whilſt he defends himſelf with the calumet only; and both of them continue the paſtime of dancing. When this mock-engagement is concluded, he who holds the calumet makes a ſpeech, recounting the battles he has fought, and the priſoners he has taken, and then receives a cloak, or ſome other preſent, from the chief of the ball. He then reſigns the calumet to another; who, having acted a ſimilar part, delivers it to a third perſon; and thus in rotation, till at laſt the inſtrument returns to the perſon who began the ceremony; by whom it is preſented to the nation invited to the feaſt as a mark of friendſhip, and a confirmation of their alliance, when this is the occaſion of the entertainment.

CALUMET, *Grand*, in *Geography*, a portage of Lower Canada, in North America, on the northern bank of the river Utawas. This is the longeſt carrying place on this river, and is about two thouſand and thirty-five paces. It is a high hill or mountain. From the upper part of this portage the current is ſteady, and is only a branch of the Utawas river, which joins the main channel, that keeps a more ſouthern courſe, at the diſtance of 12 computed leagues. Six leagues further it forms lake Coulonge, which is about four leagues in length; from whence it proceeds through the channels of the Allumettes to the portage, where part of the lading is taken out, and carried 342 paces. Then ſucceeds the portage des Allumettes, which is but 25 paces, over a rock difficult of acceſs, and at a ſhort diſtance from lake Coulonge. From portage de Chenes to this ſpot is a fine deer hunting country, and the land in many parts fit for cultivation. From hence the river ſpreads wide, and is full of iſlands, with ſome current for ſeven leagues, to the beginning of "Riviere Creuſe," or DEEP RIVER. Grand Calumet lies in N. lat. 45° 40′. W. long. 77° 10′. Mackenzie's Voyages. Introd. p. 33.

CALUMNY, the crime of accuſing another falſely and knowingly of ſome heinous offence. *Calumnia eſt malitioſa & mendax informatio.*

It is an ancient maxim, which experience ſhews us to be too well founded: *Audacter calumniare, ſemper aliquid hærebit.*

CALUMNY, *oath of*, *Juramentum*, or rather *Jusjurandum calumniæ*, among civilians and canoniſts, was an oath which both parties in a cauſe were obliged to take; the plaintiff, that he did not bring his charge, and the defendant, that he did not deny it, with a deſign to abuſe each other, but becauſe they believed their cauſe was juſt and good; that they would not deny the truth, nor create unneceſſary delays, nor offer the judge or evidence any gifts or bribes. If the plaintiff refuſed this oath, the complaint or libel was diſmiſſed; if the defendant, it was taken *pro confeſſo*.

This cuſtom was taken from the ancient athletæ, who, before they engaged, were to ſwear they had no malice, nor would uſe any fraudulent or unfair means for overcoming the other. The *juramentum calumniæ* is much diſuſed as a great occaſion of perjury. Anciently the advocates and proctors alſo took this oath; but of late it is diſpenſed with, and thought ſufficient that they take it once for all at their firſt admiſſion to practice.

CALUMNIÆ, *judicium*, was an action brought againſt the plaintiff in a court for a falſe and malicious accuſation. When an accuſer did not prove his charge, nor ſeemed to have ſufficient or probable grounds for bringing any, the judges in pronouncing ſentence uſed the formula *calumnioſus es*; which gave the defendant a right to bring an action of calumny; the penalty of which was *frontis inuſtio*, or burning on the forehead. See ACCUSATION.

CALUMNY, in the *Arts*, was admirably perſonified by Apelles. This celebrated painter was accuſed of having conſpired againſt Ptolemy, king of Egypt; and being delivered from the danger that threatened him, he determined to avenge himſelf of the calumny by a picture, which was always held in high eſtimation. On the right was ſeated a man with large ears, reſembling Midas; he ſtretched out his hand towards Calumny, who approached him; and near him were placed two female figures, thoſe of Ignorance and Diffidence. On the other ſide ſtood Calumny, who was a beautiful female, that appeared agitated and enraged: ſhe held in her left hand a flaming torch, and with her right ſhe dragged by the hair a youth, lifting his hands towards the heavens, and calling the gods to witneſs in his favour. Before her moved a pale and deformed man, with piercing eyes, who ſeemed to have juſt recovered from a long illneſs: this was Envy. Two other females converſed with Calumny; theſe were Concealment and Deceit. Another female followed, cloathed in black, with tattered garments, which was Repentance: ſhe turned her head backward, diſſolved in tears, and looked with ſhame on Truth, who approached her. Lucian, in his "Dialogue againſt Calumny," has tranſmitted to us this model of moral allegory.

CALVORD, in *Geography*, a town of Germany, in the circle of Lower Saxony, and duchy of Magdeburg; 24 miles N.W. of Magdeburg.

CALUPENA, in *Ancient Geography*, a country of Aſia, on the frontiers of the Leſſer Armenia, and of the country of

Lanaſena, according to Strabo (vol. ii. p. 838,) who ſays, that it belonged to the prieſt of the temple of Zela.

CALUS, *Eſbet*, a river of Aſia, whoſe mouth was S.W. of the town of Rhizæum, in a bay of the Euxine ſea, at ſome diſtance E. of Trapezus.

CALUSIO, in *Geography*, a town of Italy, in the principality of Piedmont; 5 miles N. of Chivaſſo.

CALW, a town of Germany, in the circle of Swabia, and duchy of Wurtemburg, on the Nagold, having a manufacture of ſerges and of china; 16 miles W. S. W. of Stuttgard, and 24 E.S.E. of Raſtadt.

CALX. See CALCINATION and LIME.

CALX *of Antimony*. See ANTIMONY.

CALX *of braſs*, is called ÆS USTUM.

CALX *jovis*, the *calx* of TIN, called PUTTY.

CALX *lunæ*, the *calx* of SILVER.

CALX *martis*, the crocus or ſaffron of IRON.

CALX *mercurii*, precipitated MERCURY.

CALX *nativa*, in *Natural Hiſtory*, a native marley earth, which, without burning, has ſome of the qualities of the artificial lime, and was called by the ancients, *gypſum tymphaicum*. See CALCAREOUS EARTHS.

CALX *nitrata*. See NITRE *of lime*.

CALX *ſaturni*, is ceruſs calcined with ſpirit of vinegar, or in the ſun. See CERUSSE.

CALX *ſaturni*, is alſo uſed for MINIUM or RED LEAD.

CALX *ſolis*, denotes calcined GOLD.

CALX *terræ*, a denomination given by Paracelſus to the bolar and argillaceous earths. He has alſo given the name of calx to the chalky matter formed in the joints of gouty perſons.

CALX *veneris*, VERDIGRISE.

CALX *viva*, quick-lime, that on which no water has been caſt ſince its burning, in oppoſition to *calx extincta*, that ſlacked by the affuſion of water. See LIME.

CALX *viva philoſophorum*, denotes that made of quick-ſilver.

CALX, in *Anatomy*. See CALCANEUM.

CALYBE', in *Ancient Geography*. See CABYLE.

CALYBE', in *Mythology*, an ancient prieſteſs of the temple of Juno, the form of which is aſſumed by the fury Alecto, in the Æneid, in addreſſing Turnus.

CALYBE, in *Ornithology*, *Calybé de la Nouvelle Guinée*, Buffon, the blue green bird of paradiſe, deſcribed by Gmelin under the title of *Paradiſea viridis*.

CALYBITES, the inhabitants of a cottage, an appellation given to divers ſaints on account of their long reſidence in ſome hut, by way of mortification. The word is formed from *καλυπτω*, *tego*, *I cover*; whence *καλυβη*, *a little cot*.—The Romiſh church commemorates St. John the *calybites* on the 15th of December.

CALYCADNUS, in *Ancient Geography*, a river of Aſia, in Cilicia Trachea; whoſe mouth was between the two promontories of Zephyrium and Sarpedon. The ſame name is alſo given by Livy and Appian to a promontory of Aſia, ſuppoſed to be the ſame with Zephyrium.

CALYCANTHEMÆ, in *Botany*, (from *καλυξ*, *calx*, and *ανθος*, *flower*,) the fortieth of the natural orders of Linnæus, in his Philoſophia Botanica, and the ſeventeenth of his poſthumous lectures, publiſhed by Giſeke. In the Philoſophia Botanica, it contains the following genera, epilobium, œnothera, juſſiæa, ludvigia, oldenlandia, iſnardia, ammannia, peplis, lythrum, glaux, and rhexia. In the poſthumous lectures, oldenlandia is withdrawn, and the following added: gaura, griſlea, mentzelia, looſa, frankenia, melaſtoma, and oſbeckia. In ſome of theſe genera the calyx is ſuperior, and in others inferior; but in all it ſupports the ſtamens, and if there be a corolla, of courſe that likewiſe. The name is derived from this circumſtance, but it is not well-choſen, as many plants which have the ſame character are not included under it.

It is alſo the ſeventh order of the fourteenth claſs in the ſyſtem of Ventenat, where, though founded on the ſame general idea, it is ſtill leſs comprehenſive. Its genera are pemphis, ginoria, lawſonia, lythrum, aciſanthera, parſonia, cuphea, iſnardia, ammania, glaux, and peplis. In all theſe the calyx is inferior; and the corolla, when preſent, is inſerted upon it, alternating with its diviſions.

CALYCANTHUS, in *Botany*, (from *καλυξ*, *calyx*, and *ανθος*, *a flower*, ſo called becauſe the calyx reſembles a corolla.) Linn. gen. 639. Schreb. 870. Willd. 1005. Juſſ. 342. Vent. vol. iii. p. 357. (Butneria, Duham. Baſteria, Miller, Beureria, Ehret.) Claſs and order, *icoſandria polygynia*. Nat. ord. undetermined by Linnæus. *Roſaceæ*, Juſſ. Allied to the *roſaceæ*, Vent.

Gen. Ch. *Cal.* perianth one-leafed, pitcher-ſhaped, deeply divided, ſegments numerous, linear-lanceolate, coloured. (Caduceous, Vent.) *Cor.* petals numerous, ſtrap-ſhaped, acuminate, attached to the calyx within its diviſions, and exactly reſembling them. *Stam.* twenty, much ſhorter than the petals; anthers oblong, erect, furrowed. *Piſt.* germs numerous, ſuperior; ſtyles awl-ſhaped, compreſſed, the length of the ſtamens; ſtigmas glandulous. *Per.* none, except the bottom of the calyx, which thickens, becomes ſucculent, and takes the form of a berry. *Seeds* many, tailed.

Eſſ. Ch. *Calyx* one-leafed, pitcher-ſhaped, with coloured ſegments. *Petals* reſembling the ſegments of the calyx. *Seeds* many, tailed, within a ſucculent calyx.

*Obſ.* Linnæus gives the flower no corolla, but a calyx with many diviſions in two concentric ranks, all reſembling petals; and Schreber and Martyn adopt his ideas. But we have preferred the deſcription of La Marck and Ventenat, Juſſieu having obſerved, that the inner rank probably conſiſts of petals; and Linnæus himſelf having, perhaps, incautiouſly, doubtleſs inconſiſtently, admitted the term petals into both his ſpecific characters. Sp. 1. C. *floridus*, Carolina all-ſpice, Linn. Sp. pl. La Marck, Illuſ. Pl. 445. fig. 1. (Butneria, Duhamel, Tab. 45. Baſteria, Mill. icon. 60. Beureria, Ehret. Tab. 13. Frutex corni foliis, Cateſb. Car. 1. p. 46. Tab. 46.) "Petals longer than the diviſions of the calyx." A ſhrub three or four feet high, or more in its native country. *Stem* irregularly branched, covered with a brown aromatic bark. *Leaves* oppoſite, petioled, egg-ſhaped, acute, entire, on ſhort petioles. *Stipules* none. *Flowers* of a duſky purple colour, about an inch and a half or two inches in diameter; the petals incurved at the top; peduncles ſhort, ſolitary, pubeſcent. A native of Carolina. Boſc aſſerts, from his perſonal obſervation in Carolina, that Linnæus has confounded two diſtinct plants under one name. Both have oppoſite, egg-ſhaped, lanceolate leaves, without ſtipules, but thoſe of one are pubeſcent and large, of the other, ſmooth and ſmaller; the flowers of the former are alſo larger, of a deeper red colour, and have a ſtrong unpleaſant ſmell, which thoſe of the latter have not. Profeſſor Martyn mentions two varieties, the one with oblong, the other with roundiſh, egg-ſhaped leaves, but they do not correſpond with Boſc's two ſpecies, the latter of which does not appear to be known in England. The former was introduced into our gardens, by John Cateſby, ſo early as 1726. It will thrive in the open air, if planted in a warm ſituation and dry ſoil. It is propagated by laying down the young branches, which ſhould be done in Autumn; in the ſpring twelvemonth after, the layers ſhould be ſeparated from the parent ſtock, and ſet where they are deſigned to remain. Some old tanners' bark ſhould be laid on the ſurface to keep out the froſt while the plants are young. Boſc informs us, that the flowers and ends of the branches infuſed in brandy make a pleaſant liquor, and that the ſeeds are thought, in America, to be poiſonous to dogs and foxes. 2. C. *præcox*, Linn. Sp. La Marck Illuſt. Pl. 415. fig. 2. (Obai or Robai, Kæmpf. Amœn. 878. Tab. 879.) "Petals ſhorter than the diviſions of the calyx." *Leaves* egg-ſhaped lanceolate. *Flowers* appearing before the leaves, yellow; petals ſmall, beſprinkled with red ſpots. *Fruit* longer, ſcaly and rough. *Seeds* five or ſix, which ſoon loſe their tail, and reſemble French beans. A native of Japan and China, introduced into England in 1771.

CALYCERA, (from καλυξ, *calyx*, and κερας, a *horn*.) Willd. Cavan. ic. 4. p. 34. Tab. 358. Claſs and order, *ſyngeneſia ſegregata*.

Eſſ. Ch. Common calyx many-leaved; proper calyx five-toothed. Florets tubular, male and hermaphrodite. Receptacle chaffy. Seeds naked.

Sp. C. *herbacea*. *Root* fungous. *Stems* a foot high, erect, ſimple, ſmooth, round, hollow. *Leaves* linear-lanceolate, pinnatifid, toothed; ſtem ones nearly ſeſſile; radical ones on long petioles. *Flowers* compound, globular, terminal; barren and fertile florets intermixed; teeth, in the barren florets, egg-ſhaped, acute, very ſhort; in the fertile ones, lanceolate-awl-ſhaped, twice the length of the corolla. *Seed* ſingle, naked, at the bottom of the calyx. *Receptacle* ſomewhat globular. A native of Chili.

CALYCIFLORÆ, a natural order formed by Linnæus for four genera, Oſyris, Trophis, Hippophæ, and Elœagnus; but, as we learn from Giſeke, afterwards aboliſhed.

CALYCIFLORUS in *Zoology*, a ſpecies of BRACHIONUS, firſt deſcribed by Baker in his Eſſays on the Microſcope, and ſince by Profeſſor Pallas. It is defined by the latter as being of a ſimple form, calyculate, with the ſhell crenated behind, and the upper lip of the mouth four-toothed. Inviſible to the naked eye. Found in water.

CALYCINA, in *Entomology*, a ſpecies of ARANEA, the abdomen of which is globoſe, and of a pale, yellowiſh colour. The inſect is thus deſcribed by Linnæus in his Fauna Suecica, as a Swediſh ſpecies. Scopoli calls it aranea Kleynii. This kind of ſpider ſecretes itſelf in the calyces of flowers from which the corolla has fallen, and faſtens on the flies that are tempted to the calyces in ſearch of the nectareous juices.

CALYCISTÆ, in *Botany*, a name given by Linnæus to thoſe botaniſts who have arranged plants from a regard chiefly or ſolely to their calyx. Magnol and Linnæus himſelf are the only authors mentioned who have attempted this method.

CALYCLE, a term invented by Vaillant to expreſs a ſeries of leaves ſurrounding the baſe of the calyx, generally ſhorter, of a different ſhape, and making a kind of double calyx; as in crepis, dianthus, malva, &c. Linnæus in his Philoſophia Botanica calls ſuch a calyx auctus; but in his practical works he is by no means uniform in his manner of expreſſing this circumſtance. In the Syſtema Naturæ, he deſcribes the calyx of crepis and other kindred genera as calycled; but in the Genera Plantarum he ſtiles it ſometimes auctus and ſometimes duplex or double. This latter term he applies to the calyx of malva, &c. That of dianthus he calls ſcaly. The term is alſo uſed by Linnæus to denote the ſmall permanent perianth which crowns the ſeed of ſcabioſa, arctotis, and ſome other genera, and is ſuppoſed, like the down attached to the ſeed of moſt ſyngeneſious plants, to facilitate its diſperſion. According to Gærtner, a ſeed is calycled when its cruſt is extended above its vertex, ſo as to form a one-leafed cup: it is either entire as in tanacetum, pyrethrum, dipſacus, &c. or halved as in melampodium and a few others. If there be more than one leaf it is conſidered by him as a different kind of pappus which he calls chaffy. The term calycle is therefore employed by him leſs extenſively than it is by Linnæus. See his general Introduction, p. 126.

CALYCOPTERIS, a generic name given to a ſhrub figured by La Marck in his Illuſtrations, which belongs to decandria monogynia of the Linnæan ſyſtem. But there is no article under that name in the alphabetical part of the Encyclopedie; and as the letter-preſs of the Illuſtrations is not completed, we are not able to determine its proper generic character, nor of what country it is a native.

CALYDERMUS, (from καλυξ, *calyx*, and δερμα, a *ſkin or thin rind*) a genus formed by the authors of the Flora Peruvenſis for the atropa phyſaloides of Linnæus, which differs from the other ſpecies in having a dry five celled berry, and a calyx with arrow-heart-ſhaped diviſions, covering the fruit.

CALYDNA INSULA, in *Ancient Geography*, a ſingle iſland according to Steph. Byz. and CALYDNÆ *Inſulæ*, a group of iſlands, according to Homer, who ſeems to place them near the iſland of Rhodes. Some have thought that by this general appellation the poet deſigned to expreſs the Sporades. Strabo, in ſpeaking of their honey, places them near Tenedos; and M. d'Anville ſuppoſes, that they are two rocks, which are ſtill found, one before and the other to the right of the port of Tenedos.

CALYDON, a city of Ætolia, pleaſantly and commodiouſly ſeated on the river Evenus, which paſſed through it. This city, which ſeems to have continued for ſome time the reſidence of the ancient Ætolian kings, was built by Calydon, the ſon of Ætolus, from whence the kingdom was called Calydonia, though it afterwards reſumed its ancient appellation. Hercules came to this city after he had left Peloponneſus; and though he had a numerous ſpurious brood, ſcattered over all Greece, yet, deſirous of legitimate iſſue, he is ſaid to have married Dejanira, the daughter of Œneus, king of the country, and father to Meleager; and with a view of ingratiating himſelf with the Ætolians, to have turned the current of the river Achelous, or to have made ſuch improvements in its channel, as to have given riſe to the fable of his having vanquiſhed it in ſingle combat. Calydon was ſituated near the foreſt of that name, where Meleager, accompanied by the nobleſt youths of Greece, ſlew the famed Calydonian boar. This fierce and monſtrous animal had done ſo much miſchief in the neighbourhood, that Meleager, king of the country, who kept his court at Calydon, was forced to call to his aſſiſtance a great number of the moſt diſtinguiſhed perſons of Greece in order to deſtroy it. The chief of theſe were Theſeus, Telamon, Peleus, Pollux, and Iolaus, all of them the faithful companions of Hercules, beſides a number of other heroes. To theſe we may add the famous Arcadian princeſs Atalanta, who behaved with ſuch uncommon courage and intrepidity upon this occaſion, that Meleager became enamoured with her, and married her. If we may credit Pauſanias, (Arcad. cap. 46.) one of the tuſks of this boar, which was preſerved in the temple of Bacchus, in the imperial gardens, was above a yard long, and therefore his ſize muſt have been very great. Some imperial Greek medals were ſtruck in the city of Calydon.

CALYMERE *Point*, in *Geography*, lies on the ſouthern extremity of the eaſt coaſt of the Carnatic country, in Hindooſtan, near Negapatam. N. lat. 10° 20′. E. long. 79° 54′ 30″.

CALYMNA, in *Ancient Geography*, an iſland of the Mediterranean ſea, upon the coaſt of Aſia, before Carpathum, according to Pliny. Ovid ſays, that it produced abundance of honey. It was one of the Sporades, S.W. of Leros, and N.W. of Cos. See Calamo.

CALYNDA. See Calinda.

CALYPARIS, *Fiume Caſſibili*, a ſmall river of Sicily, on the eaſtern coaſt.

CALYPLECTUS, in *Botany*, (from καλυξ, *calyx*, and πλεκτος, *plaited* or *folded*.) Flor. Peruv. Pl. 13. Claſs and order, *icoſandria monogynia*.

Gen. Ch. *Cal.* perianth bell ſhaped, leathery, caducous, with from ten to twelve plaits, and from ten to twelve teeth. *Cor.* petals from ten to twelve, attached to the folds of the calyx. *Stamens* about thirty. *Piſt.* germ ſuperior, globular, ſtriated; ſtigma ſimple. *Peric.* capſule globular, one-celled, longitudinally ſtriated in its upper part, opening irregularly. *Seeds* numerous, flat, membranous.

CALYPSO, in *Entomology*, a ſpecies of Papilio, (Dan. Cand.) ſo named by Fabricius in his *Species Inſectorum*, and by other writers. This butterfly is ſpecifically diſtinguiſhed by having the wings roundiſh; dot, and tip of the anterior pair black; poſterior ones yellowiſh beneath, and the margin dotted with black. Inhabits Sierra Leona.

Calypso, in *Fabulous Hiſtory*, the daughter of Oceanus and Thetis, or, according to Homer, the daughter of Atlas, who reigned over the iſland of Ogygia in the Ionian Sea; hence called the "Iſland of Calypſo." Here ſhe received Ulyſſes on his return from the Trojan expedition, and detained him ſeven years, offering to make him immortal if he eſpouſed her. But Ulyſſes, retaining in recollection his beloved Penelope, preferred a reſidence in the iſle of Ithaca, to all the advantages which Calypſo propoſed, and took his leave of the goddeſs, though not without regret. The name of Calypſo is derived from καλυπτειν, to conceal. Many different iſlands, very remote from one another, have been aſſigned to Calypſo; among which, beſides Ogygia, are Aea, and that which bears her name before Puzzuoli.

CALYPTRA, in *Botany*, (καλυπτρα, *a veil*, from καλυπτω, *to cover*,) a term uſed by old authors for that kind of ſeed covering, which Linnæus calls arillus; but afterwards transferred by Dillenius and others to that fugacious conical covering which inveſts the capſules of moſſes before they arrive at maturity. Linnæus, who miſtook the capſule for an anther, conſidered it as a ſpecies of calyx. Hedwig at firſt regarded it as the corolla, but was afterwards convinced that it is properly part of the piſtil, and that its firſt office is to ſtrengthen the attachment of the ſtyle to the germ. But as, from his own deſcription, in its early ſtate it inveſts the eſſential parts of the fructification, it is, as Linnæus made it, properly a ſpecies of calyx. When the germ becomes enlarged, the calyptra is torn all round from the baſe of the receptacle, and carried up by the capſule.

CALYPTRANTHES, from καλυπτρα, *a veil*, and ανθος, *a flower*,) Willdenow, 974. Schreb. 845. Swartz. Prod. 79. Claſs and order, *icoſandria monogynia*. Nat. Ord. *Myrti*.

Gen. Char. *Cal.* perianth one-leafed, bell-ſhaped, truncate, without teeth, or very ſlightly four-toothed, ſuperior, permanent; covered before the time of flowering with a round, concave, deciduous operculum or lid. *Cor.* none. *Stam.* filaments numerous, capillary, inſerted within the rim of the calyx; anthers roundiſh, double, ſmall. *Piſt.* germ roundiſh, faſtened to the bottom of the calyx: ſtyle, ſimple, thread-ſhaped, inflexed, the length of the ſtamens; ſtigma obtuſe. *Peric.* berry globular or oblong, crowned with the calyx. *Seeds* from one to four, ſomewhat angular.

Eſſ. Ch. *Calyx* ſuperior, truncate, covered till the ſtamens and piſtil become mature, with an entire deciduous lid. *Corolla* none. *Berry* one-celled. *Seeds* from one to four. Obſ. It differs from Eucalyptus in having a berry, not a capſule.

Species, 1. C. *chytraculia*, Willd. Swartz. Prod. 79. Fl. ind. occid. 2. p. 921. (Myrtus Chytraculia, Linn. Sp. Chytraculia, Brown Jam. 239. tab. 37. fig. 2.) "Peduncles terminal, panicled, trichotomous, downy; leaves egg-ſhaped, attenuated at the top." A tree. *Leaves* ſmooth, oppoſite. *Lid* faſtened to the calyx laterally, but it afterwards turns back, and then the filaments come out, which before had been twiſted and concealed. It is reckoned an excellent timber wood, but ſeldom exceeds 14 or 15 inches in diameter. A native of Jamaica, where it is called baſtard-green-heart. 2. C. *zuzygium*, Willd. Swartz. Prod. 79. Fl. ind. occ. 2. p. 919. (Myrtus zuzygium, Sp. Pl. Zuzygium, Brown. Jam. 240. tab. 7. fig. 2.) "Peduncles axillary, trichotomous, ſpreading; leaves egg-ſhaped, obtuſe; branches dichotomous." A buſhy ſhrub, 10 or 12 feet high. *Style* longer than the ſtamens; ſtigma acute. *Berries* black. *Seeds* four, ſmooth, ſlightly angular, one or two only generally coming to maturity. A native of Jamaica. This and the preceding were introduced into England in 1778 by Dr. Thomas Clark. 3. C. *rigida*, Willd. Swartz. Prod. 80. Fl. ind. occ. 2. p. 923. "Peduncles ſolitary, about three-flowered: leaves egg ſhaped, acute, convex, veinleſs, rigid." A ſhrub. A native of Jamaica. 4. C. *guineenſis*, Willd. "Peduncles axillary and terminal, in corymbs; leaves oblong, attenuated at the top and bottom, reticulated." A ſhrub. *Leaves* oppoſite, entire, ſhining on their upper ſurface. *Corymbs* divaricated; peduncles two-flowered. A native of Guinea.

Obſ. Profeſſor Martyn has adopted the idea of Schreber, in conſidering the Jambolifera of Linnæus and the Calyptranthes of Swartz as one genus, and has accordingly added the Jambolifera pedunculata of Linnæus and the J. odorata and reſinoſa of Loureiro. Willdenow concurs with him, and has alſo adopted into this genus Eugenia caryophyllifolia of La Marck, quoting Myrtus cumini of Linnæus as a ſynonym. But as all theſe plants are expreſsly ſaid to be furniſhed with petals, and as the firſt three have only eight ſtamens, they cannot belong to Calyptranthes, while its generic characters remain as they now ſtand. The genus Jambolifera was formed by Linnæus for a ſingle ſpecies, to which he attributed only eight ſtamens, and which he ſuppoſed to be the ſame as the Jambolana of Rumphius, and the Caryophyllus tanga of Plukenet; but La Marck aſſures us that he has in his Herbarium two ſpecies, one of which is inconteſtibly the plant of Rumphius, and the other that of Plukenet, which Linnæus erroneouſly ſuppoſed to be one and the ſame, both which have many ſtamens. Gærtner alſo, who has continued the genus, deſcribes it as having many ſtamens, and ſuppoſes that Linnæus formed his generic character from an incomplete ſpecimen. The two new ſpecies added by Loureiro are indeed ſtated to have only eight ſtamens; but if they agree with the original ſpecies of Linnæus in all their other characters, a difference merely in number will not warrant their ſeparation. They may all be properly placed under Eugenia, which, as Dr. Smith has obſerved (Linn. Tranſ. v. 3. p. 281.), will include alſo Gærtner's Syzygium; but in that caſe we muſt attribute to the genus an indefinite number of ſtamens from eight to forty or more.

CALYTRIPLEX, in *Botany* (ſo called from its treble calyx). Flora Peruv. Pl. 19. Claſs and order, *didynamia angioſpermia*.

Gen. Ch. *Calyx* treble, permanent; outer one conſiſting of two awl-ſhaped leaflets; middle one with three egg-ſhaped, acute diviſions; inner one of two lanceolate leaflets. *Cor.* irregular; tube ſhort; border with five nearly round ſegments; the two upper ones larger. *Stam.* four. *Piſt.* germ ſuperior, compreſſed; ſtyle thread-ſhaped, declining, the length of the ſtamens; ſtigma capitate. *Peric.* capſule egg-ſhaped, two-celled, two-valved. *Seeds* numerous, ſmall, furrowed, ſtriated; receptacle fixed to the valves.

Eſſ. Ch. *Calyx* treble. An herbaceous plant, native of Peru.

CALYX, or Calix, in a general ſenſe, denotes a cup. See Chalice.

Calyx, in *Ancient Aqueducts*, denoted a brazen module or cup, put over a head or caſtellum, to which pipes were fitted.

Calyx, in *Botany*, καλυξ, *a covering*, from καλυπτω. The word is uſed by Greek writers for a roſe bud, in which the proper flower or corolla of modern botaniſts is not opened, but lies concealed under an envelope. It is thus explained by Suidas, καλυξ, ανθος ῥοδου μεμυκος: the flower of the roſe ſhut up. And again, καλυκας, συριγγας, ῥοδα κεκαλυμμενα, which clearly points out the etymology. Heſychius, long before him, had given the ſame general idea. Καλυξ, το ανθος του ῥοδου, το μη εκπετασθεν: the flower of the roſe not expanded. Aquila, ſtill earlier, in his verſion of Iſaiah, ch. xxxv. 1. had tranſlated the Hebrew word כחבצלת, καλυξ, which, Jerom ſays, is a better rendering than κρινον of the Septuagint, or lilium of the Vulgate. Florebit ut lilium, ſive ut ſignificantius expreſſit Aquila, ως καλυξ, quam nos tumentem roſam, & necdum foliis dilatatis poſſumus dicere. It ſhall flouriſh as a lily, or as Aquila more ſignificantly expreſſes it, as a calyx, or ſwelling roſe, whoſe flower-leaves are not yet expanded.

By theſe writers the bud itſelf, in its entire ſubſtance, is called a calyx: though the admiſſion of συριγγας, by Suidas, as a ſynonym of καλυκας, may ſeem to imply only the envelope, to which the term has been applied by modern botaniſts. According to Ray, it is the caſe (folliculus) in which, firſt the flower, and afterwards the ſeed of herbaceous plants, and the fruit of trees is encloſed: but the latter part of the definition muſt certainly be received, with numerous exceptions.

Through a ſimilarity in ſound, and in many caſes, a reſemblance in form, it was very early confounded with calix, a cup; but as it is almoſt univerſally ſpelt with a y in the laſt ſyllable, its derivation and proper meaning cannot be doubted. It is the envelope caſe or ſheath in which the tender flower lies for a time concealed, and by which it is, in moſt caſes, afterwards ſupported and protected.

Linnæus has followed Cæſalpinus in conſidering the calyx as a prolongation of the cortex, or outer bark of the plant; and has diſtinguiſhed it into ſeven different kinds: 1. A perianth, contiguous to the other parts of the fructification. This is frequently called empalement or flower-cup by Engliſh writers, and to it, as profeſſor Martyn well obſerves, ſhould the term, cup, if admitted at all, be confined. 2. An involucre, remote from the flower, as in many umbelliferous plants. 3. An amentum or catkin, from a common, chaffy, gemmaceous receptacle. 4. A ſpathe burſting longitudinally. 5. A glume, formed of valves embracing the ſeed. 6. A calyptra, covering the capſules of moſſes like a hood. 7. A volva, a membranaceous covering to the fructification of the fungi. See thoſe words. The involucre is rather a number of bractes; and the amentum, a ſpecies of infloreſcence.

CALYXHYMENIA. Ortega Decad. Bot. Flor. Peruv. Pl. 75. Claſs and order, *triandria monogynia.*

Gen. Ch. *Cal.* with five diviſions. *Cor.* bell-ſhaped; border with five plaited diviſions. *Stam.* three. *Piſt.* germ ſuperior: ſtyle curved; ſtigma capitate. *Peric.* drupe egg-ſhaped, one-ſeeded, encloſed in the calyx.

Four ſpecies of this genus are figured in the Flora Peruvienſis, which are all herbaceous plants with jointed ſtems, and oppoſite, petioled, egg-ſhaped, entire leaves. They are nearly allied to mirabilis: and according to Boſc, from whom we are obliged, not having the Flora Peruvienſis at hand, to tranſlate this article, and whoſe information, as uſual, is mutilated and unſatisfactory; there ought to be added to them the mirabilis viſcoſus of Cavanilles, which has been formed into a diſtinct genus by Tuna, under the name of Vitmania, and by l'Heretier, under that of Oxybaphus.

CALZADA, in *Geography*, a town of Spain, in Old Caſtile, once the ſee of a biſhop, united to that of Calahorra; 40 miles W. of Calahorra. N. lat. 42° 12′. W. long. 2° 47′.

CAM, or Grant, a river of England, which paſſes by Cambridge, and joins the Ouſe, three miles ſouth from Ely.

Cam, one of the ſmaller Virgin iſlands in the Weſt Indies, N. lat. 18° 20′. W. long. 63° 25′.

Cam's *Bank*, lies on the coaſt of Flanders, W. of the Broer's bank, within which a ſhip may run through and ride by the land in all winds.

CAMA, or Cameia, in *Ancient Geography*, a town of Aſia in Armenia; the chief city of the Manichees.

CAMAC, Porto, in *Geography*, lies on the north ſide of the iſland of Candia, to the S. of the Archipelago iſlands, and on the E. ſide of Cape St. John, having ſeveral iſlands in its mouth.

CAMACÆ, and Camæ, in *Ancient Geography*, the denomination of diſtinct people, claſſed by Pliny among the Scythian nations on this ſide of mount Imaus.

CAMÆA, in *Natural Hiſtory*, the name of a genus of the ſemipellucid gems, the characters of which are theſe: they are obſcurely tranſparent ſtones approaching to the onyx ſtructure, being compoſed of zones, and formed on a cryſtalline baſis, but having their zones very broad and thick, and laid alternately on one another with no other matter between them.

Of this genus we have four known ſpecies:

1. The dull-looking onyx, with broad black and white zones. This is the camæa of the moderns, and the Arabian onyx. It is found in Egypt, Arabia, Perſia, and the Eaſt Indies. 2. The dull broad-zoned green and white camæa, or the jaſpicamæo of the Italians: found in the Eaſt Indies, and in ſome parts of America. 3. The hard camæa, with broad white and cheſnut-coloured veins. 4. The hard camæa with bluiſh, white, and fleſh-coloured broad veins, being the ſardonyx of Pliny's time, brought only from the Eaſt Indies.

CAMAHA, in the *Materia Medica*, a name given by Avicenna and others to the large truffles found in the deſarts of Numidia, and many other parts of Africa, in great abundance. Theſe are white on the outſide; the modern Africans call them *terſon*, and are very fond of them; they eat them ſtewed with milk, water, and ſpices, and account them wholeſome and nutritive.

CAMAIEU, or Camayeu, in *Mineralogy*, a word uſed to expreſs a peculiar ſort of onyx: alſo by ſome to expreſs a ſtone, whereon are found various figures, and repreſentations of landſcapes, &c. formed by a kind of *luſus naturæ;* ſo as to exhibit pictures without painting. The word comes from *camehuia*, a name the Orientals give to the onyx, when they find, in preparing it, another colour; thus expreſſing *a ſecond ſtone.* It is of theſe camaieux Pliny is to be underſtood when he ſpeaks of the manifold picture of gems, and the party-coloured ſpots of precious ſtones: *Gemmarum pictura tam multiplex, lapidumque tam diſcolores maculæ.* Plin. Hiſt. Nat. lib. ii. c. 93.

Camaieu is alſo applied by others to thoſe precious ſtones, as onyxes, cornelians, and agats, whereon the lapidaries employ their art to aid nature, and perfect thoſe repreſentations. See Camæa.

Camaieu is alſo frequently applied to any kind of gem, whereon figures may be engraven either indentedly, or in relievo. In this ſenſe the lapidaries of Paris are called in their ſtatutes *cutters of camayeux.* A ſociety of learned men at Florence undertook to procure all the *cameos* or *camayeux,* and intaglios in the great duke's gallery, to be engraven; and began to draw the heads of divers emperors in *cameos.*

Camaieu is alſo uſed for a painting, wherein there is only one colour; and where the lights and ſhadows are of gold, wrought on a golden or azure ground. When the ground is yellow, the French call it *cirage;* when grey, *griſaile.* This kind of work is chiefly uſed to repreſent baſſo relievos: the Greeks call pieces of this ſort μονοχρωματα.

CAMAIL, in *Ornithology,* ſynonymous with cravatte, according to Buffon, and other French writers, the black-faced tanager of Latham, and tanagra atra of Gmelin. This is a bird that inhabits Guiana, is about ſeven inches long, and of a cinereous colour, with the face, chin, and throat of the male black; and of the female, brown.

CAMAINES, Grand, in *Geography,* a large iſland, with low and ſmooth land, and trees on the top, about 46 or 48 leagues W.N.W. from the weſt point of Jamaica. The iſland is well ſtored with turtle.

Camaines, *Little,* are two iſlands, the weſternmoſt of which is called Camin Brack. They lie E.N.E. about 20 leagues from the Grand Camaines. The people of Jamaica catch many turtles here.

CAMALA, or Gamala, in *Ancient Geography,* a town of Spain, 24 miles from Lacobriga. Anton. Itin.

Camala, in *Geography,* a river that lies on the E. coaſt of Africa, within the long reef or ſand bank from Cape Corientes to the Barras Vermulas, an extent of at leaſt 400 miles.

CAMALDULIANS, Camaldunians, or Camaldolites, in *Eccleſiaſtical Hiſtory,* an order of religious, founded by Romuald, an Italian fanatic, in 1023, in the horrible deſart of Camaldoli, otherwiſe called Campo-Malduli, ſituate in the ſtate of Florence, on the Appenines.

Their rule is that of St. Benedict; and their houſes, by the ſtatutes, are never to be leſs than five leagues from cities. The Camaldulians have not borne that title from the beginning of their order; till the cloſe of the eleventh century they were called *Romualdins,* from the name of their founder. Till that time *Camaldulian* was a particular name for thoſe of the deſart Camaldoli; and D. Grandi obſerves, was not given to the whole order, in regard it was in this monaſtery that the order commenced, but becauſe the regulation was beſt maintained here.

Guido Grandi, mathematician of the great duke of Tuſcany, and a monk of this order, has publiſhed *Camaldulian* Diſſertations on the origin and eſtabliſhment of it.

The Camaldolites were diſtinguiſhed into two claſſes, of which the one were Coenobites, and the other Eremites.

CAMALODUNUM, Camudolanum, or Camulodunum, in *Ancient Geography,* a town of Albion, belonging to the Trinonantes, or Trinovantes. This town is placed by ſome of our antiquaries, as Talbot, Stillingfleet, and Baxter, at Colcheſter; but by Camden, Horſley, and others, more conformably to the itinerary of Antonine, and with greater probability, at Malden. Dr. Gale earneſtly contends for Walden. This was the capital of the powerful Britiſh king Cunobeline, and the firſt Roman colony in the iſland. Soon after the conqueſt of this part of the country by the Romans, a colony, conſiſting chiefly of the veterans of the 14th legion, was planted at Camudolanum by the emperor Claudius, A.D. 52; and by their wealth and induſtry, it became a place of great magnificence. But its proſperity was of no long duration; for it was quite deſtroyed by the Britons in their great revolt, A. D. 61. The theatre, the temple of Claudius, and the ſeveral villas in the neighbourhood, belonging to the Roman commanders, were ſo totally demoliſhed by the incenſed Britons, who beheld the colony as a ſeat of ſlavery, that our learned antiquarians have been much divided about the place where it was ſituated.

CAMAMU, Rio, in *Geography,* a large river of the Brazils, about 25 leagues to the ſouthward of Bahia; on the banks of which are ſeveral ſmall towns and villages, which are the beſt inhabited of any part of the Brazils. There are not leſs than 3 or 400 ſmall veſſels employed by the inhabitants to convey their commodities to Bahia and Rio de Janeiro. The Jeſuits formerly carried on a great traffic with this place, and ſent a large frigate loaded from theſe parts to Paraguay. The ſource of this river is in the centre of the gold mines.

CAMANA, or Camane, in *Ancient Geography,* a town of India, on this ſide of the Ganges, in the gulf of Barigazeni; ſuppoſed by ſome to be ſituate in the place of the preſent Cambay.

Camana, in *Geography,* a town of South America, and capital of the juriſdiction of Camana in the dioceſe of Arequipa, in Peru, ſituate on a river of the ſame name, near the South Pacific ocean. The juriſdiction is large, and contains many deſarts, eſpecially along the coaſt. Eaſtward it extends to the borders of the Cordilleras, ſo that the temperature of ſome parts is nearly the ſame with that of Arequipa, while others are cold; and both produce ſimilar grain and fruits. Its principal trade conſiſts in aſſes. It has ſilver mines near the mountains; but they are not worked. The town is 70 miles from Arequipa.

CAMANAR, a town that lies behind a ridge of rocks on the S. ſide of Gallipoli, on the Aſiatic ſhore of the paſſage towards Conſtantinople and the Black ſea.

CAMANBAYA, in *Botany* (Margraave and Petiver.) See Tillandsia *uſneoides.*

CAMANTIUM, in *Ancient Geography,* the name of a town of Aſia Minor, being, according to Athenæus, one of the ſeven towns which Cyrus conferred on his friend Clearchus.

CAMANUSALI, or Alcana Musali, in *Biography,* a phyſician and ſurgeon in much eſtimation, who practiſed at Bagdad about the middle of the 13th century. He wrote a treatiſe on the diſeaſes of the eyes, in which he profeſſes to have given all that could be found in the beſt Arabian, Hebrew, and Chaldean writers on the ſubject; particularly he deſcribes the method of curing cataracts by the uſe of ſetons. His work was tranſlated from the Arabic into Latin, and publiſhed at Venice in folio with the Chirurgi de Gui de Canliac, who frequently cites him. The title of the tract is "De Paſſionibus Oculorum Liber." It has been ſeveral times reprinted. Haller. Bib. Chir.

CAMARA, in *Botany* (Plumier, Dillenius, La Marck, Boſc.) See Lantana.

Camara, in *Ancient Geography,* a town of the iſland of

Crete, ſituate in the N. E. part of the iſland. Steph. Byz. and Ptolemy.—Alſo, a trading town of India, on this ſide of the Ganges. Arrian.

CAMARACUM, now *Cambray*, in *Ancient Geography*, a town of Belgic Gaul, thought by ſome to be the capital of the Nervii; but M. d'Anville thought this capital to have been *Bagacum*. The two moſt ancient works which mention this city are the Itinerary of Antonine and the Theodoſian table, whence it may be inferred, that if it exiſted before their time, it muſt have been an inconſiderable place.

CAMARADE, a companion, aſſociate, or friend. It is a term in uſe among ſoldiers to ſignify a perſon that is in the ſame tent, room, or chamber with them. It is alſo a name given to a battery which fires at the ſame time with another or more batteries, at one and the ſame ſpot. Thus, for inſtance, in battering one of the curtains of a work, three batteries are opened againſt it ſometimes at once, one of them a little advanced, or in the front, as it were, and another on each ſide of it called *camarade*.

CAMARAN, or Kamaran, in *Geography*, an iſland in the Red Sea, about 30 miles in length, and 20 in breadth, diſtant about 8 miles from the coaſt of Arabia. The principal employment of the inhabitants is fiſhing, eſpecially for pearls and coral. This iſland is diſtinguiſhed by a white houſe, or fortreſs, on the weſt end of it, where excellent water may be procured, but no proviſions, or merely ſuch as are very bad. N. lat. 15° 39′, E, long. 42° 22′.

CAMARASA, a town of Spain, in Catalonia, on the river Segro, about 9 leagues above Balaguer.

CAMARATA, in *Ancient Geography*, a town of Africa, in Mauritania Cæſarienſis, between Portus Sigenſis and Flumen Salſum. Anton. Itin.

CAMARES, in *Geography*, a town of France, in the department of Aveyron, and chief place of a canton in the diſtrict of St. Afrique; the place contains 1638, and the canton 8128 inhabitants; the territory comprehends $327\frac{1}{2}$ kiliometres and 14 communes.

CAMARET, a town of France, in the department of Finiſterre, ſituate in a bay to which it gives name; 8 miles S. of Breſt.

CAMARGUE, an iſland, or cluſter of iſlands, in the mouth of the Rhone in France, ſeparated by canals and fortified; the whole extent contains about 27 ſquare leagues, and is divided into eight pariſhes; the land is very fertile, but the air inſalubrious.

CAMARICA, a town of Spain, placed by Ptolemy in Cantabria.

CAMARINA, was formerly one of the moſt wealthy cities in Sicily. It ſtood between the rivers Oanus and Hipparis, now the Fraſcolari and Camarana, near the coaſt. Nothing now remains of this city but ſome ruins, and the name of Camarina, which is given by the natives to a tower and a neighbouring marſh. Camarina was founded in the 45th olympiad, deſtroyed by the Syracuſans in the 57th, and rebuilt between the 82d and 85th olympiad. After many revolutions, it was brought under ſubjection by the Romans, in the firſt Punic war.

An old tradition reports, that Camarina was built of the clay or mud which the river Hipparis carried along with it and depoſited in a lake of the ſame name. A paſſage in Pindar (Olymp. v. 29.) ſeems to confirm this account, which Ariſtarchus quotes in explaining it; and according to Bochart (Chanaan, i. 29. p. 605.), ſome proof is afforded by the name Camarina, as "Chamar," or "Chomar," ſignifies ſealing-clay. However, the old commentators on Pindar have not adopted this explanation. Didymus (ſee Oxford edition of Pindar, 1697, fol. p. 53, &c.), and others aſſert, that the poet alludes to the wood for building the city being conveyed in floats on the river Hipparis.

The *Palus Camarina* was a marſh or lake, ſituate near the city, which in time of drought yielded a ſtench that produced a peſtilence; and therefore the inhabitants conſulted an oracle, whether they ſhould not drain it. Although the oracle diſſuaded them, they drained it, and opened a way for their enemies to come and plunder their city. Hence aroſe the proverb "Ne moveas Camarinam," not to remove one evil in order to bring on a greater. This lake is now called "Lago di Camarana;" it is of a triangular form, and ſituate under the walls of Camarina.

Camarina, in *Geography*, a town of Spain in Arragon; 4 miles S. of Teruel.

CAMARINAS, a town of Spain, near the ſea-coaſt of Galicia; 25 miles W.N.W of Galicia.

CAMARINES, the moſt ſouthern province of the iſland of Luçon, one of the Philippines, in which are Bondo, Paſſacao, Ibalon, the metropolis of the government of Catanduanes, Bulan, Serſocon, or Bagatao, where the king's ſhips are built, and Albai, a large bay without the ſtrait, in which there is a high burning mountain, ſeen at a great diſtance by the ſhips coming from New Spain, and poſſeſſing ſome ſprings of hot water. Beyond Albai, towards the eaſt, is the cape of Buyſaygay; and coaſting from hence weſtward, we arrive at the river Bicor, which flows from a lake and runs by the city Caceres, the capital of the province. See Caceres.

CAMARINUM, or Camerinum, now Camerino, in *Ancient Geography*, a town of Italy in Umbria, on the confines of Picenum, and at ſome diſtance eaſt of Nuceria. It was probably powerful, as the Romans, A. U. C. 144, ſolicited an alliance with it; they afterwards eſtabliſhed a colony there. See Camerino. Strabo and Ptolemy.

CAMARIOCA, in *Geography*, a town of the iſland of Cuba; 15 miles E. of Havanna.

CAMARIPUGUACU, in *Ichthyology*, the name under which Marcgraave, and various other old writers, deſcribe the Braſilian ſpecies of Clupea, called by Brouſſonet and Gmelin Cyprinoides: ſee that article.

CAMARITÆ, in *Ancient Geography*, a people who inhabited the coaſt of the Caſpian ſea, on the iſthmus which ſeparates that ſea from the Euxine. Dionyſius Periegetes ſays, that they formed a numerous nation; and that they hoſpitably entertained Bacchus in his return from the Indian war.

CAMAROCENSIUM Civitas. See Camaracum.

CAMARON, or Cameron, *Cape*, in *Geography*, a headland of North America, in the gulf of Honduras. N. lat. 15° 35′. W. long. 83° 29′.

CAMARONES, a town of the iſland of Cuba; 75 miles S.E. of Havanna.

Camarones, or Jamour, a river of Africa, which riſes in the country of Biafra, and paſſing through the territory of the Calbongos, diſcharges itſelf into the Atlantic in the gulf of Guinea. N. lat. 3° 28′. E. long. 11° 30′.

Camarones, *Cape*, is a headland at the mouth of this river.

Camarones, a river of South America, forming a bay in the Atlantic, about 30 leagues N. from Port Deſire, or Deſeado, and 20 from cape Blanco, which lies between them. S. lat. about 44° 30′. W. long. 66° 20′.

Camarones, a river of South America, on the coaſt of Peru, which runs into the Pacific ocean, about 36 miles S. of Arica. S. lat. about 19° 20′. It is 8 leagues N. from Piſagua river. There is a point or cape of the ſame name, rendered white by the dung of the cormorants, that reſort to it in vaſt numbers. The iſland adjoining to it is ſometimes called Camaron, though its proper name is Guano.

CAMAROSIS, from καμαροω, *I arch over*, in *Architecture*, denotes an elevation with an arch or vault.

Camarosis, among *Phyſicians*, denotes a fracture of a bone, wherein the two broken ends riſe and form a kind of *camera*, or arch.

This is alſo called *camaroma*, and by modern Latin writers *cameratio*, ſometimes *fornicatio*.—It is commonly reſtrained to fractures in the ſkull.

CAMARRA, in *Geography*, a river on the N. coaſt of South America, W. from the river Maya. The intervening ſpace along the ſhore is covered with trees.

CAMARSEN, a town of Germany, in the Tyroleſe; 30 miles W. of Bolzano.

CAMASSEI, Andrea, in *Biography*, a painter of hiſtory and landſcape, was born at Bevagna, acquired the principles of deſign and colouring from Domenichino, afterwards ſtudied in the ſchool of Andrea Sacchi, and became eminent in his profeſſion. He was employed at St. Peter's at Rome, and at St. John Lateran; and his works were much admired for ſweetneſs of colouring, elegance of deſign, and delicacy of pencil. He died in 1648, as Sandrart ſays, in the bloom of life, and at a period when his reputation was daily advancing. His "Battle of Conſtantine and Maxentius," and "Triumph of Conſtantine" at St. John Lateran, are noble and grand compoſitions, evincing his powers of invention and correctneſs of execution. The picture of "Venus with the Graces," in the collection of the earl of Pembroke at Wilton, is aſcribed to Camaſſei. Pilkington.

CAMATULLICI, in *Ancient Geography*, a people of the Maritime Alps, on the ſea-coaſt S. W. of the Sueltri, placed by Pliny between Cithariſta and the Sueltri. Hardouin ſays, that they inhabited the dioceſe of Toulon.

CAMAX, in *Botany* (καμαξ, the prop of a vine, a ſtake, or pole). Schreb. gen. 365. Willden. 416. Ropourea, Aub. Guian. tab. 78. Juſſ. 421. La Marck Illuſt. Pl. 121. Claſs and order, *pentandria monogynia*.

Gen. Ch. *Cal.* perianth one-leafed, five-parted; ſegments roundiſh. *Cor.* one-petalled, wheel-ſhaped; tube very ſhort; border five-parted; ſegments roundiſh, hairy above. *Stam.* filaments five, inſerted into the corolla between the ſegments, hairy; anthers double. *Piſt.* germ ſuperior, roundiſh, hairy; ſtyle capillary; ſtigmas three or four, acute. *Peric.* berry egg-ſhaped, hairy, four-celled. *Seeds* numerous, bedded in a viſcous pulp.

Eſſ. Ch. *Calyx* five-parted. *Corolla* wheel-ſhaped. *Stigmas* three or four. *Berry* four-celled, many-ſeeded.

Sp. C. *fraxinea*. Willd. (Ropourea guianenſis, Aub. guian. 1. p. 198. tab. 78. La Marck Illuſt. Pl. 121.) A ſhrub, from 12 to 15 feet high. *Stems* three or four inches thick, ſimple, round, jointed. *Leaves* in whorls at each joint, declining, unequally winged; leaflets alternate, numerous, ſeſſile, egg-ſhaped, acuminate, entire, green on both ſides, from eight to ten inches long, and about three broad; midrib ſtrong, throwing out on each ſide alternate, ſimple, curved nerves, the intervals between which are occupied by very fine, zig-zag veins; each of the leaflets is furniſhed at its baſe with a ſmall ſpine. *Flowers* ſmall, of a ruſſet colour, axillary, numerous, nearly ſeſſile; hairs of the corolla and of the germ red. *Berry* yellow, about the ſize of a hen's egg, full of a ſweet pulp, which is eaten by the Creoles and natives of the country; one of the cells is often abortive, and as the others increaſe diſappears. A native of Guiana, where its branches are uſed by the negroes for wattling their huts. The Creoles call it Bois gaulette, and the Couſſaris, one of the aborigine nations, Aroupourou.

CAMB, or Kamp, in *Geography*, a river of Auſtria, which riſes on the frontiers of Bohemia, and diſcharges itſelf into the Danube.

CAMBADAS, a town of Spain, in Galicia, near the ſea-coaſt; 4 leagues W. of Ponte-Vedra.

CAMBADENA, in *Ancient Geography*, a country of Aſia; not far from Media. One of its principal towns was Baptana, ſeated on a mountain, in which were a column and ſtatue of Semiramis.

CAMBAHEE, in *Geography*, a river of America, which runs into the ſea near St. Helena's ſound, on the coaſt of South Carolina.

CAMBALA, in *Ancient Geography*, a place of Aſia, in the Greater Armenia, and in the Hyſperitide country, according to Strabo, who ſays that it had mines of gold.

CAMBALIDUS Mons, a mountain of Aſia, which, according to Pliny, was a branch of mount Caucaſus.

CAMBALU, a name formerly given to Pekin, the preſent capital of China. In 1307, it was erected by pope Clement V. into an archbiſhopric, which he conferred upon John de Monte Corvino, an Italian friar, who had been employed for many years in propagating the goſpel in that country. Upon his death in 1330, pope John XXII. ſent Nicolas of Bantra to fill the vacant ſee, and charged him with letters to the emperor of the Tartars, who was, at that time, in poſſeſſion of the Chineſe dominions.

CAMBAMBA, in *Geography*, a high mountain of Africa, giving name to the adjacent diſtrict, in the kingdom of Angola, on which is a mine of excellent ſilver. The Portugueſe have been for a long time maſters of it, and have built a ſtrong fortreſs; which, on account of its vicinity to the river Coanza, carries on a great commerce of ſlaves.

CAMBANA. See Cambona.

CAMBAT, a province of Abyſſinia, diſmembered from it by the Gallas. It occupies that diſtrict of Africa in the ſouthern part of Abyſſinia, which lies in about N. lat. 8°, and E. long. from about 37° to 38°. It is ſeparated from Gingiro on the weſt and ſouth-weſt, by the river Zebee; on the north it has the kingdom of Hadea, and other provinces of Abyſſinia; on the eaſt and ſouth-eaſt it has Buzamo and Alaba, and on the ſouth Makouko. This country is frequently haraſſed by the Gallas; and it is ſaid to pay ſome acknowledgments to the emperor of Abyſſinia, which are only voluntary. But little certain is known concerning it. It is inhabited by a mixture of Chriſtians, Mahometans, and Pagans; and abounds in various fruits.

CAMBAY, a large and beautiful city of Hindooſtan, ſituate near the head of the gulf of the ſame name, upon the north bank of the river Canari, called by ſome the Myhie. The city is twice as large as Surat, but not nearly ſo populous: it is defended by a ſtrong wall, about five miles in circumference; the ſtreets are large, and have gates at their entrances, which are ſhut in the night, and there are 12 gates to the city beſides thoſe of the ſtreets: the houſes are built of ſtone, brick, or marble; and here are three bazars, or public markets, and four public ciſterns, which are capable of ſupplying the whole town with water in times of the greateſt drought. This city is the port of Amedabad, from which it is diſtant about 56 road miles. Its trade is carried on by Mooriſh, Armenian, and Arabian merchants, with Perſia, Mocha, Diu, Acheen, Coromandel, and other places; and it was formerly very great in ſpice, ivory, ſilk, cotton cloths, and other commodities. But its commerce has declined, and is chiefly transferred to Surat, on account of the incommodiouſneſs of the harbour, which is obſtructed with ſand and mud, ſo that in the higheſt tides it has not more than ſeven fathoms of water, and the gulf is ſull of rocks. Cambay appears to be the Camanes of Ptolemy; although the gulf, which is now denominated from Cambay, had then its name from Barygaza, or the modern Baroach. It is diſtant 281 miles N. from Bombay; 1273 by Nagpour, and 1253 by Mundlah and Ougein nearly W. from Calcutta; 663 about S.W. from Delhi; and 998 N.W. from Madras. N. lat. 22° 16′ 45″. E. long. 72° 32′ 45″.

CAMBAYES, in *Commerce*, cotton cloths made at Bengal, Madras, and ſome other places on the coaſt of Coromandel. They are proper for the trade of Marſeilles, whither the Engliſh at Madras ſend great numbers of them. Many are alſo imported into Holland.

CAMBAZA, in *Geography*, a town of Japan, in the province of Ietſingo.

CAMBE, La, a town of France, in the deparment of Calvados, and diſtrict of Bayeux; four leagues W.N.W. of Bayeux.

CAMBELLO, a town of the iſland of Ceram, and principal market for cloves.

CAMBER-*beam*, in *Building*, a piece of timber cut archwiſe, or with an obtuſe angle in the middle, commonly uſed in platforms; as church-leads, and on other occaſions, where long and ſtrong beams are required. A camber-beam is much ſtronger than another of the ſame ſize; ſince being laid with the hollow ſide downwards, as they uſually are, it repreſents a kind of arch.

CAMBERED-*deck*, in *Ship-building*. See Deck.

CAMBERG, in *Geography*, a town of Germany, in the circle of the Lower Rhine, and Lower Electorate; 22 miles N. from Mentz, and 30 E. from Coblentz. It is ſituated in a prefecturate of the ſame name; and the circumjacent tract contains fine arable land, but principally yields a good culture of flax.

CAMBERNON, a town of France, in the department of the Chanael: one league N.E. from Coutances.

CAMBERT, in *Biography*, a French opera compoſer, previous to Lulli, has no place aſſigned him here as a great muſician; but on account of his being connected, in ſome ſmall degree, with the hiſtory of the opera at Paris, his name will frequently occur to our readers in peruſing accounts of the origin of the muſical drama in France. Cambert was the firſt who attempted to ſet an opera in the French language upon the Italian model, previous to the licence which he had obtained, being transferred to Lulli, who began his opera career by compoſing the muſic for the dances. It being generally known that our monarch, Charles II. was very fond of French muſic and the amuſements of Louis the fourteenth's court, Cambert, in loſing his privilege, came to London, and was appointed maſter of king Charles the ſecond's band. His opera of "Pomone," written by P. Perrin, ſeems to have been performed in 1672 at court, in its original language, as no record of it occurs in our dramatic writers; but, acording to Giles Jacob, his "Ariadne, or the Marriage of Bacchus," tranſlated into Engliſh, "was preſented by the academy of Muſic, at the theatre royal, in Covent-Garden, 1674, by the gentlemen of the Academy of Muſic." We know of no theatre royal in Covent-Garden at this time, nor do we meet with any mention of an Engliſh academy of muſic at this period. It is ſaid, in the "Hiſtoire de la Muſic," tom. i. that Cambert, who died in London in 1677, broke his heart on account of the bad ſucceſs of his operas in England.

CAMBETUM, in *Ancient Geography*, a town of Spain, placed by Ptolemy in the territory of the Lubenians, in the Tarragonenſis.

CAMBING, *Boorong Cambing*, or *Booring-volar*, in *Ornithology*, the name by which Marſden, in his hiſtory of Sumatra, diſtinguiſhes the gigantic crane, *ardea dubia* of Gmelin, a bird of vaſt ſize that inhabits alſo India and Africa. It is ſpecifically known by being of a glaucous colour above, beneath dirty white, and having the tail ſomewhat triangular. This is the *bargill* or *argill* of Ives.

Cambing, or *Kambing*, in *Ichthyology*, one of the ſynonyms of *chaetodon teira*, according to Renard and others. See Teira.

CAMBINI, in *Biography*, an Italian inſtrumental compoſer, poſſeſſed of genius and fire. He is ſaid by M. la Borde to be chiefly known to Dilettanti. We ſuppoſe the violin to be his inſtrument, of which he ſeems to know the finger-board well, and to write with fancy and facility.

CAMBIO, an Italian word which ſignifies *exchange*; commonly uſed in Provence, and in ſome other countries, particularly Holland.

CAMBIST, a name given in France to thoſe who trade in notes and bills of exchange. The word cambiſt, though a term of antiquity, is even now a technical word, of ſome uſe among merchants, traders, and bankers. Some derive it from the Latin cambium, or rather cambio.

CAMBIUM, in *Vegetable Anatomy*, is a name that has been very happily beſtowed by Duhamel and other phyſiologiſts upon the ſubſtance which is produced for the growth or repair of the vegetable body. The chief ſeat of the cambium in the dycotyledons, or thoſe plants with two ſeminal leaves, is between the bark and the wood. In order to obſerve it, we ſhould ſelect, in the full ſeaſon of vegetation, a branch of ſome tree, in which the bark is known to be eaſily ſeparable from the wood, ſuch as the oſier, when upon detaching a portion of the bark, its inner ſurface, and that of the wood correſponding to it, will be found covered with a quantity of fluid which poſſeſſes more tenacity than the common lymph or ſap, and reſembles mucilage or fluid jelly.

The cambium is generally reputed to be either an extravaſation from the ſurface of the wood, or that of the bark, but it is not determined from which of theſe parts it is derived, or whether they are not equally competent to produce it. Mirbel ſuppoſes that the cambium is furniſhed by the wood, and with apparent foundation, ſince in the monocotyledons it is depoſited around the ligneous fibres.

Grew and Duhamel did not allow this ſubſtance to be an extravaſated juice, but believed that it poſſeſſed organization and diſtinct parts, although they were ſo ſoft as to evade all means of detection. Without deciding upon this opinion, we muſt admit that the cambium is not a ſimple fluid, but muſt have received ſome modification to fit it for the important changes it is deſigned to undergo. As the ſeaſon advances, this ſubſtance (when ſituated under the bark,) acquires ſolidity and viſible organization, and is ultimately converted into the new layers of wood and bark, which are annually depoſited upon dycotyledons. See Bark, Cortical Layers, Liber, and Wood.

The gradual diſappearance of the pith in many trees depends upon the formation of the cambium, or organizing ſubſtance within the medullary canal. This produces an internal liber, which is by degrees transformed into wood, in the ſame manner as the external liber gives origin to the external woody layers, except that in the former, the increaſe is outwards, while in the latter, it is towards the center. See Pith, and Medullary Canal.

As the mode of growth in plants with one ſeminal leaf differs ſo materially from that of the dycotyledons, the cambium in them likewiſe holds a different ſituation. Inſtead of being depoſited near the ſurface of the plant, it ſurrounds the ligneous fibres which occupy the interior, where it is converted into the cellular and tubular texture ; the latter forms at firſt a very porous wood which inſenſibly contracts, elongates, and is transformed into perfect wood, during which proceſs it ſeparates from the parenchyma, and leaves a lacuna which is ſoon filled with new cambium. See Monocotyledon Wood.

All new formed parts, ſuch as buds, ſeeds, &c. may be ſaid to exiſt at one period as cambium ; even the hardeſt ſtone fruit, when firſt obſerved, is a tender vegetable jelly, in which no fibres, cells, or any diſtinction of parts, can be diſcovered.

When wounds are inflicted upon plants, their reunion is accompliſhed by means of the cambium, and from its organization ariſe the nodes or ſwellings, which are the conſequence of engrafting trees. If any injury to a vegetable be accompanied by deſtruction of parts, the reparation is commenced by a depoſition of cambium, and continued by repeated effuſions of the ſame ſubſtance until the reproduction is complete. See Wounds and Diseases *of plants*, and Ingrafting.

The analogy between the vegetable cambium and the coagulable lymph of animals is ſo palpable, that it is hardly neceſſary to point it out. Theſe ſubſtances equally afford the matrix in which organic ſtructure is begun, and conſtitute the moſt eſſential and important materials in the animal and vegetable ſyſtems.

CAMBLET, or Chamblet, in *Commerce*, a ſtuff ſometimes of wool, ſometimes ſilk, and ſometimes hair, eſpecially that of goats, with wool or ſilk : in ſome, the warp is ſilk and wool twiſted together, and the woof hair.

The true or oriental camblet is made of the pure hair of a ſort of goat, frequent about Angora, and which makes the riches of that city, all the inhabitants whereof are employed in the manufacture and commerce of camblets. It is certain we find mention in middle age writers of ſtuffs made of camel's hair, under the denominations of *cameletum* and *camelinum*, whence probably the origin of the term ; but theſe are repreſented as ſtrangely coarſe, rough and prickly, and ſeem to have been chiefly uſed among the monks by way of mortification, as the hair-ſhirt of later times. Du Cange, Gloſſ. Lat.

We have no camblets made in Europe of the goats hair alone ; even at Bruſſels they find it neceſſary to add a mixture of woollen thread.

England, France, Holland, and Flanders, are the chief places of this manufacture. Bruſſels exceeds them all in the beauty and quality of its camblets ; thoſe of England have been reputed the ſecond.

Camblets, *figured*, are thoſe of one colour, whereon are ſtamped various figures, flowers, foliages, &c. by means of hot irons, which are a kind of moulds, paſſed together with the ſtuff under a preſs. Theſe are chiefly brought from Amiens and Flanders : the commerce of theſe was anciently much more conſiderable than at preſent.

Camblets, *water*, thoſe which, after weaving, receive certain preparation with water ; and are afterwards paſſed under a hot-preſs, which gives them a ſmoothneſs and luſtre.

Camblets, *waved*, are thoſe whereon waves are impreſſed, as on tabbies ; by means of a calendar, under which they are paſſed and repaſſed ſeveral times.

The manufacturers, &c. of camblets, are to take care they do not acquire any falſe and needleſs plaits ; it being almoſt impoſſible to get them out again. This is notorious, even to a proverb : we ſay, a perſon is like camblet, he has taken his plait.

CAMBNITES lapis, in *Mineralogy*, a name given by the *Writers of the Middle Ages* to a ſtone, of which they record virtues which appear to ſavour too much of imaginary ones, ſuch as the curing of the dropſy by being tied to the arm : it ſeems to have been only a cloudy and leſs valuable kind of brown cryſtal.

CAMBODUNUM, or Campodunum, in *Ancient Geography*, a town of Vindelicia, 57 miles from Auguſta Vindelicum, now Kempten, in Suabia. Anton. Itin.

Cambodunum, a Britiſh ſtation in the Itinerary between Calcaria or Tadcaſter, and Manucium or Mancheſter. Dr. Gale and Mr. Baxter place it at Almonbury, where ſome Roman antiquities have been found ; but Mr. Horſley thinks it more probable that it was near Gretland.

CAMBOGE, Cambodia, or Levek, in *Geography*, the capital of Camboja, ſituated on a river of the ſame name. It conſiſts of one ſtreet, and a temple. The beauty of this temple is much extolled. It is ſupported by wooden pillars, varniſhed with black ; the foliages and reliefs are gilded : the pavement is curious and valuable, and mats are laid over it to preſerve it. The prieſts who ſerve in it hold the firſt rank in the ſtate. At a ſmall diſtance from this capital are ſeen the ruins of an ancient city, built with ſtone, the architecture of which ſomewhat reſembles the European ; and the adjacent lands are marked with furrows of former cultivation. No tradition concerning this city ſubſiſts among the preſent poſſeſſors of the country. N. lat. 12° 40′. E. long. 104° 48′.

Camboge, Camboja, Mecon, or Maykaung, names given to a large river which traverſes the whole country of Camboja. It riſes far north, and in the former part of its courſe, bears the name of Mecon ; in its further progreſs it paſſes by the towns of Lan-tchang, Tiem, and Columpé ; at a ſmall diſtance north of the capital it divides into three branches, two of which unite between the city and the ſea, and form the river, which aſſumes the name of Camboge ; the other branch is denominated Oubequame. Both diſcharge themſelves into the ſea by ſeparate mouths ; the mouth of the Camboge being in N. lat. 10° 20′ ; and that of the other in about N. lat. 10°.

CAMBOGIA, in *Botany*. See Garcinia.

CAMBOJA, Cambodia, Camboya, or Camboge, in *Geography*, a country of Aſia, bounded on the north by Laos, on the eaſt by Cochin-china and Ciampa, on the weſt by Siam and its gulf, and on the ſouth by part of the ſaid gulf, and the Indian Ocean ; and eſtimated at about 135 leagues in length, and 50 in breadth. This country, like Siam, is encloſed by mountains on the eaſt and weſt ; and it is fertilized by a large river, called Mecon, near its ſource, and Cambodia or Camboge near its æſtuary, and by ſome, very abſurdly, the Japaneſe river. This river, it is ſaid, begins to inundate the country in June. Near its mouth it is full of low iſles and ſand-banks, which impede the navigation, and it has no port or town. Sir George Staunton (Embaſſy to China, vol. i. p. 320.) informs us, on the authority of a manuſcript account of a voyage to this country, made in 1778, that the point of Cambodia, as well as the whole coaſt from thence to the weſtern branch of the great Cambodia river, is covered with under-wood, and exceedingly low. The ſea is ſo ſhallow, that at the diſtance of five or ſix miles from the ſhore, the water was ſeldom deeper than four fathoms ; and no veſſel much larger than a boat could approach within a couple of miles. The air is ſo hot that the inhabitants are under the neceſſity of reſiding on the banks of the rivers and lakes, where they are tormented by muſkettoes. The ſoil is fertile, and produces abundance of corn, rice, excellent legumes, ſugar, indigo, opium, camphor, and various medicinal drugs. The moſt peculiar product is the Camboge gum, which yields a fine yellow tint. Ivory alſo, and ſilk, are very plentiful, and of little value. The gold of this country is ſaid to be very pure; and it furniſhes amethyſts, hyacinths, rubies, topazes, and other precious ſtones. Cattle, particularly of the cow-kind, are numerous and cheap. Elephants, lions, tygers, and almoſt all the animals of the deſarts of Africa, are found in Cambodia. It has ſeveral precious woods, among which are the ſandal and eagle-wood, and a particular tree, in the juice of which they dip their arrows; and it is ſaid, that though a wound from one of the arrows proves fatal, the juice itſelf may be drank without danger. The country, though fertile, is very thinly peopled, inſomuch, that the king is hardly able to aſſemble 30,000 men; and its trade is inconſiderable. The inhabitants are Japaneſe, Chineſe, and Malays, together with ſome Portugueſe, who live without prieſts, and have intermarried with the natives. The men are generally well made, of a dark yellow complexion, with long black hair; their dreſs is a long and looſe robe; but the dreſs of the women, who are handſome, but not very modeſt, is ſhorter and cloſer. Their religion is idolatry. They manufacture very fine cloth, and the needle-work of the females is much admired.

CAMBONA, a ſmall iſland in the Indian Sea, near the ſouth coaſt of the iſland of Celebes. S. lat. 5° 22′. E. long. 125° 45′.

CAMBONES, a town of France, in the department of the Tarn, 7 miles E. of Caſtres.

CAMBONUM, in *Ancient Geography*, a place of Gaul, to the left of the Rhine, in the route which paſſes from Dea Vocontionum (Die), and Lucus Auguſti towards Vapincum (Gap), in going by Mons Seleucus.

CAMBORI, in *Geography*, a town of Aſia, in the kingdom of Siam, on the frontiers of Pegu, ſeated on a ſmall river which runs into the gulf of Siam.

CAMBORICUM, or CAMBORITUM, in *Ancient Geography*, a Britiſh ſtation in the fifth route of Antonine's Itinerary from London to Lugovallium or Carliſle, between Icianos and Duroliponte. All our antiquaries, except Mr. Horſley, fix Camboricum near Cambridge, at a place called by Bede, Grantceſter, and derive its name from *Cam*, crooked, and *brit*, a ford. Thoſe antiquaries who place Camboricum at Cambridge, fix Duroliponte at Godmancheſter.

CAMBRA, in *Geography*, a ſmall town of Portugal, in Beira.

CAMBRASINES, in *Commerce*, fine linen made in Egypt, of which there is a conſiderable trade at Cairo, Alexandria, and Roſetta or Raſchit. They are called cambraſines, from their reſemblance to cambrics.

CAMBRAY, in *Geography*, anciently *Camaracum*, a city of France, and principal place of a diſtrict, in the department of the North, ſeated on the Scheldt, which divides it into the eaſtern and weſtern parts, and fills its ditches with water. Before the revolution, it was the capital of Cambreſis, in the Low Countries, and the ſee of an archbiſhop, eſtabliſhed in 1559. The archbiſhop ſtyled himſelf Prince of the Holy Roman Empire, and Count of Cambreſis, and he was alſo lord of the city. It is well fortified, being defended by a ſtrong citadel on the Scheldt, and a fort; and as the land is low on that ſide of the river, the adjacent parts may be laid under water by means of ſluices. This city is large and tolerably handſome; its ſtreets are ſpacious; the place or ſquare for arms is ſo extenſive as to be capable of receiving the whole garriſon in order of battle. It has two collegiate churches, excluſively of the cathedral, which is dedicated to the virgin Mary, and one of the fineſt in Europe. The ſteeple is high, and from the top of it, commands a view of the whole city. It contains ten pariſh churches, three abbies, two convents, two hoſpitals, and ſeveral religious houſes. Its principal manufactures are lace, ſoap, and leather; and particularly the fine linen, hence called *cambric*. The eaſtern diviſion contains 6,600, and the weſtern 7,200 inhabitants; the former canton contains 14,391, and the latter 14,443 inhabitants; the whole territory comprehends 147¼ kiliometres, and 31 communes. Cambray is an ancient city, and was formerly imperial. It has been, on a variety of occaſions, the ſubject of conteſt between the emperors, the kings of France, and the earls of Flanders. In 1544 it was taken by the emperor Charles V. It was afterwards given to John of Montluc, by Henry III. of France, but beſieged by the Spaniards in 1596, when the inhabitants compelled the governor to ſurrender. Ever ſince it continued under the dominion of the houſe of Auſtria till 1677, when it came into the poſſeſſion of France. In Auguſt 1793, this city was inveſted and ſummoned to ſurrender by the Auſtrian general De Boros; the French general Declay returned for anſwer, that he did not underſtand ſurrendering, but he knew how to fight. In April, 1794, the French were defeated at Cæſar's camp, in the neighbourhood, by the allied army under the command of the duke of York, with the loſs of 1200 men, and three pieces of cannon; and the next day they left 1200 men dead on the field of battle, with the loſs of their general, Chapüy, 350 officers and privates taken priſoners, and 22 pieces of cannon. N. lat. 50° 10′ 32″. E. long. 3° 13′ 41″.

The league of Cambray, in 1508, was the moſt ſingular event that occurs in the hiſtory of Europe. It was a confederacy, inſtigated by pope Julius II. and which gained the concurrence of the emperor Maximilian I., of Louis XII. of France, by the ſuggeſtion of cardinal d'Amboiſe, and of Ferdinand king of Spain, for the final overthrow of the republic of Venice. This league originated in reſentment, and was diametrically oppoſite to the true intereſt of every one of the contracting powers. The republic of Venice had before this time acquired great power; but whatever were the means by which it had become thus powerful, it was now the bulwark of Italy; it prevented the pope from drawing the emperor or the king of the Romans, as he was then called, into Lombardy, againſt the French; it moderated the views of king Louis, and hindered him from extending his conqueſts; it kept the pope from being reduced to a ſtate of dependency; and it preſerved to Ferdinand the catholic the kingdom of Naples. Although it might have been the intereſt of each of theſe potentates, ſeparately, to recover, if poſſible, what had been taken from them by the republic; yet, to oblige her to refund all her conqueſts was to reduce a power of which they were all afraid, and thus to open a ſource of perpetual wars among themſelves. However, the league was formed; conſiſting of a variety of articles, advantageous to the ſeveral contracting parties, and threatening deſtruction to Venice. The execution of it was attended with all the ſucceſs that could be expected; for the emperor and the king of France wreſted from the Venetians almoſt all the cities which they poſſeſſed in Lombardy; nor was the pope remiſs in ſeizing all that lay convenient for his purpoſe. The Venetians, indeed, thought themſelves ſo little able to withſtand this powerful and formidable alliance, that they abandoned all the territories on the continent, after having loſt the famous battle of Ghiera d'Adda, in which their whole infantry was cut to pieces. However, after many humiliations and diſaſters, they preſerved their capital; and having either brought over, or bought over, the pope, the reſt of the confederacy was disjointed. The meaſures of the French and Germans, who were bent upon her total ruin, were traverſed by the king of Aragon and the pope, who would by no means concur in the utter deſtruction of the only power which had hitherto hindered theſe nations from ſubduing all Italy. The republic ſoon recovered a great part of her former territories; though ſhe was obliged to ſurrender to the pope Ravenna; to Spain, the five towns which ſhe had till this time poſſeſſed in Calabria; and to the emperor, Trieſte and Friuli.

CAMBREMER, a town of France, in the department of the Calvados, and chief place of a canton, in the diſtrict of Pont-l'Eveque; 5 leagues E. of Caen. The place contains 1200, and the canton 10,118 inhabitants; the territory includes 195 kiliometres, and 36 communes.

CAMBRENSIS, GIRALDUS, in *Biography*, arch-deacon, and afterwards, biſhop of St. David's, was born about the middle of the 12th century, and died after the year 1210. See GIRALDUS.

The account which this ancient prelate has given, in his deſcription of Wales, concerning the marvellous power which the Cambro-Britons and the Northumbrians had, of ſinging in parts ſpontaneouſly, at a time when counterpoint was unknown in the reſt of the world, not only merits notice here, but ſome diſcuſſion. See CAMBRO-BRITISH and NATIONAL MUSIC. Many eccleſiaſtical hiſtorians tell us that the organ was firſt admitted into the church at Rome by pope Vitalian, 666, the ſame pontiff who two years after ſent ſingers into Kent, to finiſh the work which Auſtin, the firſt Roman miſſionary, had begun. In 680, according to Bede, John, the præcentor of St. Peter's in Rome, was ſent over by pope Agatho to inſtruct the monks of Weremouth in the manner of performing the ritual, who opened ſchools for teaching muſic in other places of the kingdom of Northumberland. This may reconcile to probability ſome part of the following account, which Giraldus Cambrenſis gives of the peculiar manner of ſinging that was practiſed by the Welch, and the inhabitants of the north of England, about the end of the twelfth century.

" The Britons," ſays he, " do not ſing in uniſon, like the inhabitants of other countries; but in many different parts. So that when a company of ſingers among the common people meet to ſing, as is uſual in this country, as many different parts are heard as there are performers, who all at length unite in conſonance, with organic ſweetneſs. ' In unam denique ſub B mollis dulcedine blandâ conſonantiam et organicam convenientia melodiam.' In the northern parts of Great Britain, beyond the Humber, on the borders of Yorkſhire, the inhabitants uſe the ſame kind of ſymphonious harmony; except that they only ſing in two parts, the one murmuring in the baſe, and the other warbling in the acute or treble. Nor do theſe two nations practiſe this kind of ſinging ſo much by art as habit, which has rendered it ſo natural to them, that neither in Wales, where they ſing in many parts, nor in the north of England, where they ſing in two parts, is a ſimple melody ever well ſung. And, what is ſtill more wonderful, their children, as ſoon as they attempt uſing their voices, ſing in the ſame manner. But as not all the Engliſh ſing in this manner, but thoſe only of the north, I believe they had this art at firſt, like their language, from the Danes and Norwegians, who uſed frequently to invade and to occupy, for a long time together, thoſe parts of the iſland."

This extraordinary paſſage requires a comment. And firſt, it may be neceſſary, before we reaſon upon the circumſtances it contains, to be certain of their authenticity. Giraldus Cambrenſis is indeed an author who has been often ſuppoſed inaccurate and fabulous. " Girald Cambrenſis deſerves no manner of regard or credit to be given him; and his Chronicle is the moſt partial repreſentation of the Iriſh hiſtory that ever was impoſed on any nation in the world. He has endeavoured to make the venerable antiquities of the iſland a mere fable; and given occaſion to the hiſtorians that come after him, to abuſe the world with the ſame fictitious relations." Keating, part i. p. 13. Dr. Nicholſon, Biſhop of Derry's, Iriſh Hiſtorical Library, 1ſt ed. Dublin, 1724. The glaring improbabilities in the above account, with the manifeſt ignorance of the ſubject in queſtion, by no means contribute to augment his credibility. For whoever is acquainted with the laws of counterpoint, or with the firſt difficulties attending the practice of ſinging in parts, can have no exalted idea of the harmony of an untaught crowd, *turba canentium*, or ſuppoſe it to be much better than the diſſonant pæans of a good-humoured mob; in which the parts would be as various as the pitch of voices of which their chorus was compoſed. But how all theſe united at laſt in the conſonance of organic melody, and the ſoft ſweetneſs of B mollis, will long remain an impenetrable ſecret. If by *melodia organica* he meant organized, or harmonized, melody, we may ſuppoſe that the Cambro-Britons, in the time of Giraldus Cambrenſis, had acquired ſome knowledge in diaphonics, or diſcant; which according to John of Saliſbury, an elder writer, was practiſed to great exceſs in the 12th century. With reſpect to what he aſſerts of the people in Northumberland ſinging in two parts, it is more reconcileable to probability, from the circumſtances juſt mentioned, of the cultivation of muſic in that part of the world under Roman maſters, who may probably have firſt brought over the art of diſcant, or double ſinging, which the newly invented organ had ſuggeſted, by the facility it afforded of ſounding two or more notes at a time; which art, when practiſed by voices, was thence called *organum, organizare*. But as to what Giraldus ſays of children naturally ſinging in this manner as ſoon as they were out of the cradle, the reader will afford it what degree of weight he pleaſes; for our own part, we muſt own that it is not yet admitted into our muſical creed.

CAMBRESIS, in *Geography*, a province of France in the Low Countries, before the revolution, bounded on the north and eaſt by Hainault, on the ſouth by Picardy, and on the weſt by Artois. The length is about 10 French leagues, and its breadth from 5 to 6, and in ſome parts from 2 to 3. It is fruitful and populous, and watered by the Scheldt, Seille, and Sambre. The principal towns are Cambray, the capital, Chateau-Cambreſis, Crevecœur, Valincourt, and Vaucilles. Its inhabitants are laborious and lively, and addicted to the arts. Its commerce conſiſts chiefly in grain, ſheep, wool, and linen. Its paſtures are excellent, particularly for horſes and ſheep.

CAMBRETONIUM, in *Ancient Geography*, a Britiſh ſtation in the 9th route of Antonine's Itinerary, 15 miles from Anſa or Witham in Eſſex. Mr. Camden and Dr. Gale fix this ſtation at Brentonham, on the river Breton; but Mr. Horſley thinks that the diſtance ſuits better with Stratford, near the confluence of the Breton and the Stowr.

CAMBRIA, a name given to the province of Wales before the time of Cæſar's invaſion, and retained by it till about the cloſe of the 6th century, when it took the appellation of Wales; and when the inhabitants, likewiſe, with their ancient ſituation, loſt the title of Britons, and became diſtinguiſhed by the name of Welſh. See WALES.

CAMBRIC, in *Commerce*, a ſpecies of linen made of flax, very fine and white; the name of which was originally derived from the city of Cambray, where they were firſt manufactured. They are now made at other places in France.

The manufacture of cambrics hath long ſince proved of extraordinary advantage to France. For many years it appeared that England did not in this article contribute leſs than 200,000l. per annum to the intereſt of France. This proved motive ſufficient to induce the parliament of Great Britain to enact many ſalutary laws to prevent this great loſs of our wealth. See 18 Geo. II. c. 36. and 21 Geo. II. c. 26. See alſo ſtat. 32 Geo. II. c. 32. and 4 Geo. III. c. 37. which regulates the cambric manufactory, not long ſince introduced into Winchelſea in Suſſex; but very ſoon aboliſhed. The cambrics now allowed in this country are chiefly manufactured in Scotland and Ireland. Any perſon convicted of wearing, ſelling (except for exportation), or making up for hire any cambric or French lawns, are liable to a penalty of 5l. by the two firſt ſtatutes cited as above. The above cited ſtatute, 4 Geo. III. c. 37. eſtabliſhes the corporation of the Engliſh linen company for making cambrics and lawns, and enacts, that, whenever there ſhall be a manufactory of this kind, the commiſſioners of exciſe ſhall appoint the ſupervifor, or other officer, to ſeal the ſame; for which purpoſe notice ſhall be given by the manufacturer, before the piece is taken out of the loom, under penalty of 5l. and forfeiture of every ſuch piece. This piece ſhall be marked and numbered, on pain of 10l.; and an officer marking any piece not made in England, or after it is taken out of the looms, ſhall forfeit 50l. and his office. Attempt to bribe an officer incurs a penalty of 50l., and the officer accepting it forfeits 100l. and incurs the puniſhment of the pillory. Cambrics and lawns, made in England, and found unſtamped, ſhall be forfeited, ſeized, and ſold; and any perſon expoſing ſuch to ſale, or having them in his cuſtody for that purpoſe, ſhall forfeit 200l.; which goods ſhall be exported, and not relanded. To counterfeit the ſeal, or import any foreign cambrics or lawns with a counterfeit mark, or expoſe the ſame to ſale, knowing the ſtamp to be counterfeited, is felony without benefit of clergy.

CAMBRIDGE, in *Geography*, is a large, and the principal town in a county of the ſame name in England. It is particularly noted in the annals of literature and ſcience, for its univerſity, which has been honoured with the reſidence of many perſons of eminent and highly illuſtrious character, and provided for them the means of inſtruction. Concerning the priority of origin, and eſtabliſhment, of this, and the ſiſter univerſity at Oxford, there has been much controverſy with partial antiquaries. The original foundation of this town and ſeminary is involved in fabulous obſcurity; and the ſtories that have been propagated by ſome of the monkiſh writers confute themſelves by their own abſurdity. Without repeating any of theſe fables, or tracing up the annals of Cambridge anterior to the Roman colonization of Britain, we will endeavour to elucidate its hiſtory briefly from that period. "The ſite of the Roman *Granta*," obſerves Dr. Stukeley, "is very traceable on the ſide of Cambridge towards the caſtle, on the north-weſt ſide of the river, of an irregular figure containing 30 acres, ſurrounded by a deep ditch, great part of which remains on the ſouth-weſt, and in the grounds behind Magdalen college." Roman bricks, coins, urns, and pateræ have been found near this ſpot, and in the vicinity. The villages of Cheſterton and Grantcheſter, in the neighbourhood of Cambridge, have been conſidered by ſome antiquaries as occupying the ſites of Roman ſtations or camps; and as preſerving evidences of that in their preſent appellations. Other memorials of the Romans have been found in the military ways, or roads which diverged from the ſtation of Granta.

During the Anglo-Saxon dynaſties, the annals of Cambridge record but few events, and thoſe are merely of battles, ſieges, and other military operations. The univerſity, or rather a kind of academical inſtitution, appears to have been firſt founded early in the ſeventh century, by Sigebert, king of Eaſt-Anglia. How long this endured we are not informed; but as Alfred complained that he could not find teachers when he had youth and leiſure to be inſtructed, we may fairly preſume that there were no public ſeminaries at that time. The merit of reſtoring, or probably of founding the real univerſity belonged to Edward the Elder, ſon of Alfred the Great, who appears from the chronicle of Hyde-abbey, to have erected "halls for the ſtudents, and chairs and ſeats for the doctors, at his own charge." He alſo appointed profeſſors, and adopted other neceſſary meaſures which ſeemed to ſecure the ſtability of the inſtitution. In the year 1010 the town was fired, and plundered by the maurading Danes, who committed repeated depredations in this part of the iſland. At the time of the domeſday ſurvey, in the reign of William the Conqueror, it contained 373 houſes, 27 of which were ſhortly afterwards removed to make room for the *caſtle* erected by the Conqueror; or rather, as Fuller obſerves, "re-edified." In this fortreſs he ſoon afterwards received the ſubmiſſion of the monks of Ely, whoſe reſiſtance to his power appears to have been the principal inducement for erecting it. In the reign of William Rufus, the town and county of Cambridge were ravaged with fire and ſword by Roger de Montgomery, in revenge for an affront given him by the king. The univerſity was therefore for ſome time abandoned, but Henry I. induced the wandering ſtudents to return, by inveſting the town with many valuable privileges. He exempted it from the power of the Sheriff in the year 1101, and made it a corporation on payment to the exchequer of 100 marks annually. Joſfrid, abbot of Croyland, ſent four monks to Cottenham near Cambridge, from which place they daily repaired, according to Peter Bleſenſis, to the univerſity town, "and having hired a public barn, made open profeſſion of their ſciences, and ſoon collected a great number of ſcholars." Theſe continued to increaſe, and the place progreſſively acquired celebrity till 1174, when nearly the whole of the town was conſumed by a fire "ſo mercileſs," ſays Fuller, "that it only ſtopt for want of fuel to feed its fury." Moſt of the churches, as well as the houſes, appear to have been conſtructed with wood at this period. Tournaments were frequently held at Cambridge in the 13th century, and the concourſe of people was ſo great, that the ſtudents were much inconvenienced both in board and lodging. To remove this impediment to learning, Henry the Third forbade any tournament to be kept within five miles of the town. In examining the local annals of Cambridge, we find that frequent diſputes and altercations, often ending in battles, aroſe between the townſmen, and thoſe perſons connected with the univerſity. In 1281, a particular inſtance of this kind occurred. The towns-people aſſembled at their hall, and having choſen John Grantceter, for their leader, compelled him to ſwear that he would execute whatever the bailiff and burgeſſes ſhould command. Proceeding to Corpus Chriſti college, they broke open the doors, and carried away all the charters, and other documents; they next went to the houſe of the chancellor, whom they compelled, as well as all other perſons of the univerſity, to renounce the privileges that had ever been granted to them, and alſo deliver up all the letters-patent then in their poſſeſſion. After this they broke open the univerſity cheſt, which was kept in St. Mary's church, and taking out all the records, burnt them in the market-place, together with the papers they had previouſly collected. Numerous other acts of violence were committed. At length Henry Spencer, biſhop of Norwich, coming here with ſome ſoldiers, ſuppreſſed theſe daring tumults, and puniſhed the principal leaders; the mayor was deprived of his office, and the liberties of the town were declared forfeited, and beſtowed on the vice-chancellor, in whom they remained till the reign of Henry the Eighth, when the corporation was reſtored, but ſeveral of its former privileges were retained by the univerſity.

An inſurrection breaking out in the eaſtern counties in the time of Richard the Second, he ſummoned a parliament here in 1383. In this aſſembly a ſtatute was made againſt *wanderers*, or ſtudents of either univerſity, who traverſed the country *begging alms* without licence, which at that time was a common practice. On the 2d of May 1534, the univerſity renounced the ſupremacy of the Pope, and the next year ſurrendered all its charters, ſtatutes, and papiſtical muniments into the hands of Lord Cromwell. Theſe records were, however, ſoon afterwards reſtored, and the univerſity reinſtated in the full exerciſe of its privileges. From the death of Henry the Eighth, till the acceſſion of Elizabeth, the univerſity and town were in continued commotion, and various acts of hoſtility were committed by the oppoſite parties. The latter monarch, however, reſtored peace to the univerſity, where ſhe reſided five days in the early part of her reign. Here ſhe was entertained with various dramatic exhibitions, beſides orations, diſputations, and other academical exerciſes. On leaving the town, the queen in an elegant Latin ſpeech recommended the members of the univerſity to make the reſult of their ſtudies public.

In 1630, Cambridge was viſited by a dreadful plague, which occaſioned the buſineſs of the univerſity to be ſuſpended, and all the ſtudents had leave to retire to their reſpective homes. Between three and four hundred perſons fell victims to this direful malady. The aſſizes were at this time removed to Royſton. During the unhappy warfare between Charles I. and his parliament, the perſons of the univerſity very early declared themſelves in favour of the king, and as a pledge of loyalty, ſent their plate to be converted into money for his uſe, a few days before the erection of his ſtandard at Nottingham. This meaſure provoked the Cromwellian parliament, whoſe forces laid the town under repeated contribution, and the officers and ſtudents of the univerſity were compelled to ſeek ſafety in flight. Soon after the reſtoration, tranquillity was again reſtored; and ſince that period, various uſeful and important plans to promote the proſperity of the town, and the advantages of learning, have been progreſſively eſtabliſhed. The caſtle and fortifications have gradually crumbled in the courſe of time, and the univerſity has continued to increaſe its literary reputation from that epoch.

The extent of Cambridge occupies a ſpace of ground which meaſures about one mile from north to ſouth, and half a mile from eaſt to weſt. The ſtreets are in general narrow and winding, and the houſes ill-built, and too much crowded together. The town was firſt paved in the reign of Henry VIII. who, in his 36th year, cauſed it to be enacted by Parliament, that all perſons who had any houſes, lands, &c. in Cambridge, bordering on the highways, ſhould pave them to the middle of the ſaid ways, "in length as their grounds do extend," and alſo keep them in repair, under the penalty of ſixpence for every ſquare yard. In 1787, an act was paſſed "for the better paving, cleanſing, and lighting the town, and widening the ſtreets, lanes, and other paſſages." Many improvements in each of theſe reſpects have ſince been effected. The population compared with the limited extent of the town is very great; for beſides the perſons reſiding in the colleges, the number of inhabitants returned under the late act was 9273; of houſes 1733. The trade carried on at Cambridge is not inconſiderable; beſides that which is either immediately or remotely connected with the univerſity. The corporation conſiſts of a mayor, high ſteward, recorder, twelve aldermen, twenty four common council-men, four bailiffs, a town clerk, and other officers. The mayor, on the day of his election, has the privilege of beſtowing the freedom on any one perſon he may think proper. The choice of repreſentatives in Parliament is veſted in the mayor, bailiffs and freemen not receiving alms: the voters are about 200.

The *Caſtle* of Cambridge, of which there are ſcarcely any remains, was raiſed ſoon after the conqueſt; for 27 houſes are ſaid in the Conqueror's ſurvey to have been levelled for the purpoſe of erecting it. On the ſite of this ancient fortreſs, a new, large county gaol was lately built, upon a novel plan. Near this is a large conical mount, the keep of the ancient Norman caſtle. This occupies the higheſt ground in the town, and its ſummit commands a very extenſive tract of flat country. In the market place is a conduit, which was erected, and the water brought to the town by Thomas Hobſon the celebrated carrier, in 1614. Near it are the ſhire hall, and the town hall, two large buildings.

PUBLIC BUILDINGS. Cambridge contains 14 pariſhes, 13 of which are provided with their reſpective churches. Two only of theſe are, however, entitled to public notice, the others being moſtly ſmall, incongruous, and very inelegant buildings. Among the moſt ancient ſtructures in the town, and certainly the moſt curious ſpecimen of architectural antiquity it poſſeſſes, is the *Round Church*, or church of the *Holy Sepulchre*. This is one of the very few imitations which now remain in England, of the church of the Holy Sepulchre at Jeruſalem. The original building was perfectly circular, having its roof ſupported by eight large columns, between which and the outward wall, is a circular aiſle. The entrance door-way has a ſemi-circular arch of three different mouldings, which ſpring from capitals and columns of that ſtyle of architecture uſually called Saxon. Indeed the whole ſtructure was originally of this ſtyle, but has been altered at later periods; and at the time of ſuch alterations, the architects appear to have adopted the then prevailing mode of building. Mr. Eſſex (in vol. vi. of the Archæologia) affirms that it was built by the knights templars, or by ſome perſons concerned in the croiſades, in the reign of Henry the Firſt, or between the time of the firſt and ſecond cruſade. It is certainly the oldeſt church of the kind in England, though the temple church in London, and the round church in Northampton, are conſtructed nearly ſimilar in their reſpective ground plans; though their arches, columns, and ornaments, are very diſſimilar.

The univerſity church, called *Great St. Mary's*, though a large ſpacious building, is not remarkable either for its beauty, or uniformity of architecture. It was built by contribution, and though begun in the year 1478, it was not completely finiſhed till 1608. In the years 1783 and 1784, about 1500*l.* were expended in "repairing and beautifying this church;" but the alterations not being directed by taſte, have neither beauty nor ſcience to recommend them to our approbation. The other churches of Cambridge are moſtly built with brick walls, which are plaſtered and whitewaſhed.

The moſt conſpicuous and moſt celebrated building of the univerſity is *King's College chapel*, which, for elegance and beauty of parts, for grandeur of effect, and ſcientific conſtruction, is juſtly admired by all artiſts, connoiſſeurs, and architects. The deſign of this ſtructure is at once bold, chaſte, and profound; and its exterior and interior effects are grand and impreſſive. It conſiſts of only one ſpace or aiſle, which meaſures 287 feet in length, by 44 feet in width, and 93 feet in height. This ſpacious apartment is ſurrounded with various attractive beauties; and the ſculptor, painter, glazier, and architect, ſeem to emulate each other in exciting admiration. The whole interior ſuperficies is covered with numerous ſculptured ornaments, among which the arms and cognizances of the houſes of York and Lancaſter are moſt prevalent. The roſe, portcullis, fleur de lis, with ſhields of arms, are ſtuck all over the walls. Theſe are carved in high alto-relievo, and are executed with great ſkill and taſte. Some of the ſupporters diſplay the hand of a firſt-rate ſtatuary, and though cut in ſtone, are equal in contour, expreſſion, and character, to almoſt any marble ſculpture. A wooden ſkreen ſeparates the ante-chapel from the choir. The latter has two rows of ſtalls of carved wood on each ſide, and on the pannels at the back part of the upper rows, are carved the arms of all the Engliſh kings from Henry the Fifth to James the Firſt. The whole chapel is lighted by 26 large windows, beſide ſome ſmaller ones, which communicate to different lateral chapels, or chantries. Theſe occupy the ſpaces between the buttreſſes, and are now appropriated to libraries, and to other purpoſes. All the upper windows, except that at the weſt end, are filled with painted glaſs, which, for the ſtyle of drawing, colouring, compoſition, expreſſion, &c. manifeſt great talents in the artiſts who executed it. The groining and conſtruction of the roof of this fabric are regarded with admiration and aſtoniſhment. In forming the arch, and diſpoſing the materials, the architect has diſplayed ſuch a profound knowledge of geometrical principles, as to confound almoſt every other artiſt who has ſince examined his workmanſhip. It is traditionally reported that Sir Chriſtopher Wren annually viſited this pile, to view the roof; and the ſame tradition has given currency to an abſurd remark, which that great architect is ſaid to have made. This roof was executed by John Waſtell, and Herry Semerick, who by an indenture ſtill extant agree "to make, and ſett up, at their own coſts and charges, a good, ſure, and ſufficient vawte, for the grete church there, to be workmanly wrought, made and ſett up after the beſt handlying and forme of good workmanſhip according to a plat thereof made and ſigned with the hands of the lords executors to the kyng of moſt famous memorye Herry the VII, &c." They alſo agree to provide ſtone, and every other requiſite for the ſaid work, to finiſh it in three years, and to receive 1200*l.* for their whole labour and materials.

This magnificent fabric was begun by king Henry VI. who left particular directions in his will, and bequeathed ample endowments for the completion of the chapel and the whole college buildings, &c. But the former was not completed till the reign of Henry VIII. and the latter have never been finiſhed. It appears that only a part of the walls at the eaſt end of the chapel and to a certain height on the north and ſouth ſides, were raiſed during the lifetime of the founder. The building was a little advanced by Richard III.; and Henry VII. made much greater progreſs in the work. It advanced with rapidity during the reign of Henry VIII. and the caſe or ſhell of the building was finiſhed in 1515. For further particulars relating to the hiſtory and character of this ſtructure, ſee Malden's Account of King's College Chapel, 8vo.

Near the north ſide of this chapel is the *Senate Houſe*, which was built by Gibbs the architect from a deſign by ſir James Burroughs, who was maſter of Caius College. It was begun in the year 1722, and coſt nearly 20,000*l.* in completing; about 11,000*l.* of which were contributed by individual benefactors. It is built entirely of Portland ſtone, and adorned with pilaſters, frieze, baluſtrades, &c. in the Corinthian ſtyle of architecture. In the middle, both of the ſouth and eaſt fronts, is a grand triangular pediment, ſupported by four fluted columns of the ſame order. The interior is occupied by one large room, where all the public buſineſs of the univerſity is tranſacted. It meaſures 101 feet long by 42 feet broad, and 32 feet high. Near this building is the *Public Library*, which conſiſts of four rooms on the upper floor; the ground floor, conſiſting of three ſides of a ſquare, being occupied by the *Schools*. The library contains many curious, valuable and intereſting objects; among which is an antique ſtatue of Ceres brought from the temple at Eleuſis, the Cippus from the tomb of Euclid, the Beza MS.; and numerous other rarities.

Moſt of the other public buildings being connected with the colleges and halls, we ſhall notice the moſt intereſting under their reſpective eſtabliſhments, and ſhall arrange theſe in the chronological order of their foundations. Previous to the erection of colleges, the ſtudents reſided in hoſtels, or inns, which were provided by the townſmen for their reception. All the charges of education and maintenance were paid by themſelves; though the ſcholaſtic degrees and government were, according to the report given of the ancient ſtatutes, nearly the ſame as at preſent. In the time of Richard II. the number of hoſtels at Cambridge amounted to 16. The extravagant terms of landlords' charges probably gave riſe to the colleges; as it is recorded that they were very extortionate in their demands.

Colleges, &c.—The univerſity buildings conſiſt of twelve colleges and four halls, which laſt poſſeſs the ſame privileges as the former. Each of theſe contains apartments for the ſtudents and fellows, a maſter's lodge, a chapel, a library, a hall, and a combination room. In the following table is recorded, in chronological order, the name and the time of founding each of theſe inſtitutions.

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|---|---|
| 1. Peter Houſe College, founded - - | 1257 |
| 2. Clare Hall, - - - | 1326 |
| This being burnt, was rebuilt in - - | 1344 |
| Again completely rebuilt in - - | 1638 |
| 3. Pembroke Hall, - - - | 1343 |
| 4. Gonville and Caius College, built by E. Gonville, | 1348 |
| Enlarged by Dr. Caius, - - - | 1557 |
| 5. Corpus Chriſti, or Bene't College, - | 1344 |
| Augmented in revenues, &c. - - | 1356 |
| 6. Trinity Hall, - - - | 1350 |
| 7. King's College, - - - | 1441 |
| 8. Queen's College, - - - - | 1448 |
| 9. Catharine Hall, - - - | 1475 |
| 10. Jeſus College, - - - | 1495 |
| 11. Chriſt's College, - - - - | 1505 |
| 12. St. John's College, - - - | 1509 |
| 13. Magdalen College, - - - - | 1519 |
| 14. Trinity College, - - - | 1546 |
| 15. Emanuel College, - - - - | 1584 |
| 16. Sidney Suſſex College - - | 1598 |

In addition to theſe, a new college, upon a large and grand ſcale, is propoſed and intended to be erected in purſuance of the will of ſir George Downing. This gentleman,

man, in the year 1717, deviſed various eſtates, &c. in failure of certain iſſue, for this purpoſe. The validity of the will was diſputed by ſome of his relatives, but after many years' litigation was finally ſettled in 1800, and the maſter, profeſſors, and three of the fellows are already appointed: thirteen other fellows are to be choſen when the college is built. We ſhall proceed to notice a few particulars relating to each of the above-named foundations.

*St. Peter's College*, uſually called Peter-Houſe, originally conſiſted of two hoſtels, which were purchaſed by Hugh de Balſham, ſub-prior of Ely, who appropriated them, in 1257, to the uſe of ſtudents. In 1284 he completely endowed his foundation for the ſupport of a maſter, 14 fellows, 29 bible-clerks, and 8 poor ſcholars; the number to be increaſed or diminiſhed according to the fluctuation of the revenues. Numerous benefactions have ſince been given to this foundation, and the fellowſhips are accordingly increaſed. The chapel was erected by ſubſcription in the year 1632, and is neatly embelliſhed, but was deprived of many of its ornaments by the fanatics in the civil wars. The building ſurrounds two courts, which are ſeparated by a cloiſter and gallery, and the largeſt court has had its buildings caſed with ſtone within a few years.

*Clare Hall* was built on the ſite of the Univerſity Hall, which was a ſmall college, founded in the year 1326 by Dr. Richard Baden, then chancellor of the univerſity. About 16 years after its erection, it was conſumed by fire, but rebuilt on a much more extenſive ſcale in 1344, by Elizabeth de Burg, heireſs to the laſt earl of Clare. By this lady it obtained its preſent name, with endowment for a maſter, 10 fellows, and the ſame number of ſcholars. Richard III., Thomas Cecil, earl of Exeter, John Freeman, eſq., William Butler, eſq., and Samuel Blyth, eſq. all contributed in augmenting the revenues, which now maintain 17 fellows, and between 30 and 40 ſcholars. This is the moſt uniform in its buildings, and is the moſt pleaſantly ſituated of any college in the univerſity. It was rebuilt of ſtone in 1638, except its chapel, which was erected in 1703, from a deſign by ſir James Burroughs. This college ſtands near the north-weſt angle of King's College chapel.

*Pembroke Hall* was founded by Mary, counteſs of Pembroke, in 1343, and endowed in purſuance of a charter from Edward III. for a maſter and ſix fellows. Among the benefactors who have enlarged this eſtabliſhment, Henry VI. is the moſt conſiderable; who augmented it with the rich living of Soham in this county, and with ſome other rectories. In his charter it is termed "the moſt noble, renowned, precious college, which, among all others in the univerſity, was ever wonderfully reſplendent." The preſent number of fellowſhips is 16, and the ſcholarſhips about 70. The chapel was built from a deſign of ſir Chriſtopher Wren, by his uncle, biſhop Wren. Contained in a ſmall detached building of this college is a large and curious aſtronomical machine, or ſphere, which was given and partly made by Dr. Roger Long, author of a celebrated treatiſe on aſtronomy; in which work it is particularly deſcribed; and the Dr. at his death bequeathed the intereſt of 200*l.* bank annuities to keep "the inſtrument and place" in good repair. This, like many other uſeful bequeſts, is perverted to private emolument, and the object conſequently neglected. This college conſiſts of two courts, which are ſeparated by the hall, having the combination room at one end.

*Corpus Chriſti*, or *Bene't College*, differs in its origin from all others, in either of the univerſities; thoſe having been founded by the benevolence of one or two perſons, while this was eſtabliſhed by the union of two guilds, or religious ſocieties. The college was begun in 1344, and its buildings were rapidly advanced by the influence of Henry Plantagenet duke of Lancaſter, whom the brethren had choſen as their firſt *alderman*. By the munificence of ſir John Cambridge and his ſon, the revenues were conſiderably augmented and finally appropriated, in the year 1356, to the maintenance of a maſter, eight fellows, three bible-clerks, and ſix ſcholars. Since that period, the endowments have increaſed ſufficiently to ſupport twelve fellowſhips, and nearly ſixty ſcholarſhips. The name of Bene't, or Benedict college, aroſe from its proximity to the church dedicated to that ſaint. Matthew Parker, archbiſhop of Canterbury, was the greateſt benefactor to this college, having founded two fellowſhips and five ſcholarſhips, and beſtowed on it the valuable library of Stoke-clare college, Suffolk, beſides many other printed books and manuſcripts. This college conſiſts principally of buildings round a ſquare court.

*Gonville and Caius College*, commonly called Keys College, was originally founded in the year 1348, by Edmund Gonville, who left a large ſum of money with Dr. Bateman to finiſh and endow it. The doctor being then employed on his own college (Trinity) did not immediately proceed with this building, but afterwards had it erected near his own foundation. Thus the preſent building is poſterior to that of Trinity, but its foundation and endowment being anterior, it certainly claims precedence in chronological arrangement. After its completion, it was called Gonville Hall; but in 1557 it obtained the preſent title, and was conſiderably increaſed in revenues and buildings. This was effected by Dr. John Caius, phyſician to queen Mary, who built a new court, and three remarkable gates of various and eccentric architecture. That on the ſouth, communicating with the ſchools, is ſaid to be the firſt ſpecimen of regular or Roman architecture erected in this country. The gates are reſpectively inſcribed, "Humilitatis," the gate of Humility; "Virtutis," the gate of Virtue; "Io. Caius Poſuit Sapientiæ," John Caius built this in honour of Wiſdom; "Honoris," the gate of Honor. Since the deceaſe of Dr. Caius, the fellowſhips have increaſed to 29, and the ſcholarſhips to nearly 100. The principal court of this college has been partly rebuilt, and is caſed with ſtone.

*Trinity Hall* was one of thoſe original hoſtels wherein the ſtudents reſided at their own expence. It was purchaſed by Richard Crowder, prior of Ely, in the reign of Edward III.; and was converted into a college, in 1351, by Henry Bateman, biſhop of Norwich. The founder provided for a maſter, three fellows, and two ſcholars; but various ſubſequent benefactions have increaſed the fellowſhips to twelve, and the ſcholarſhips to fourteen. The whole of this hall is faced with ſtone, and the buildings have a neat and uniform appearance.

*King's College*, the glory and pride of the univerſity, owes its origin and foundation to king Henry VI. who, in 1441, dedicated it, and in 1443 fully endowed it for a provoſt, 70 fellows, or ſcholars, 3 chaplains, 6 clerks, 16 choriſters, and a muſic maſter, 16 officers of the foundation, 12 ſervitors for the ſenior fellows, and 6 poor ſcholars. The monarch, dying before the eſtabliſhment was completed, left particular directions and bequeſts in his will for the fulfilment of his magnificent and pious deſigns. Theſe, however, were never completed, and only a ſmall part of the intended buildings have been erected. Some peculiar privileges appertain to this college. (See Raworth's Univerſity Calendar, 12mo. 1801.) Edward IV. inſtead of forwarding the plans of his predeceſſor, deprived this college of many large eſtates, which, with aggravated injuſtice, he gave to ſome of the ſycophant Oxonians then about his court. Henry VII. being ſafely ſeated on the throne, directed his attention, towards the latter end of his reign, to this building, on which he expended 2000*l.* and preſented the college with 5000*l.* more for the purpoſe of finiſhing the chapel. Beſides the elegant chapel already noticed, this college conſiſts of a row of buildings to the ſouth, alſo a large ſquare of buildings to the north of the chapel, and the provoſt's reſidence, &c. to the eaſt. In the library of the chapel is a plan of the college, as intended to be built by Henry VI. and ſome additional buildings are now propoſed to be erected.

*Queen's College* was founded in the year 1448, and endowed with revenues to the amount of 200*l.* per annum for the ſupport of a principal and four fellows, by Margaret of Anjou, the intrepid conſort of Henry VI. Elizabeth Widville, or Grey, queen of Edward IV. though a profeſſed enemy to the founder, was prevailed on by Andrew Ducket the maſter, to complete this college, and eſtabliſh it for a maſter, 19 fellows, and 45 ſcholars. The lady Elizabeth has ſince been annually celebrated as the co-founder. The buildings ſurround two quadrangular courts, one of which has a cloiſter of about 330 feet encompaſſing it. The chapel is fitted up peculiarly neat.

*Catharine Hall* owes its foundation to Robert Woodlark, chancellor of the univerſity, who in the year 1474 endowed it for a maſter and three or more fellows. This number is now increaſed to five; and eight bye-fellowſhips with ten ſcholarſhips have ſince been added. The buildings occupy three ſides of a quadrangular court.

*Jeſus College* was erected on the ſite of an ancient Benedictine nunnery, and founded by John Alcock, biſhop of Ely, in 1496, for a maſter, ſix fellows, and ſix ſcholars. The endowments have been increaſed, and now provide for ſixteen fellows, and nearly fifty ſcholars. This college is ſituated at a ſhort diſtance from the town, and its chapel, from the ſize and character, appears to have been the ancient conventual church, which was dedicated to St. Rhadagund in 1160.

*Chriſt's College* was built on the ſite of an hoſtel, called God's-Houſe, and appears to have been firſt founded by Henry VI. and completely endowed, in 1506, by Margaret counteſs of Richmond and Derby. The perſons now maintained on this eſtabliſhment are a maſter, 15 fellows, and about 70 ſcholars. The ancient buildings of this college incloſe a ſmall quadrangular court, behind which is a more modern uniform building, erected by Inigo Jones.

*St. John's College* received its name from the diſſolved hoſpital of St. John's, on the ſite of which it was built, and founded in 1511, though not opened till 1516. This was originally endowed by Margaret counteſs of Richmond, for a maſter and thirty-one fellows; but ſubſequent benefactions have united to raiſe a revenue to ſupport ſixty-one fellows and one hundred and fourteen ſcholars. The buildings of this college are moſtly of brick, and ſurround three courts.

*Magdalen College* owes its origin to Edward Stafford duke of Buckingham, who erected part of the preſent fabric, and intended to have endowed, and named it from his own title, but being beheaded, this with his other property was confiſcated. In 1542 it was obtained from the king, and endowed by Thomas lord Audley, for a maſter and four fellows. The latter number has ſince been increaſed to ſeventeen, and ſeveral ſcholarſhips have alſo been added. This college is built of brick, and conſiſts of two courts. Its library is noted on account of containing the valuable books and MSS. of Samuel Pepys eſq. who was ſecretary to the Admiralty in the reigns of Charles II. and James II.

*Trinity College* contains the largeſt buildings, and poſſeſſes the moſt conſiderable endowments of any collegiate eſtabliſhment in this univerſity. Its buildings ſurround two very large quadrangular courts, and its entrance-gateway, chapel, and library are fine and intereſting objects of architecture. This college was founded by Henry VIII. in 1546, on the ſite of two other colleges and a hoſtel, and endowed for a maſter, ſixty fellows, ſixty-ſeven ſcholars, four conducts, three public profeſſors, thirteen poor ſcholars, twenty beadeſmen, and other officers with ſervants: the number on the eſtabliſhment, at preſent, amounts to upwards of four hundred. The inner-court is called Neville's-court, from the name of Dr. Thomas Neville, at whoſe expence it was chiefly built, in the year 1609. Its weſtern ſide is formed by the library, which is a magnificent and ſpacious building, 200 feet in length, by 40 in breadth, and 38 in height. Beneath the library is a ſpacious piazza, which opens to the river and the gardens. In the chapel is a fine ſtatue of ſir Iſaac Newton, executed by Roubiliac. This figure is conſidered one of the fineſt ſpecimens of Engliſh ſtatuary.

*Emanuel College* was founded by ſir Walter Mildmay, on the ſite of a Dominican convent, in 1584, and endowed for a maſter, three fellows, and four ſcholars. By additional donations the revenues now ſupport fifteen fellows, and nearly one hundred ſcholars and exhibitioniſts. The hall is ſaid to be the moſt elegant of any in the Univerſity.

*Sidney Suſſex College* derives its foundation from Frances Sidney, counteſs of Suſſex, who, by will, dated December 6th 1588, bequeathed 5000l. and ſome other property to found a college for a maſter, ten fellows, and twenty ſcholars. The firſt ſtone of this college was laid on the 20th of May 1596, and the building completed in little more than three years. The chapel and the library were rebuilt about twenty years ſince, and various other alterations made at the ſame time. The foundation provides for ſeven fellows, ten bye-fellows, twenty ſcholars, and twenty-four bye-ſcholars, beſides a mathematical lecturer, and ſeveral exhibitioners.

In each, and all of theſe colleges, are various portraits of founders, and eminent perſons who have received education, or been immediately connected with the reſpective foundations. Each, alſo, contains a library, and in ſome are various uſeful, curious, and valuable natural and artificial objects. Numerous manuſcripts, miſſals, &c. contribute to enrich, and dignify many of theſe libraries; but to particularize the whole, or even barely to mention the moſt conſiderable, or important, would compel us to extend this article beyond the bounds of propriety and conſiſtency. At the end we ſhall refer to ſuch works as contain more detailed information on theſe ſubjects. All the colleges of this Univerſity are accommodated with ſpacious and pleaſant gardens, having convenient walks, which are ſheltered and enriched with rows of noble trees. Moſt of them are ſituated on the banks of the river Cam, at the weſtern extremity of the town. It is juſtly remarked by ſtrangers who viſit Cambridge, that its colleges and public buildings are, in general, neither grand, elegant, nor in a good ſtyle of architecture; and that a national Univerſity ſhould diſplay and encourage the polite arts of the country. In the college now preparing to be built, it is hoped that the directors or Committee will ſelect ſuch deſigns as ſhall at once be a memento of their taſte, an honour to the Univerſity, and creditable to Engliſh talent.

*The Univerſity* is compoſed of a chancellor, vice-chancellor, the maſters or heads, fellows of colleges, and ſtudents, amounting in all to more than 2000 members; and is incorporated as a ſociety for the ſtudy of all the liberal arts and ſciences. Each college, or hall, is a body of itſelf, and bound by its own ſtatutes; but is likewiſe controuled by the paramount law of the Univerſity, each furniſhing members for the government of the whole; which government is adminiſtered by the following officers:—

1. *A Chancellor*, who is ſome nobleman, and may be changed every two years, or continued longer by the tacit conſent of the Univerſity.—2. *A High Steward*, choſen by the ſenate, and holding his office by patent from the Univerſity; he is allowed a deputy.—3. *A Vice-chancellor*, who is uſually the head of ſome college or hall, and choſen yearly on the 4th of November, out of two perſons nominated by the heads.—4. *Two Proctors*, choſen annually on the 10th of October, who muſt be maſters of arts; they attend to the diſcipline and behaviour of all under-maſters of arts; read the graces, and take the votes in the White-hood houſe. —5. *Two Taxors*, choſen as the proctors, and who with them are clerks of the markets, and have cognizance of weights and meaſures; they were originally intended to tax, or fix the rent of the houſes let to the ſcholars for their reſidence.—6. *Two Moderators*, who ſuperintend the exerciſes and diſputations in philoſophy, and the examinations previous to the degree of bachelor of arts.—7. *Two Scrutators*, whoſe office is to read the graces, and take votes of the Black-hood houſe, to which they always belong.—8. *A Commiſſary*, who is uſually appointed an aſſiſtant or aſſeſſor, and deputy high-ſteward to the vice-chancellor in his court, (much the ſame as a recorder is to a mayor, or a chancellor to a biſhop).—9. *A Public Orator*, who is the mouth of the Univerſity on public occaſions, writes their letters, preſents noblemen to their degrees with a ſpeech, &c.—10. *The Caput* conſiſts of the vice-chancellor, a doctor of divinity, a doctor of laws, a doctor of phyſic, a regent and non-regent maſter of arts, who are choſen yearly on the 12th of October, and are to conſider and determine what graces are proper to be brought before the body of the Univerſity; and each of them has a negative voice. All graces muſt firſt paſs the caput before they can be produced to the ſenate.—11. *Two Librarians.*—12. *A Regiſtrar.*—13. *Three Eſquire Bedells*, &c. There are alſo profeſſors in divinity, civil law, phyſic, caſuiſtry, hebrew, greek, arabic, mathematics, philoſophy, aſtronomy, anatomy, chemiſtry, botany, modern hiſtory, common law, foſſils, and muſic.

*The Senate* is compoſed of all the doctors and maſters of arts in the Univerſity, and is divided into two bodies or houſes. The firſt conſiſts of regents, or thoſe who have not been maſters of arts five years: they are alſo called white-hoods, from the hoods of their official dreſſes being lined with white ſilk. The ſecond, of non-regents, or thoſe who have taken the degree of maſter upwards of five years, but have not advanced to the degree of doctor; theſe are called black-hoods for a ſimilar reaſon. The doctors under two years ſtanding vote ſolely in the regent-houſe; but all others, with the public orator, may vote in which houſe they pleaſe; and either houſe is competent to reject a queſtion. In the ſenate-houſe the election of all officers takes place, the appointments of the magiſtrates, the admiſſion to degrees, and all other important buſineſs of the Univerſity. No language but Latin is permitted to be ſpoken at any official meeting in the ſenate-houſe. Some queſtions are determined by the body collective, as the choice of members of parliament. At the election in 1790, the number of members who voted was 684; abſent, or did not vote, 181; in all 865. The privilege of ſending members to parliament was firſt granted to the Univerſity by James I. in 1604. The whole number of fellows in the Univerſity is 406, and of ſcholars 666; beſides which there are 236 inferior officers and ſervants of various kinds, who are maintained on the foundation; theſe, however, are not all the ſtudents of the Univerſity. There are beſides two other orders, called penſioners, the greater, and the leſs: the greater penſioners are the young nobility and gentlemen of fortune, who are called fellow-commoners, becauſe they dine with the fellows; the leſs are dieted with the ſcholars; but both live at their own expence. There is alſo a conſiderable number of ſcholars of an inferior fortune, called ſizars: theſe, though not of the foundation, are capable of receiving many benefactions called exhibitions, which aſſiſt them greatly in paſſing through an expenſive education; and frequently, by merit, they ſucceed to the higheſt honours and emoluments. The ſtudents, according to their ſtanding and proficiency in learning, are entitled to the degrees of bachelor and maſter of arts, bachelor and doctor in divinity, phyſic, and law. The time required by the ſtatutes for ſtudying in the Univerſity, before each can be qualified for taking the ſaid degrees is three years for a bachelor, and about four years more for a maſter of arts; ſeven years after that he may commence bachelor of divinity, and then five years more are required to take the degree of doctor in divinity. In law, a ſtudent may commence bachelor after ſix years, and in phyſic after five years ſtanding: both may be proctors at the end of five years more. The proper time for conferring theſe degrees is called the commencement, which is always the firſt Tueſday in July, when the maſters of arts, and doctors of all faculties, complete their degrees reſpectively. The examination for the degree of bachelor of arts uſually begins on the Monday ſe'nnight after the Epiphany, and the degree is completed on the ſecond tripos-day next following. Perſons are commonly admitted to the degree of bachelors in divinity on the 11th of June. The nobility, which includes baronets, as ſuch, are entitled to degrees without waiting the ſtatutable time. In the year 1786, ſome diſputes having aroſe concerning the practice of conferring degrees in right of nobility, the ſtatutes were examined, and it was determined that the following perſons were entitled to honorary degrees: *viz.* 1. Privy-counſellors.—2. Biſhops.—3. Noblemen—Dukes, Marquiſſes, Earls, Viſcounts, Barons—4. Sons of Noblemen.—5. Perſons related to the king by conſanguinity or affinity, provided they be alſo honourable.—6. The eldeſt ſons of ſuch perſons.—7. Baronets.—8. Knights. The two laſt to the degree of M. A. only.

As a ſtimulus to that laudable emulation which ſhould ever be encouraged in the youthful mind, the Univerſity, and different individuals have left ſeveral ſums of money, &c. to be annually diſtributed among the ſcholars, as "the reward of merit."—The yearly donations thus beſtowed by the Univerſity amount to 353l. 5s. of which 50l. is given to ſuch as excel in mathematics, and 303l. 5s. for the encouragement of claſſical and Engliſh compoſitions. The annual prizes conferred by individual colleges amount to 286l. two-thirds of which are appropriated to promote claſſical literature.

Thus, by the liberality of different perſons, zealous for the honour and advantages of learning, has this Univerſity attained a high degree of eminence, and many of its members have been materially benefitted. The various incentives to excellence here held forth, and the numerous rewards of merit annually diſtributed are exquiſitely adapted to rouſe genius into energy, and impel ſluggiſhneſs to action, to give reſolution to timidity, and furniſh modeſty with hope. How animating muſt it be to the emulous mind, to reflect that, " it is placed under thoſe venerable walls, where a Hooker and a Hammond, a Bacon and a Newton, once purſued the ſame courſe of ſcience, and from whence they ſoared to the moſt elevated height of literary fame. This is that incitement which Tully, according to his own teſtimony, experienced at Athens, when he contemplated the porticoes where Socrates ſat, and the laurel grove where Plato diſputed." (Idler, N° 33.) N. lat. 52° 12′ 36″. E. long. 0° 4′ 15″.

" Majeſtic Granta, hail thy awful name,
Dear to the muſe, to liberty, to fame." MASON.

Deighton's Cambridge Guide, 12mo. 1804. The Cambridge Univerſity Calendar, 12mo. 1805. Memorabilia Cantabrigiæ, 8vo. 1803. Parker's Hiſtory and Antiquities of Cambridge, 8vo. Fuller's Church Hiſtory, fol.

CAMBRIDGE, a townſhip in Grafton county, New Hampſhire, North America, E. of Androſcoggin, and S. of Umbagog lake.

Alſo, a townſhip of Waſhington county, New York, containing, by the cenſus of 1790, 4996 inhabitants, including 41 ſlaves; and by the cenſus of 1796, it appears, that it has 623 electors.—Alſo, the half-ſhire town of Middleſex county, Maſſachuſetts, which is one of the largeſt and moſt reſpectable townſhips of the county. Its three pariſhes, Cambridge, Little Cambridge, and Menotomy, contain three congregational meeting-houſes, one for Baptiſts, and another for Epiſcopalians, a number of pleaſant ſeats, and 2115 inhabitants. It is connected with Boſton by an elegant bridge. The public buildings are the meeting-houſes, court-houſe, and the edifices belonging to Harvard Univerſity, which are four in number, *viz.* Harvard, Hollis, Maſſachuſetts Halls, and Holden chapel. This Univerſity is, with regard to its library, philoſophical apparatus, cabinet of minerals, and profeſſorſhips, the firſt literary inſtitution on the American continent. It takes its date from the year 1638, ſeven years after the firſt ſettlement in the townſhip, then called Newtown. It has generally from 140 to 200 ſtudents. By a mean of the obſervations made in this place during the years 1781 and 1783, its temperature appears to be 50° 3, that is, about 10 degrees below the European ſtandard. N. lat. 42° 25′. W. long. 71° 10′.—Alſo, a poſt-town of Ninety-ſix diſtrict, in the upper country of South Carolina, where the circuit courts are held. It contains about 60 houſes, a court houſe, and a brick-gaol. The college by law inſtituted here, is no better than a grammar-ſchool: 80 miles N.N.W. of Columbia; 50 N. by W. of Auguſta in Georgia; 140 N.W. of Charleſtown, and 762 S.W. of Philadelphia. N. lat. 34° 9′.—Alſo, the chief town of Dorcheſter county, Maryland, ſituate on the ſouth ſide of Choptank river, about 13 miles E.S.E. from Cook's point at its mouth: nine W.S.W. from Newmarket; and 57 S.E. from Baltimore. Its ſituation is healthy, and it contains about 50 houſes, and a church. N. lat. 38° 34′. —Alſo, a town of Franklin county, Vermont, ſituate on both ſides of La Moille river, about 20 miles W. of Lake Champlain. It has 359 inhabitants.

CAMBRIDGE *Manuſcript*, or *Beza's MS.* a copy of the Goſpels, and Acts of the Apoſtles in Greek and Latin, noted by Wetſtein in the 1ſt and 3d parts of his Greek Teſtament by the letter D. In the Greek it is defective, from the beginning to Matth. i. 20; in the Latin, to Matth. i. 12; and it has likewiſe the following chaſms: Matth. vi. 20.— ix. 2. xxvii. 1—12. John, i. 16.—iii. 26. Acts, viii. 29.—x. 14. xxi. 2—10. xxii. 10—20. And from xxii. 29 to the end. Some pages of this MS. containing Matth. iii. 8—16. John, xviii. 13.—xx. 13. Mark, xvi. 15, to the end, are written by a later hand, which Wetſtein refers to the 10th century, but Grieſbach to the 12th. The Goſpels are arranged in the uſual order of the Latin MSS. Matthew, John, Luke, Mark. Dr. Kipling, in a preface to his edition of this MS., has comprized his obſervations upon it under four diſtinct heads, of which we ſhall avail ourſelves in the ſequel of this article. He begins, *firſt*, with eſtabliſhing its high *antiquity*. It is univerſally allowed, by the moſt competent judges, that this MS. is one of the moſt ancient. Thoſe who give it the leaſt antiquity aſſign it to the 6th or 7th century. Wetſtein and I. D. Michaelis deem it much older: and Dr. Kipling is of opinion, that it is more ancient than the Alexandrian MS. and muſt have been written in the ſecond century. His conjecture is founded on theſe circumſtances; that it wants the doxology at the end of the Lord's prayer, and has the Ammonian ſections, without the Euſebian canons. That the doxology is an interpolation, admits of little doubt; but it is not ſo clear how the want of it in a MS. furniſhes a proof of the high antiquity of that MS. If the writer of Beza's MS. were a Latiniſt, he might leave out the doxology in his Greek copy, becauſe it was not in his Latin copy; or his Greek copy might have been one of thoſe which wanted the doxology. Dr. Kipling's argument, derived from the entire omiſſion of the Euſebian canons, and from the Ammonian ſections being added by a poſterior writer, is more ſpecious. Hence he infers, that the text of the MS. was written antecedently to the date of the Ammonian ſections, and theſe before the Euſebian canons appeared. Ammonius lived in the third, Euſebius in the fourth century: the Ammonian ſections in Beza's MS. are much poſterior to the text, and are without the canons of Euſebius; therefore it is highly probable that thoſe ſections were added to the MS. before the fourth, and that the MS. itſelf was written before the third century. However, a MS. of the 5th, 6th, or 7th century might have been written, in uncial letters, without either the marginal ſections of Ammonius, or the canons of Euſebius; and the former might have been added without the latter ſome years after that period. This argument has been applied by Grabe, Caſley, and Woide to the Codex Alexandrinus (See ALEXANDRIAN *copy*), and by Hichtel to the Codex Vaticanus. It deſerves to be further illuſtrated and examined. In MSS. of the New Teſtament, the four Goſpels are divided into greater and ſmaller portions; the one called τιτλος, the other κεφαλαιον; in the ſame manner, though in different proportions, as we divide them into chapters and verſes. The τιτλοι, or larger portions, were generally marked in the upper margin; the κεφαλαια, or, as they are frequently called, the Ammonian ſections, were always marked at the ſide; and to theſe ſections Euſebius adapted his ten tables, or harmony of the Goſpels, to which he referred by writing, under each of the Greek letters or numbers expreſſive of the Ammonian ſections, letters which denoted that part of each table where the ſection was to be ſought. This is clearly exhibited either in Stephens's edition of 1550, or in Kuſter's edition of Mill's Greek Teſtament. The Acts of the Apoſtles, and the Epiſtles, were likewiſe divided into ſections, called, from the inventor, the ſections of Euthalius; and they were noted in the margin by letters, in the ſame manner as the Ammonian ſections in the Goſpels. As the Euthalian ſections are not marked in the margin of the Acts of the Apoſtles, and the Epiſtles, in the Alexandrian copy, though the τιτλοι and κεφαλαια are noted in the Goſpels, Grabe, Caſley, and Woide, contend, that the Alexandrian copy was written before Euthalius had introduced theſe ſections, that is, before the year 396. Mr. Marſh, however, (ubi infrà) obſerves, that a conſiderable time might have elapſed after the year 396, before theſe ſections were brought into general uſe. Beſides, though no ſections are marked in the margin of the Alexandrian copy, in the Acts, and the Epiſtles, yet the text itſelf is very diſtinctly divided into ſections, by blank ſpaces at the end of each ſection, and by large letters written in the margin, at the beginning of each ſection. The diviſions into ſmaller portions was probably later than the diviſion into larger portions; and the portions into which the Acts of the Apoſtles are divided in the Alexandrian copy, appear to be nothing more than a ſubdiviſion of the Euthalian ſections. Upon the whole, ſays Mr. Marſh, the writer of the Codex Alex. ſeems to have been unacquainted with the Euthalian diviſion, and Woide's argument is indeciſive. In applying the ſame argument to Beza's MS. the ſame objection will occur. For though no ſections are noted in the margin, yet the text itſelf is divided into ſections, not by blank ſpaces, as in the Alexandrian copy, but by the firſt word of each ſection being ſo written, that the firſt letter ſtands in the margin, which is ſometimes greater, but in general of the ſame ſize with the other letters. It appears, on an examination of Beza's MS., that whenever an Euthalian ſection commences in the Alexandrian MS. a new ſection begins in Beza's MS., and that the ſections of theſe two MSS. in the Acts of the Apoſtles, are only different ſubdiviſions of the Euthalian ſections. This argument, therefore, inſtead of being favourable to theſe MSS., rather proves, that neither of them was written before the fifth century.

Moreover, the τιτλοι of Euſebius are wholly unnoticed in the margin of Beza's MS.; and the κεφαλαια, or Ammonian ſections, are not accompanied with the references to the canons of Euſebius. This is obſerved by Mill, in his "Prolegomena," who aſcribes the omiſſion of theſe references to forgetfulneſs; but this, ſays Mr. Marſh, cannot have been the reaſon, becauſe the ſections are ſometimes written ſo cloſe together, as to leave no room for a reference between them. This ingenious writer expreſſes his ſurpriſe that Mill did not deduce this very obvious inference from the omiſſion of theſe references to the canons of Euſebius, viz. that Beza's MS. was written, not indeed before the time of Euſebius, but before the tables which he invented were brought into general uſe; and as Euſebius was a man of ſo diſtinguiſhed a character, and we know that Jerom himſelf adopted theſe canons, we might ſuppoſe, that they were generally adopted within 100 years after their invention. But the true reaſon why Mill did not apply this argument, was his having ſeen ſeveral other MSS. of the goſpels beſides Beza's copy, which have the Ammonian ſections without the references to the canons of Euſebius. Their abſence, therefore, from the Codex Bezæ affords no abſolute proof of its antiquity. Beſides, the Ammonian ſections in Beza's MS. are noted in the margin by a different, and, of courſe, later hand, than that which wrote the MS. itſelf. This is aſſerted by Mill, Wetſtein, and Grieſbach, who have all examined the MS. Although the Ammonian ſections are noted in the margin with the ſame uncial letters as are uſed in the text, and the ink is in both places of the ſame tawny colour; yet the letters in the margin are ſomewhat ſmaller than thoſe in the text, and ſome of the former, when cloſely examined, manifeſtly differ from thoſe in the latter. Inſtances to this purpoſe are produced by Mr. Marſh. It is certain alſo, he adds, that the writer of the Codex Bezæ did not intend that the text ſhould be divided into the Ammonian ſections; for he has actually divided it into ſections of a totally different kind. They are denoted by the firſt word of each ſection projecting into the margin; ſo that the firſt letter ſtands out of the text, but is contiguous to the ſecond letter, and is generally of the ſame ſize with the reſt, though it is ſometimes larger. A further proof that the writer of the Codex Bezæ did not intend to mark the Ammonian ſections is, that an Ammonian ſection frequently begins in the middle of the line; whereas thoſe above mentioned commence always at the beginning of the line. And though the perſon who added the Ammonian ſections has conſtantly added two dots (:) before the word which begins the ſection, yet the interval is frequently ſo ſmall between it and the preceding word, that he was obliged to add them nearly at the top of the letter. What argument then can be deduced from the above-mentioned omiſſion, in reſpect to the antiquity of Beza's MS.? If we conclude that it was written before the invention of the Ammonian ſections, we ſhall refer it to the beginning of the third, or the end of the ſecond century; againſt which it may be objected, that the concluſion would be too haſty, becauſe a conſiderable time might have elapſed before their uſe was become general. But as theſe diviſions were adopted and recommended by Euſebius in the fourth century, and likewiſe by Jerom at the end of the ſame, and beginning of the following century, they muſt have been univerſally known before the cloſe of the fifth; and though it may be ſaid that the writer of the Codex Bezæ muſt have copied from ſome more ancient MS., and might therefore tranſcribe the old, long after the new diviſions were introduced, we may reply, ſays Mr. Marſh, that as the Codex Bezæ is written in a ſplendid and expenſive manner, it is probable, that the perſon or perſons for whom it was written, would have choſen that ſuch chapters or ſections ſhould be obſerved in it, as were in general uſe at the time when it was written. If we argue, therefore, from the omiſſion of the Ammonian ſections, we may fairly conclude, that the Codex Bezæ is at leaſt as ancient as the fifth century. But as the writer of this MS. has adopted ſections in the Acts of the Apoſtles, which imply the previous exiſtence of the Euthalian ſections, we would not, ſays Mr. Marſh, aſcribe to it a greater antiquity. If we argue, ſays this judicious critic, from the internal evidence of the text, and conclude from the antiquity of its readings, that is, from the circumſtance that the Codex Bezæ is free from many ſpurious additions and alterations, that were introduced into the more modern Greek MSS.; the inference deducible is, not that the MS. itſelf is ancient, but only that it has a very ancient text, which is a matter of much greater importance than the antiquity of the vellum and the ink. It is certain that it was written before the eighth century, from the ſhape of the letters, the want of intervals between the words, and alſo of accents and marks of aſpiration; for in the eighth century, the Greek uncial letters degenerated from the ſquare and round form, which is ſeen in the Codex Bezæ, into an oblong ſhape; marks of aſpiration, and accents were added, and the elegance of writing conſiderably decreaſed. It appears alſo from comparing the letters of the Codex Bezæ with the Greek inſcriptions given by Montfaucon, (Pal. Græc. p. 158—175.) not only that it *muſt* be more ancient than the eighth century, but that it *may* be as ancient as the ſixth, the fifth, or even the fourth century. No inſcription reſembles it ſo exactly, as to the ſhape of its characters, as that given by Montfaucon, which was engraved about the middle of the ſixth century, in the reign of Juſtinian. But this is no argument againſt its higher antiquity. Upon the whole, from comparing the Codex Bezæ with Greek inſcriptions of different ages, we may conclude that it cannot have been written later than the ſixth century, and that it may have been written even two or three centuries earlier. The tawny colour of the ink diſcovers, indeed, the higheſt antiquity: but no great ſtreſs can be laid on this circumſtance, becauſe, if two MSS. were written with the ſame ink, the one in the fourth, the other in the ſixth century, they would probably be faded at preſent in a nearly equal degree; and the difference between 12 and 14 hundred years would hardly be ſufficient to enable us to diſcover at preſent any difference in the colour; not to add, that as ſome inks are more durable than others, the letters of a modern MS. may be more faded than thoſe of a more ancient MS. With reſpect to the comparative antiquity of the Codex Bezæ with that of other MSS., it may be ſafely aſſerted, that no one can be put in competition with it, except the Codex Vaticanus. The moſt ancient Greek MSS., meaning thoſe only which are quoted by Wetſtein, beſides theſe two, have, according to him, the uſual τιτλοι and κεφαλαια. We may therefore ſuppoſe, that thoſe which have more ancient diviſions, and have other marks denoting the greateſt antiquity, are in this reſpect entitled to the higheſt rank. If it is aſked to which of theſe the precedence is due, Mr. Marſh replies, to the Codex Bezæ; for the Codex Vaticanus has accents and marks of aſpiration which were added by the perſon who wrote the MS. itſelf.

The *ſecond* object to which Dr. Kipling directs his attention is the *nature* and *excellence* of Beza's MS. Antony Arnauld maintains, that it is a forgery of the 6th century, and therefore, unworthy of credit; and his chief argument for this unfounded opinion is, that it has additions or interpolations, which are not found in the copies anterior to that period: but this aſſumption is not juſt, for it is very far from being certain that the ſame and ſimilar interpolations were not found in any other MS. before the 6th century. Dr. Kipling, on the other hand, alleges, by a method of reaſoning not very ſatisfactory, that the additions above mentioned are proofs that either the MS. of Beza, or its archetype, muſt have been written before Jerom corrected the text of the New Teſtament, becauſe they are not in his verſion. Bengelius ſuppoſes this MS. to be of Britiſh manufacture, from its very great conformity with the Anglo-Saxon verſion; and that it was reformed, or rather depraved, by means of the Italic verſion. To which it is replied, that the MS. of Beza reſembles the Syriac verſion as much as it does the Italic and Anglo-Saxon; and, therefore, it may as juſtly be called a Syriacizing MS. as a Latinizing one. In this connection we may obſerve, that according to the opinion of Wetſtein, in which he was generally followed, till Semler queſtioned it, the Codex Bezæ contained a Greek text which was altered from the Latin; or, in other words, that the writer of the Codex Bezæ departed from the readings of the Greek MS. or MSS. from which he copied, and introduced in their ſtead, from ſome Latin verſions, readings which were warranted by the authority of no Greek MS. Allowing as a fact, that a great number of the readings peculiar to the Codex Bezæ are found in the Vulgate, and that they are found in no Greek MS. at preſent known, and that with regard to moſt of the readings, in which the Codex Bezæ differs from all the Greek MSS., it agrees with ſome one of the Latin verſions publiſhed by Blanchini; ſhall we hence conclude, that theſe readings were actually borrowed from a Latin verſion, and tranſlated into Greek? It is at leaſt as poſſible, ſays Mr. Marſh, that they might have had their origin in the Greek, as in the Latin: and this poſſibility is ſufficient to defeat the whole of Wetſtein's hypotheſis. Beſides, it is highly probable, as well as poſſible, that this might be the caſe. It is merely more reaſonable to ſuppoſe, that a tranſlation would be altered from an original, than an original from a tranſlation: and this ſuppoſition is confirmed by fact, for when Jerom reviſed the Latin verſion by order of pope Damaſus, he corrected it from Greek MSS. Beſides, the Codex Bezæ has additions, omiſſions, and tranſpoſitions, which are found neither in the Vulgate nor any other Latin verſion now extant. Since, therefore, the Latin verſions of that MS. agree with the Greek text, even in places where it is ſupported by no Latin MS. at preſent known, we muſt conclude, that the Latin was adapted to the Greek, and not the Greek to the Latin. That the Codex Bezæ ſhould agree, either with the Vulgate, or ſome other Latin verſion, is not extraordinary, when we reflect, that this MS. is one of the oldeſt now extant, and that the Greek MSS., from which the Latin verſions were made, come nearer to it, in point of time, than to thoſe Greek MSS. from which the Codex Bezæ differs. To this muſt be added, that a great number of theſe readings are found in the Syriac, the Coptic, the Sahidic, the margin of the Philoxenian verſion, the Verſio Syra-Hieroſolymitana, and the quotations of Origen. And we muſt ſuppoſe that all theſe have been corrupted from the Latin; if the charge be true, with reſpect to the Codex Bezæ. There is no reaſon whatever for aſcribing any reading of a Greek MS. to the influence of the Latin, unleſs it can be proved, that it could not have taken its riſe in the Greek, and that it might eaſily have originated in the Latin. But no inſtance of this kind has been produced from the Codex Bezæ. Michaelis mentions two inſtances out of many more which might be produced, which ſeem to reſcue the copyiſt from the charge of having corrupted the Greek from the Latin. 1. The Greek text varies ſometimes even from the Latin verſion, with which it is accompanied. 2. The Latin text appears, in ſome caſes, to have been altered from the Greek. We ſhall only add, under this head, that as the Codex Cantabrigienſis was probably written in Europe, as appears from its being accompanied with a Latin tranſlation, it ſeems improbable that the Syriac verſion ſhould be uſed in the correction of a MS. written in a country where the Syriac language was wholly unknown; and the only ſuppoſition that can make the conjecture probable is, that the Greek text of the Cod. Cant. was taken from a Greek MS. written in Aſia. But this conjecture is altogether unneceſſary. Upon the whole, the Biblical critic may probably not demur in ſubſcribing to the judgment of Mill or Semler, as to the utility of this and other ſimilar Græco-Latin MSS.; that they are valuable monuments of antiquity, and exhibit many important readings, to be found in no pure Greek copies, but which are moſtly inſerted in the old Italic verſion, and in the works of the Latin fathers.

As to the Latin verſion, annexed to the Greek of Beza's MS., it is evidently the old Italic, before it was corrected by Jerom. It is, in general, an exact counterpart of the original, from which it rarely deviates. The intention of the writer, whoever he was, ſeems to have been to make his Latin copy tally with the Greek. That he adapted his Latin verſion to his Greek text is clear from many paſſages that might be adduced. On the other hand, the writer of Beza's MS. ſometimes, though not ſo frequently, adapted his Greek text to ſome Latin copy. In John, v. 2. the Greek has Βελζεθα inſtead of Βηθεσδα, which reading, it is probable, was never found in any pure Greek copy of St. John: but it is the Latin reading of Corby's MS. as well as of Beza's; to which the former bears throughout a ſtrong reſemblance. Dr. Kipling imagines, for reaſons which he alleges, that the Latin verſion in Beza's MS. is not all written by the ſame hand.

The *third* object of Dr. Kipling's reſearch is the *peregrinations* of the Cambridge MS., which he traces from Egypt to Cambridge. We ſhall, with Michaelis, invert the order of this route, becauſe our knowledge of it in later times is certain; whereas the higher we aſcend, the greater is the obſcurity in which we are involved, till at length we loſe ourſelves in the maze of thoſe unwarranted conjectures that have been hazarded by Wetſtein. It is a 4to ſize, and written on vellum; 66 leaves of it are much torn and mutilated, ten of which are ſupplied by a later tranſcriber. In 1581, the Univerſity of Cambridge received this MS. as a preſent from Theodore Beza, who then reſided at Geneva. It had been in his poſſeſſion about 19 years; and was found, according to his account, in the monaſtery of St. Irenæus at Lyons, in the year 1562; from which period he made uſe of it till the year 1581, and has frequently quoted it in his edition of the Greek Teſtament, publiſhed in 1582. Beza wrote, in the beginning of this MS., the following account with his own hand. "Eſt hoc exemplar venerandæ vetuſtatis ex Græciâ, ut apparet ex barbaris quibuſdam Græcis ad marginem notatis, olim exportatum, et in S. Irenæi monaſterio Lugdunenſi, ita, ut hic cernitur, mutilatum, poſtquam ibi in pulvere diù jacuiſſet, repertum, oriente ibi civili bello, Anno Domini 1562." He gives the ſame account in his letter to the Univerſity of Cambridge, dated Genevæ, Id. Decemb. 1581; and alſo in the page preceding the preface to his edition of the Greek Teſtament, printed in 1582.

That the MS. came originally from Greece is conjecture; but that it was diſcovered in the monaſtery of St. Irenæus, at Lyons, depends upon the direct and poſitive evidence of a man, whoſe veracity we have no reaſon to doubt. Wetſtein aſſerts, and it has been ſtrenuouſly maintained by others, that the Cod. Cantab. and the Codex β. Stephani, which, as he relates, ſome of his friends had collated in Italy, for his edition of the New Teſtament, in 1550, are one and the ſame MS. Beza, however, quotes them as totally diſtinct; but in the opinion of Michaelis very obvious circumſtances decide in favour of Wetſtein. Mr. Marſh, without deciding on the queſtion, impartially ſtates the arguments on both ſides, and leaves the determination to the reader. In favour of the opinion, that they are one and the ſame MS. Wetſtein alleges, 1. That the Lectiones ſingulares, amounting to 450, quoted in Stephens's Margin from the Codex β. agree exactly with thoſe of the Codex *Bezæ*, except in ſome few inſtances, which appear to be typographical errors. 2. That where the Codex Bezæ has chaſms, no readings are quoted in Stephens's Margin from the Codex β; though, if we except theſe chaſms, the Codex β is quoted by Stephens in every page. 3. That ſeveral remarkable additions to the common text, found only in the text of the Codex Bezæ, are quoted by Stephens from his Codex β. Againſt theſe arguments the following objections may be urged: 1. The Lectiones ſingulares, quoted from the Codex β. do not amount to 450, but only to 211. 2. To the ſecond argument it may be replied, that the premiſes are not perfectly true, for the Codex β. is actually quoted by Stephens in four inſtances, where the Codex Bezæ has a chaſm. In favour of the opinion, that the Codex Bezæ and the Codex β. are two diſtinct MSS. may be alleged the following arguments: 1. It appears from the direct and poſitive evidence of Beza, given clearly and conſiſtently at three different times, that his MS. of the Goſpels and Acts was diſcovered in the monaſtery of St. Irenæus, at Lyons, in 1562, and that from the intelligence he could procure, it had lain there time immemorial. If this account be true, the Codex Bezæ could not poſſibly have been collated in Italy by Henry Stephens fifteen years prior to that period, and the MS., which Stephens collated muſt now lie buried in ſome Italian library. 2. Henry Stephens, who collated the Codex β. lived in habits of intimacy with Beza, and printed ſome of his editions of the Greek Teſtament; and muſt unavoidably have been led by the ſame curioſity, which induced him to examine every Greek MS. which he could procure, to inſpect, at leaſt, the two celebrated MSS., which Beza uſed in his edition of 1582, and in which H. Stephens himſelf wrote the "Exhortatio ad Lectorem." If, therefore, Beza's MS. of the Goſpels and Acts had been the very ſame which he himſelf had collated a few years before, he muſt have recognized ſo remarkable a MS., and of courſe would have mentioned it to Beza. But Stephens has no where given a hint of its being the ſame, though he had a fair opportunity of doing it, where he ſpeaks of the MS. which he himſelf had collated, *viz.* in the preface to the edition of the Greek Teſtament of 1587, printed three years after Beza's third edition; and Beza conſtantly quotes it as a different MS. from the Codex Stephani β. 3. In four inſtances, where the Codex Bezæ is defective, Stephens quotes readings from his Codex β. 4. The author of the "Specimen Animadverſionum in Prolegomena Wetſtenii," has produced twenty readings, in which the Codex Bezæ and the Codex β. contradict each other. 5. Though the characteriſtic readings of the Codex β are found in general in the Codex Bezæ, yet, on the other hand, there are ſome very long and remarkable readings in the Cod. Bezæ, which Stephens has not quoted from his Codex β. To theſe arguments for the diverſity of the MSS. it may objected, 1. That Beza's poſitive evidence can go no further than to the place where, and the time when, the MS. was found, not to the number of years, during which the MS. had been preſerved there. 2. That though H. Stephens, who collated the Codex β, and muſt frequently have ſeen the Codex Bezæ, has no where aſſerted that they were one and the ſame MS., yet the argument drawn from his ſilence is only negative, and that arguments of this kind are not always concluſive. But it is more difficult to find an anſwer to the other part of this argument, *viz.* that Beza had conſtantly quoted the two MSS. as diſtinct; which he hardly would have done, if Henry Stephens had ever obſerved that they were one and the ſame. Wetſtein, however, who takes for granted, that H. Stephens actually informed Beza that they were one and the ſame MS. goes ſo far as to accuſe Beza of a wilful intention to deceive. 3. That the four quotations from the Codex β, in the two places where the Codex Bezæ has a chaſm, may be explained, either on the ſuppoſition, that two leaves, which are now wanting, have been loſt ſince Stephens's time, or as typographical errors. 4. That the argument drawn from the contradictions referred to is inconcluſive, becauſe many inſtances may be produced of collations made by different perſons from the very ſame MS. which contradict each other much more frequently than the extracts from the Codex β. contradict the readings of the Codex Bezæ. 5. That the fifth argument is not abſolutely deciſive, ſince it is poſſible that H. Stephens might overlook the moſt remarkable readings, even in places where we ſhould leaſt expect it; and likewiſe poſſible, if he had noted them, that the ſame remarkable readings might have been overlooked both by R. Stephens and Beza. Michaelis, who adopts the common hypotheſis, that the Codex Bezæ and the Codex Stephani β. are one and the ſame MS., is reduced to the neceſſity of ſuppoſing, that the MS. which Henry Stephens collated in Italy, not long before the year 1550, was afterwards depoſited in the monaſtery of St. Irenæus, and there diſcovered in 1562: though Beza declares expreſsly, that it had lain there time immemorial. Dr. Semler conjectures, that the Codex Stephani β. might have been a tranſcript of the Cod. Cant. and brought to Italy a ſhort time before it was collated. Wetſtein conjectures, that the Codex Bezæ was either preſerved during ſome time at Trent, or that Henry Stephens, after having collated it in Italy, delivered it to the biſhop of Clermont, at the time when the celebrated council was held there, in 1546, and that the biſhop brought it from the council to his dioceſe of Clermont in Auvergne. Theſe two parts of Wetſtein's hypotheſis directly contradict each-other; for it appears, from Mattaire Hiſt. Stephanorum, that H. Stephens did not go to Italy till after the death of Francis I. which happened in 1547. He could not, therefore, deliver it to the biſhop of Clermont, at Trent, in 1546; and if the biſhop was in poſſeſſion of the Codex Bezæ, and brought it home with him, which we muſt ſuppoſe, if it was diſcovered at Clermont in Auvergne, in 1562, it cannot poſſibly have been the MS. which H. Stephens collated in Italy, between the years 1547 and 1550. Wetſtein ſuppoſes, that Beza's MS. was found in France about the year of Chriſt 840, and that it is the ſame copy which Druthmar, an ancient expoſitor, who lived at that period, had ſeen, and which, he obſerves, was aſcribed to St. Hilary. In this MS. the Latin arrangement of the Goſpels was obſerved; but this of itſelf is not ſufficient to prove its identity with Beza's, as 600 years ago there were other Greek MSS. beſides the Cod. Cant. in which this order was followed. Beſides, Semler has juſtly obſerved, that this MS. is Latin as well as Greek; and moreover it contains the Acts of the Apoſtles, which Druthmar has not related of his MS. Wetſtein pretends to have diſcovered the Cod. Cant. among thoſe which were collated at Alexandria, in 616, for the New Syriac Verſion, becauſe he found a coincidence in ſeveral readings: but it is highly improbable, that a Latin tranſlation would be added to Egyptian MSS. of the New Teſtament.

As to the place where this MS. was originally written, Simon, Mill, Wetſtein, Michaelis, and moſt other critics, contend that it was written in the weſt of Europe, where Latin was better underſtood than Greek, ſince a tranſlation would have been wholly ſuperfluous, if the MS. had been written when the original language of the Greek Teſtament was the language of the country. Some have ſuppoſed without ſufficient reaſon, that it was written by a Latin ſcribe; but this ſuppoſition is needleſs, becauſe it is highly probable, that in Italy or ſome other part of the weſt of Europe, where Latin was ſpoken, and where this MS. was written, Greek ſcribes were employed for copying Greek books. This opinion is ſupported not only by Simon, Mill, Wetſtein, Michaelis, &c. but it is likewiſe defended by Montfaucon, of whom Mr. Marſh ſays, he is one of the beſt judges of antiquity that ever exiſted. There is no preſumption whatever, a priori, ſays the ingenious writer juſt mentioned, againſt the opinion, that the Codex Bezæ was written in the weſt of Europe; and it is conſidered highly probable by the two following circumſtances: 1. The Latin tranſlation was added with no other view, than as a means of making the original intelligible to thoſe who were not ſkilled in the Greek; and it was not added merely in conſequence of the high authority of the church which uſed it. For in that caſe the tranſcriber would have adopted ſome eſtabliſhed text, from which he would never have deviated; whereas the Latin text of the Codex Bezæ is found in no Latin MS. either ancient or modern. It has omiſſions, inverſions, and interpolations, agreeing with the Greek text to which it is added, but differing from all other MSS. whether Greek or Latin. This tranſlation would have been altogether ſuperfluous, if the MS. had been written for the uſe of a Greek, and ſtill more ſo, if written in Egypt, as Father Georgi ſuppoſes, where Latin was unknown. 2. The goſpels, in the Codex Bezæ, as we have already obſerved, are written in the following order, Matthew, John, Luke, Mark; which arrangement was never admitted by the Greek church, or in any country ſubject to its authority; but it was the common arrangement of the ancient Latin MSS. as appears from the Evangelarium Quadruplex, of Blanchini. From all theſe circumſtances it ſeems reaſonable to conclude, that the Codex Bezæ was written in the weſt of Europe, in a country where the Latin was better underſtood than Greek, and which was ſubject to the authority of the church of Rome. A MS written in one country may be eaſily tranſported into another; the Codex Alexandrinus, in the compaſs of a few years, was in Alexandria, Conſtantinople, and London; and that the Codex Bezæ has been ſubject to ſeveral migrations is not improbable from the various corrections both in the Greek and the Latin texts. Another hypotheſis has been propoſed, which will ſolve the ſeveral phenomena relative to the Codex Bezæ, as eaſily, or perhaps more ſo, than the preceding, viz. that it was written either at Conſtantinople, or in ſome city of the Greek empire in Europe, for the uſe of ſome perſon or community belonging to the Latin church, between the time of Conſtantine, and the final ſeparation of the Greek and Latin churches. During this period, it is probable that many Latin families removed from Italy, and ſettled in ſome of the principal cities of Greece; and perhaps whole communities attached to the Latin church exiſted in Conſtantinople for a conſiderable time after the removal of the ſeat of empire. It is alleged that the Codex Bezæ is exactly ſuch a MS. as we may ſuppoſe to have been written for the uſe either of a Latin community, or ſome perſon of diſtinction, ſettled in a city of the Greek empire. It was brought perhaps towards the cloſe of the Greek empire from Greece into Italy, where it was collated by Henry Stephens, if it is the ſame as the codex Stephani β. before it came into the hands of Theodore Beza. If we argue from the readings of the Codex Bezæ, to the place where it was written, we may conclude, that it was written either in Syria or in Egypt; for in many inſtances, where it departs from all other Greek MSS. it agrees with the old Syriac, the marginal readings of the new Syriac, the Coptic verſion, and the quotations of Origen. We need therefore, ſays Mr. Marſh, make only one addition to the laſt mentioned hypotheſis, an addition which agrees with the opinion of Dr. Semler, and we ſhall ſolve every phenomenon relative to the MS. in queſtion: viz. that the writer of the Codex Bezæ uſed ſeveral Greek MSS. from which he ſelected thoſe readings which appeared to him to be the beſt; and that one of theſe MSS. was of the Alexandrine edition. Semler has inſtituted a compariſon between the Cod. Cant. and the Coptic verſion, alſo with the Ethiopic, the Armenian, and the Alexandrian fathers; and the reſult of this inquiry is, that the Greek text of the Cod. Cant. belongs to the Alexandrine edition, and that the original from which it was copied was written in Egypt. With reſpect to the *uſe* that has been made of Beza's MS. we have already obſerved, that Stephens made extracts from it, though with no great accuracy, under the title Codex β. for the edition of the Greek Teſtament of 1550, and likewiſe Beza for his own edition, publiſhed in 1582. From his and the CLERMONT copy of St. Paul's Epiſtles, he publiſhed in this year his larger annotations. Since it was ſent to the univerſity of Cambridge, it has been more accurately collated by Junius. A fourth, and much more accurate collation of it was made at the inſtigation of Uſher, and the extracts were inſerted in the 6th volume of the London Polyglott. Mill collated it a fifth and ſixth time; but that his extracts are likewiſe frequently defective and ſometimes erroneous, appears from comparing them with Wetſtein's New Teſtament, and from a new collation that was made about the year 1733 by Mr. Dickenſon of St. John's college, which collation is at preſent in the library of Jeſus's college, where it is marked O Θ. 2. In Wetſtein's extracts are alſo many errors, as appears from comparing them with the MS. itſelf. As he took a copy of it, he probably collated, not the original while he was at Cambridge, but his copy after his return. Adler in his "Verſiones Syriacæ" has collated the "Verſio Syra Hieroſolymitana" with the readings of the Cod. Cant. and diſcovered in it 11 readings, that exiſt in no other Greek MS. now extant, 14 which are found only in one or two MSS. beſide the Cod. Cant. and 54 which are common to the Cod. Cant. and ſeveral other MSS. For this reaſon Dr. Harwood, in his edition of the Greek Teſtament, publiſhed in London in 1776, has regulated his text in the Goſpels and the Acts, chiefly according to the readings of the Cambridge MS. The copy which Wetſtein took of Beza's MS. in 1716, is not the only tranſcript which has been made of it; for Simon in his preface to the "Hiſtoire Critique du Texte du Nouv. Teſtament," relates, that he himſelf had a copy which had been ſent him from Cambridge. There is alſo a third copy which is preſerved in the library of Trinity college in Cambridge, and marked B. 10, 3. It is written on vellum, in ſmall characters with accents and marks of aſpiration. It is a large quarto, containing only the Greek text. This tranſcript muſt have been made ſome time in the 17th century. In the year 1787, the univerſity of Cambridge reſolved to print the whole MS. in letters of the ſame form and magnitude as the original hand-writing, and committed the publication to the care of Dr. Kipling. Accordingly this fac-ſimile was printed at Cambridge in 1793 in 2 vols. folio, under the title of "Codex Theodori Bezæ, Cantabrigienſis Evangelia et Acta Apoſtolorum complectens, quadratis literis, Græco-Latinus." The price to ſubſcribers was two guineas per vol. This work is printed in a ſplendid form: the paper is ſuperfine; the types are admirably cut; the ink is of uncommon blackneſs; and the impreſſion is ſcarcely paralleled. In theſe reſpects it ſurpaſſes Dr. Woide's fac-ſimile of the Alexandrian *copy*; but whether it does not yield to its Alexandrian rival in other particulars, we leave to the deciſion of competent judges. It is, however, a very valuable addition to the library of the Biblical critic. See Wetſtein's Prolegomena to his folio edition of the New Teſtament, vol. i. p. 28. Kuſter's edition of Mill's Teſtament, Proleg. p. 132. Mill Præf. in New Teſtament, Amſt. 1735. Kipling's Pref. Michaelis's Introd. to the New Teſtament. by Marſh, vol. ii. iii.

There are alſo other MSS. at Cambridge, for an account of which ſee Michaelis's Introd. by Marſh, ubi ſupra.

CAMBRIDGESHIRE, in *Geography*, is the name of one of the inland counties of England, having parts of Northamptonſhire, Huntingdonſhire, and Bedfordſhire, on the north-weſt, with Hertfordſhire, and Eſſex on the ſouth; Suffolk on the eaſt; and Norfolk on the north-eaſt. This tract of the iſland, with Suffolk and Norfolk, were inhabited, before the deſcent of the Romans, by a claſs of the Britons called Cenomanni, or Cenimaqui, one of the nations of the Iceni. Under the Romans, it formed a part of Flavia Cæſarienſis, and the Saxons made it a part of Eaſt Anglia. After various revolutions it was incorporated in Weſſex. By the latter people it was called Grantabrygſcyr, from the river Granta, which waters part of this diſtrict. The greateſt length of this county is about fifty miles; its greateſt breadth at the ſouthern extremity is ſomething more than twenty-five: its circumference is about 138. It contains nearly 443,300 acres, is divided into 17 hundreds, and has one city, ſix market-towns, 163 pariſhes, 16,451 houſes, and about 89,400 inhabitants, of whom 28,654 are perſons chiefly employed in agriculture, and 11,988 employed in trade, manufactures, and handicraft. The proportion of males to females is 44,081 to 45,265. The limits on the northern half are chiefly rivers and their communicating branches; on the ſouthern, the boundaries are wholly artificial. The principal rivers of Cambridgeſhire are the Ouſe and the Granta, or Cam. The former enters the county between Fenny Drayton and Erith; thence it runs eaſtward through the fens, till, at ſome diſtance above Denny abbey, it aſſumes a northerly direction, and paſſing Stretham, Ely, and Littleport, flows into Norfolk. The latter has three branches, the chief of which riſes near Aſhwell in Hertfordſhire; and enters this county to the weſt of Gilden-Morden, thence flowing to the north-eaſt, it receives ſeveral rivulets; and near Grantcheſter has its current enlarged by the united waters of its ſiſter ſtreams, which flow into this county from Eſſex. Hence, taking a northerly courſe, it glides through the gardens of the principal colleges at Cambridge, and having paſſed ſeveral villages, falls into the Ouſe at Harrimere, in the pariſh of Stretham. Beſides theſe rivers, whoſe channels appear to have been marked out by nature, there are numerous ſtreams in the northern part of the county, which were ſuggeſted by the conveniences, and formed by the induſtry of man. Theſe interſect the land in various directions; and by carrying off the ſurplus waters of the fens, have been the means of bringing many thouſand acres into cultivation. The chief drains are the old and new Bedford rivers, which are navigable for upwards of twenty miles, in a ſtraight line acroſs the county from Erith to Denver. A conſiderable part of the county on the northern and north-weſtern ſides, is occupied by the fens which conſtitute a part of the great Bedford level. It appears from the agricultural ſurvey of the county, that upwards of one third of Cambridgeſhire, or 150,000 acres, are ſtill in the condition of waſte and unimproved fen, the average value of which is little more than four ſhillings an acre. This is a full proof that the immenſe labour employed in the draining of the level, has not been attended with the ſalutary effects which the promoters of the various plans too fondly imagined. The towns and villages in the northern diviſion of the county, from the elevated ſpots on which they are built, appear like iſlands riſing from the midſt of low and level marſhes; and the churches, being generally on the higheſt parts, may be diſtinguiſhed at the diſtance of ſeveral miles. The cottages are in many places nothing more than mud walls covered with thatch. The application of the land is various. In thoſe parts which have been preſerved from the floods, or are only ſubject to occaſional overflowings, it has all the fertility of water meadows. The crops of oats are particularly exuberant, the produce being frequently from forty-five to ſixty buſhels an acre. Great quantities of wheat and cole-ſeed are alſo grown, and generally with a proportional increaſe. Many thouſand acres, particularly on the north-weſtern ſide, are appropriated to paſture. In the neighbourhood of Elm, Upwell, Outwell, &c. conſiderable quantities of hemp and flax are grown; but the culture of theſe articles, as a preparation for wheat, does not receive that attention which their importance demands. Some very fine butter is made on the dairy farms in this diſtrict, and is uſually ſold in the Cambridge markets in long rolls, called "yards," one of which weighs a pound. The vicinity of Cottenham is famous for a peculiar kind of new cheeſe, of a ſingularly delicious flavour; the ſuperiority of which is partly aſcribed to the mode obſerved in the management of the dairies, and partly to the nature of the herbage on the commons. In this part of the county many calves are ſuckled for the London markets. The ſalt marſhes in the north-weſtern corner of Cambridgeſhire are remarkably favourable for the growth of corn, but from their peculiar ſituation, their luxuriant produce is too frequently deſtroyed by the floods. The ſouth-eaſtern diviſion, reaching from Gogmagog hills to Newmarket, is bleak, heathy, and thinly inhabited; being connected with that vaſt tract of land, which, extending ſouthward into Eſſex, and northward acroſs Suffolk into Norfolk, forms one of the largeſt plains in the kingdom. This is chiefly applied to ſheep-walks; but ſome of its more fertile portions have been appropriated to the growth of barley. The ſouth and ſouth-weſtern parts of the county, conſiſting principally of elevated land, exhibit a remarkable contraſt to the northern diviſion, and are productive of fine wheat, barley, and oats; though the heaths and commons that interſect theſe diſtricts furniſh ſuſtenance to many thouſand ſheep, chiefly of the Norfolk, and Weſt country breeds. The valley through which the Cam flows from Steeple Morden to Walton, is called the Dairies, from being almoſt wholly appropriated to dairy farms. In ſome of the pariſhes bordering on Eſſex, ſaffron is cultivated. The ſoil of Cambridgeſhire is greatly diverſified. The rich marſhes in the vicinity of Wiſbech, conſiſt of a mixture of ſand and clay, or ſilt; in the fens, of a ſtrong black earth, or moor, lying on a gault or gravel, or turf-moor, and very favourable for the culture of oats and cole-ſeed; in the uplands, of chalk, gravel, loam, and tender clay, and clay upon a gault. The common manures are ſometimes aided by the application of oil-cake duſt, pigeons' dung decayed, woollen rags, ſoot, &c. The drill huſbandry, till lately, had been chiefly employed at Wimpole, on the eſtate of lord Hardwicke, but appears to be faſt ſpreading, and, with the introduction of ſome new agricultural machines, promiſes to become of eſſential ſervice. The rent of farms is generally from 50l. to 350l. per annum; but ſome in the neighbourhood of Wiſbech rent as high as 800l.; and one in the pariſh of Wood Ditton, is occupied at the rent of 1000 guineas yearly. The wood-lands are extremely ſmall, the whole quantity appropriated to timber throughout the county ſcarcely amounting to 1000 acres, and theſe principally ſcattered through the pariſhes of Stackworth, Wood Ditton, Linton, Bartlow, Boxworth, Wimpole, and Madingley. The greateſt part of the land is open field; but incloſures are rapidly taking place, new bills for that purpoſe being applied for, and obtained every ſeſſion of parliament. Manufactures are hardly known in this county; and, with the exception of thoſe perſons who obtain ſubſiſtence by making the celebrated white bricks, and coarſe pottery with the ſame clay, in the neighbourhood of Ely, moſt of the inhabitants are employed in agriculture: others derive ſupport from ſpinning yarn for the Norwich weavers. Cambridgeſhire, with the exception of a few pariſhes on the eaſt and north-eaſt ſide, which belong to the ſees of Norwich and Rocheſter, was taken from the ſee of Lincoln, by Henry the Firſt, in the year 1114, and made into a ſeparate dioceſe for the newly elected biſhopric of Ely. It ſends ſix members to parliament, viz. two for the ſhire, two for the town of Cambridge, and two for the univerſity; pays nine parts of the land-tax, and ſupplies the militia with 480 men. It is included in the Norfolk circuit.

CAMBRIN, a town of France, in the department of the ſtraits of Calais, and chief place of a canton, in the diſtrict of Béthune; the place contains 492, and the canton 15,288 inhabitants: the territory comprehends 90 kiliometres, and 18 communes.

CAMBRISOPOLIS, in *Ancient Geography*, an epiſcopal town of Aſia, in the patriarchate of Antioch, and ſubject to the metropolis of Anazarbum.

CAMBRO-British Music, national Welch tunes. Theſe ancient melodies, which till the eleventh century ſeem to have been traditional, after that period, were preſerved in writing. See Jones's Muſical and Poetical Relics of the Welch Bards. Theſe airs have a peculiar character, different from the Scotch and Iriſh, and are in high eſtimation with the natives, who have not yet forgiven the Saxons for driving them into the mountains, nor the Engliſh for ſlaying their bards, and robbing the principality of its independence. Moſt of the words which they ſing to their old tunes, are narratives of their ſtruggles for liberty.

CAMBULA, in *Botany*. (Rheed.) See Bignonia *catalpa*.

CAMBURG, in *Geography*, a town of Germany, in the circle of Upper Saxony, and principality of Altenburg; 28 miles W. of Altenburg, and 32 S.W. of Leipſick.

CAMBUS, in *Ancient Geography*, a river of Vindelicia, which commenced S. of Cambodunum, watered this town, and diſcharged itſelf into the Danube to the weſt of Gantia.

CAMBUSUM ostium, the name given by Ptolemy to the moſt weſtern mouth of the Ganges.

CAMBUVII montes, mountains of Greece in Macedonia, mentioned by Livy, who ſays, that the inhabitants of the country were called Voluſtanæ. He places them below the ſource of Aliacmon and near Panyaſus. Theſe mountains ſeparate the Elymiotide territory from Pelagonia.

CAMBYSENA, a country of Albania, between the rivers Cambyſes and Cyrus, and the mountains, according to Strabo. This was one of the prefectures of Armenia.

CAMBYSES, in *Biography*, king of Perſia, was the ſon of Cyrus the Great, and ſucceeded his father in the year B. C. 529. As ſoon as he was ſeated on the throne, he concerted an expedition againſt Amaſis, king of Egypt, who, as ſome ſay, had deceived him with reſpect to the grant of his daughter in marriage; or, according to others, becauſe he refuſed, after the death of Cyrus, to pay the ſame homage and tribute to his ſucceſſor, which he had agreed to render to Cyrus, and attempted to emancipate himſelf from the Perſian yoke. Cambyſes made great preparations for this expedition both by ſea and land: but Amaſis died in the interval of four years, and was ſucceeded by his ſon Pſammenitus. Cambyſes begun with the capture of Peluſium; and in order to ſecure his ſucceſs, had recourſe to the following ſtratagem. Being informed that the whole garriſon conſiſted of Egyptians, he placed in the front of his army a great number of cats, dogs, ſheep, and other animals, which were deemed ſacred by that nation, and then ſtormed the city. The ſoldiers of the garriſon not daring either to fling a dart or ſhoot an arrow for fear of injuring ſome of theſe animals, Cambyſes became maſter of the place without oppoſition. In a ſubſequent battle with the army of Pſammenitus, he proved victorious, and took the king captive. Having purſued the fugitives to Memphis, he ſoon took the place, and becauſe the inhabitants had maſſacred the herald and his retinue, whom he had ſent to require their ſurrender, he cauſed as many of the prime nobility as they had deſtroyed to be publicly executed; and he ordered Pſammenitus to be put to death. Upon this Egypt ſubmitted to the conqueror; and the Libyans, Cyrenians, and Barceans ſent ambaſſadors with preſents to teſtify their ſubjection, and to conciliate his favour. At Sais, which was the burying place of the kings of Egypt, he cauſed the body of Amaſis to be taken out of its tomb, and having expoſed it to various indignities, he ordered it to be burnt, in direct oppoſition to the cuſtoms of the Perſians and Egyptians. In the following year, which was the ſixth of his reign, he determined to make war againſt the Ammonians and Ethiopians, and leaving his Greek auxiliaries to ſecure his conqueſts, he purſued the object of his expedition. As ſoon as he arrived at Thebes in Upper Egypt, he ſent a detachment of 50,000 men againſt the Ammonians, with orders to ravage the country, and to deſtroy the famous temple of Jupiter Ammon; but in their paſſage through the deſert they were overwhelmed by a deluge of ſand and totally deſtroyed. Cambyſes himſelf advanced with the main body of his army towards Ethiopia; but as he had neglected to provide neceſſary ſubſiſtence for his numerous followers, they were ſoon reduced to the moſt dreadful indigence and diſtreſs; ſo that, after having devoured all their beaſts of burden, and every kind of vegetable which they could find, they were under a neceſſity of ſacrificing every tenth man as food for their companions. The king, however, for ſome time perſiſted in his mad deſign; but at length apprehenſive of perſonal danger, he returned to Thebes with the ſhattered remnant of his large hoſt. Here, irritated by his diſappointment, he pillaged the rich and magnificent temples of the city, and ſet them on fire; and it is ſaid that their wealth was ſuch, that the remains that were ſaved from the flames, amounted to 300 talents of gold, and 2300 talents of ſilver. He likewiſe carried away the famous circle of gold that encompaſſed the tomb of king Ozymandias, which is reported to have been 355 cubits in circumference, and to have exhibited the motions of the ſeveral conſtellations. From Thebes he returned to Memphis, where he indulged to its full extent his naturally ferocious and ſavage diſpoſition, by deſtroying the Egyptian prieſts, and the worſhippers of their god Apis, and killing this ſacred ox. To this outrage againſt humanity and the rites of their religion, the Egyptians attributed his ſubſequent inſanity: but his general conduct both before and after this event, afforded ſufficient evidence of his derangement and his cruelty. Jealous of his brother Smerdis, he ordered him to be put to death; and he then married his own ſiſter, Meroe. Having previouſly conſulted the Perſian judges, whether any law ſubſiſted that forbade this inceſtuous marriage, they, diſapproving of the act, but at the ſame time fearful of the king's violent temper, returned this artful reply: "That they had no law indeed which permitted a brother to marry his ſiſter, but they had a law which allowed the king of Perſia to do what he pleaſed." This beautiful and beloved wife taking occaſion to refer to the fate of her brother Smerdis, excited the rage of this brutal prince, ſo that he killed her, though in a ſtate of pregnancy, by a kick in the belly. Another ſavage act of which he was guilty, was that of ſhooting to the heart the ſon of one of his principal officers and favourites, who had in a delicate manner reproved him for his intemperance. Having taking out the heart, which the arrow had pierced, he preſented it to the father, and aſked him in an inſulting manner, "have I not a ſteady hand?" to which the abject parent replied, "Apollo himſelf could not have ſhot better." "Sceleratius," ſays Seneca, after reciting this ſtory from Herodotus, "telum illud laudatum eſt, quam miſſum." About the ſame time, he cauſed ſeveral of his principal followers to be buried alive, and daily ſacrificed ſome or other of them to his wild fury. Crœſus, who remonſtrated againſt theſe proceedings, was ordered to be put to death; and thoſe who delayed executing the royal mandate, under a conviction that the king would repent of it, were ordered to be ſlain, becauſe they diſobeyed his command, though at the ſame time he expreſſed his joy that Crœſus was alive. In conſequence of theſe and ſimilar proceedings, a conſpiracy was formed, during the abſence of Cambyſes from his own country, for ſeizing the throne, by Smerdis, one of the Magi, under a pretence that he was that Smerdis whom his brother had cauſed to be put to death. Cambyſes received this news whilſt he was in Syria, on his return from Egypt to Perſia: and on this occaſion the name of Smerdis excited compunction and terror, whilſt he recollected the fratricide he had committed. He prepared, however, for cutting off the uſurper; but as he was mounting his horſe for this expedition, his ſword ſlipped out of its ſcabbard, and gave him a wound in the thigh, which occaſioned his death in the eighth year of his reign, B. C. 522. Cambyſes is ſuppoſed to be referred to in Scripture, under the name of Ahasuerus. Herodotus, lib. iii. Rollin's Anc. Hiſt. vol. ii. 177.

Cambyses was alſo the father of Cyrus, who is ſaid by Herodotus to have been a Perſian of mean extraction; but by Xenophon to have been a king of Perſia. He married Mandane, the daughter of Astyages.

Cambyses, in *Ancient Geography*, a river of Albania, which roſe in mount Caucaſus, and diſcharged itſelf, after purſuing its courſe between the Albus fluvius and the Cyrus, into the Caſpian ſea.

CAMBYSU, a town ſituate on the Red ſea, in the gulf of Hercopolis, near the place where the Iſraelites paſſed this ſea under the conduct of Moſes. Pliny ſays that it was ſituated between Nelos and Marchadas.

CAMDEBOO, in *Geography*, a loan-farm in the diſtrict of Graaf Reynet, in Southern Africa; which extends along the feet of the ſnowy mountains from the Droſdy to Bruyntjes Hoogté, and is chiefly compoſed of Karroo plains, that are, however, extremely fertile in the chaſms, down which the ſtreams of the mountains conſtantly flow. The oxen are large and ſtrong, and the ſheep little inferior to thoſe of the ſnowy mountains. The beautiful animal, the *Gnoo*, is frequently ſeen bounding over the plains of Camdeboo, and ſpring-boks and harte-beeſts are very plentiful. Barrow's Africa, vol. ii. p. 374.

CAMDEN, William, in *Biography*, an eminently learned antiquarian and hiſtorian, was born in May, 1551, in London, where his father, a native of Litchfield in Staffordſhire, was a member of the company of painter-ſtainers. His mother was of the ancient and reſpectable family of the Curwens in Cumberland. After having received the firſt rudiments of his education in Chriſt's hoſpital, and at St. Paul's ſchool, where he made a very conſpicuous proficiency, he was entered as a ſervitor in Magdalen college, Oxford, at the age of 15 years; and became ſucceſſively a member of Broadgate hall (now Pembroke college) and of Chriſt-church, depending for his ſupport chiefly on the kindneſs of friends, and more particularly on that of his liberal patron, Dr. Thornton, canon of Chriſt church. Failing by the intrigue of the popiſh party to obtain a fellowſhip in the college of All-Souls, and to be admitted bachelor of arts, he removed to London, and proſecuted his ſtudies under the patronage, and by the aſſiſtance of Dr. Gabriel Goodman, dean of Weſtminſter, and his nephew, Mr. Godfrey Goodman, who ſupplied him with both money and books. In 1573 he returned to Oxford, and obtained the degree which he had before unſucceſsfully ſolicited. By the intereſt of his friend dean Goodman, he was appointed, in 1575, ſecond maſter of Weſtminſter ſchool, and diſcharged the duties of that office with great diligence, capacity, and ſucceſs, ſo that he acquired a high degree of reputation among learned perſons both at home and abroad. His leiſure hours at this time were devoted to his favourite ſtudy of antiquities; and with a view to the great work which he afterwards executed, he began to make collections, from every ſource of information to which he could have acceſs, of ſuch materials as might ſerve to illuſtrate the hiſtory and antiquities of Britain. For this purpoſe he made a tour, in 1582, through ſome of the eaſtern and northern parts of the kingdom; and he alſo eſtabliſhed a correſpondence with perſons moſt eſteemed for their learning and judgment, both in his own country and in other nations. The firſt reſult of his reſearches appeared in 1586, under the title of "Britanniæ, ſive florentiſſimorum Regnorum Angliæ, Scotiæ, Hiberniæ, et Inſularum adjacentium ex intimâ Antiquitate Chrographica Deſcriptio;" i. e. "Britain, or a Chorographical Deſcription of the moſt flouriſhing Kingdoms of England, Scotland, and Ireland, with the adjacent Iſlands, from the moſt remote Antiquity," Lond. 8vo. In the dedication of this work to lord-treaſurer Burleigh, Camden gratefully acknowledges the benefits he had derived from his patronage and aſſiſtance. For the further improvement of this work, which was one of the great objects of his life, he took journies into the weſt of England, and alſo into Wales in 1589 and 1590; he conſulted the archives of the kingdom; and he obtained the beſt information he could procure with reſpect to the genealogies and memoirs of ancient families; and he thus enlarged and enriched the ſubſequent editions of his "Britannia," which became ſo popular, that the fourth was printed in 1594, in 4to. In the preceding year he ſucceeded Dr. Edward Grant, who reſigned the office of head-maſter of Weſtminſter ſchool. Notwithſtanding his profeſſional engagements, and his ill health, he employed the intervals that occurred in journies of reſearch and diſcovery, pertaining to his main object. He alſo paid due attention to his office as an inſtructor of youth; for in 1597 he publiſhed, for the uſe of his ſchool, a Greek grammar, which, though not an original work, but an abridgment of a copious one, compoſed by his predeceſſor, Dr. Grant, was highly approved, and long continued to be a ſtandard book. In 1691 this grammar, entitled "Grammatices Græcæ Inſtitutio compendiaria in uſum Regiæ Scholæ Weſtmonarienſis," 8vo. had paſſed through very nearly 100 impreſſions. Camden ſeems to have been ſo much attached to his profeſſion, in the exerciſe of which he was highly eſteemed and reſpected, that, though he was offered the place of a maſter of requeſts, he declined accepting it. But when by the intereſt of ſir Fulk Greville, the vacant poſt of Clarencieux king of arms was conferred upon him, this office was ſo congenial to his taſte and purſuits, and afforded him ſo much leiſure for proſecuting his favourite ſtudies, that he ſurrendered his connection with Weſtminſter ſchool. As he was now more at liberty than when he had the charge of the ſchool, he took a journey, in 1600, into the north, as far as Carliſle, with his friend Mr., afterwards ſir, Robert Cotton; and in the ſame year he publiſhed an account of all the monuments in Weſtminſter abbey, with their inſcriptions, &c. In this year alſo appeared the fifth edition of the "Britannia," with an apology annexed to it, containing a reply to the objections urged againſt it by Rafe Brooke, York-herald. In 1603 Camden cauſed to be publiſhed at Frankfort, in folio, a collection of our ancient hiſtorians; ſome never before publiſhed, and others rendered more accurate and complete, under the title of "Anglica, Normannica, Hibernica, Cambrica, à Veteribus deſcripta, &c.;" and in 1605 appeared his "Remaines of a greater Work concerning Britain, the Inhabitants thereof, their Languages, Names, Surnames, Empreſſes, wiſe Speeches, Poeſies, and Epitaphes," Lond. 4to. The work was dedicated to his much valued friend and patron, ſir Robert Cotton; and with a view of evading ſuch attacks as had been made upon his "Britannia," he depreciates this collection, calling it "the outcaſt of a greater and more ſerious work, the pitifulneſs and ſillineſs whereof would ſecure it from envy, which only reaches at eminence." Accordingly, he ſubſcribed it only with the final letters of his name. But we have reaſon to believe, that, in reality, he did not think meanly of this collection, dedicated to one of his beſt friends, and a competent judge of its contents; and well received by the public, as it paſſed through ſeveral editions. Camden alſo compoſed many brief eſſays on Britiſh antiquities, chiefly at the requeſt of the Society of Antiquaries, of which he was a member. Thoſe that are ſtill extant may be found in the collections of Thomas Hearne. In 1606 a correſpondence commenced between Camden and the famous preſident De Thou, which continued for 11 years, till the death of the latter, and in the courſe of which the former communicated many uſeful notices concerning the affairs of Great Britain. On the diſcovery of the gunpowder plot, Camden was employed by king James to draw up an account of it in Latin, for the information of foreigners; and this ſervice was performed by him in a ſatisfactory manner. It was publiſhed in 1607, 4to. by the king's printer, in Latin, Greek, and Hebrew: and not long after it was inſerted in the liſt of prohibited books by the inquiſition at Rome. In this year he was confined for ſeveral months in conſequence of an injury received by a fall from his horſe; and he employed this time in preparing for the preſs and publiſhing a final and complete edition in folio of his "Britannia." It was this edition that occaſioned him to be diſtinguiſhed as the "Varro," the "Strabo," and the "Pauſanias" of Britain; and it was from this edition that the Engliſh tranſlation of Dr. Philemon Holland was made in 1611, and others of later date. The "Britannia" remains to this day a ſtandard work; and the tranſlations of it in the ſucceſſive editions of biſhop Gibſon, firſt publiſhed in 1695, and of Richard Gough, eſq. publiſhed in 3 large vols. folio in 1789, have been ſwelled by corrections and additions to books of great bulk and importance. Camden, with a mind diſcharged from conſtant attention to what may be denominated his "Opus majus," began, in 1608, to digeſt the materials which he had been long collecting for a hiſtory of the reign of queen Elizabeth, to which he had been firſt excited by his old patron, the lord-treaſurer Burleigh. Whilſt he was proſecuting this work, a proſpect of new preferment, as one of the profeſſors of hiſtory in a new college of polemics, propoſed by Dr. Sutcliffe to be erected at Chelſea, preſented itſelf; but the inſtitution, though patronized by king James, was never eſtabliſhed. He therefore directed his whole attention to the completion of his hiſtory, the firſt part of which, after having been approved by king James, was printed in 1615, under the title of "Annales Rerum Anglicarum et Hibernicarum regnante Elizabethâ ad Annum Salutis, 1589," Lond. fol. The reputation of the author both at home and abroad was much advanced by this publication; but it did not eſcape animadverſion; and his repreſentation of ſome tranſactions, particularly thoſe relating to Ireland, drew upon him ſome virulent attacks, to which, however, he made no reply. He cloſes his preface, in which he gives an account of his ſources of information, and of his reaſon for entitling his hiſtory "Annals," with this memorable declaration: "Whatever it be, I dedicate and conſecrate it at the altar of truth, to God, to my Country, and to Poſterity." The animadverſions made on the firſt volume diſcouraged the author from proceeding to publiſh the ſecond part during his life; and, therefore, after finiſhing it in 1617, he kept the original by him, which was preſerved in the Cotton library, and ſent an exact copy to his friend Mr. Dupuy, who faithfully executed the order for publiſhing it after his death. This hiſtory, at and after the time of its publication, has undergone ſome ſevere ſtrictures. Some of the moſt candid judges, who have thought it, upon the whole, a valuable hiſtorical compoſition, have been of opinion, that it contains too favourable a repreſentation of the reign of queen Elizabeth. Le Clerc, in his "Bibliotheque Choiſie" (tom. 8. p. 139. 158.), has made ſome obſervations on what Camden has ſaid concerning Buchanan, and Mary queen of Scots, and has ſhewn, that thoſe parts of his work are written under the influence of prejudice or miſinformation. He farther intimates, that Camden was miſled by the good opinion he entertained of king James I. and his zeal for his ſervice; and it appears, that his ſubmiſſive loyalty led him to pay a regard to the judgment of his prince, to which it was not entitled. Dr. Robertſon alſo obſerves (Hiſt. of Scotland, vol. ii. p. 388, &c.), that Camden's repreſentation of ſome important tranſactions relative to queen Mary are very ill founded, and that this part of his hiſtory is leſs accurate than any other. Hume, however (Hiſt. of England, vol. vi. p. 195, 8vo.), ſays, that "Camden's hiſtory of queen Elizabeth may be eſteemed good compoſition both for ſtyle and matter. It is written with ſimplicity of expreſſion very rare in that age, and with a regard to truth. It would not perhaps be too much to affirm, that it is among the beſt hiſtorical productions which have yet been compoſed by any Engliſhman."

After the completion of his hiſtory, Camden paſſed his time in literary leiſure and in the exerciſe of his heraldic office; his ſummers were generally ſpent at Chiſlehurſt in Kent, and his winters at his houſe in Weſtminſter. One of the laſt acts of his life was that of founding a hiſtory-lecture at Oxford; for the ſupport of which he appropriated the valuable manor of Bexley in Kent, which he made over to the univerſity in 1622: and he appointed Mr. Degory Wheare as the firſt profeſſor. For this eſtabliſhment the univerſity, which had been ſlow in conferring favours upon him, when a young man, honoured him, after his death, with ſingular teſtimonies of reſpect. Camden died at Chiſlehurſt in November, 1623, in the 73d year of his age, and was buried with great heraldic pomp in Weſtminſter abbey, near the learned Caſaubon, and over againſt the celebrated Chaucer. Near the place was erected a monument of white marble, with his effigies to the middle, and in his hand a book with "Britannia" inſcribed on the leaves; under which there is an elegant inſcription. As an antiquarian, Camden's character has been long eſtabliſhed; ſo that he may be juſtly reckoned as the father of Britiſh antiquities, and the materials which he collected have ſerved as a baſis for the accumulation of further knowledge on the ſubject. His merits as an hiſtorian have been already ſtated. For the elegancies of literature he is ſaid to have had a taſte, ſo that he wrote Latin verſe with purity and harmony. Biſhop Gibſon, in his life of Camden, has given a conciſe ſketch of his character in the following words: "In his writings he was candid and modeſt, in his converſation eaſy and innocent, and in his whole life even and exemplary." But neither his extenſive learning, nor his high reputation, could defend him from the envy of his enemies while living, or his memory from inſults after his death. Biog. Brit.

Camden, in *Geography*. See Campden.

Camden, or Cambden, a county of North America, in Edenton diſtrict, North Carolina, ſituate in the N.E. corner of the ſtate. It has 4033 inhabitants, including 1038 ſlaves. Its chief town is Joneſborough.

Camden, a diſtrict of the upper county of South Carolina, bounded by Cheraws diſtrict on the N.E., Georgetown diſtrict on the S.E., and the ſtate of North Carolina on the N., and divided into the following counties, *viz.* Clarendon, Richland, Fairfield, Claremont, Lancaſter, Kerſhaw, and Salem. It is 82 miles from N. to S. and 60 from E. to W., and contains 38,265 inhabitants, including 8865 ſlaves. It is watered by the Wateree, or Catabaw river, and its branches: the upper part is variegated with hills, generally fertile and well watered. It produces Indian corn, wheat, rye, barley, tobacco, and cotton. The Catabaw Indians live in the northern part of this diſtrict.

Camden, the chief town of Camden diſtrict, in South Carolina, is ſeated on the E. ſide of Wateree river, 35 miles N.E. of Columbia, 55 S.W. of Cheraw, 120 N. by W. of Charleſtown, and 643 S.W. of Philadelphia. It is a regular town, and contains about 120 houſes, an epiſcopalian church, a court-houſe and gaol. The navigable river on which it is ſituated, enables it to carry on a briſk trade with the back country. N. lat. 34° 20′. W. long. 80° 38′.

Camden, a county in the lower diſtrict of Georgia, at the ſouth-eaſt corner of the ſtate, on St. Mary's river, containing 305 inhabitants, of whom 70 are ſlaves. The chief town is St. Patrick's.

Camden, a ſmall poſt-town on the weſtern ſide of Penobſcot bay, in the diſtrict of Maine, and the ſouth-eaſternmoſt townſhip of Lincoln county, having Thomas-town on the S.W.; 35 miles N.N.E. from Pownalborough, and 228 miles N.E. from Boſton.—Alſo, a village in the county of Kent, and ſtate of Delaware, about four miles S.W. from Dover, and five north-weſterly from Frederica.

CAMEA. See Camæa.

CAMECHIA, in *Ancient Geography*, the name of a town in Albania, mentioned by Ptolemy.

CAMEHUIA. See Camaieu.

CAMEL, in *Geography*. See Alan and Camelford.

Camel, *mount*, lies on the W. coaſt of New Zealand, in the South Pacific Ocean, and is remarkable on account of the land that is contiguous to it being moſtly low and barren; and as it is near the north end, it is ſeen in almoſt every direction, the iſland being, in this part, very narrow. The obſerved latitude is 34° 20′ S.

Camel, in *Mechanics*, a kind of machine uſed in Holland for raiſing or lifting ſhips, and invented by Bakker, a burgomaſter of Amſterdam, in the year 1688, or 1690. It took the denomination from its heavineſs or ſtrength.

Its uſe is to raiſe veſſels, in order to bring them over the Pampus, which is a paſſage between two ſand-banks, oppoſite to the mouth of the river Y, about ſix miles from the city of Amſterdam, where the ſhallowneſs of the water hinders large ſhips from paſſing. On this account, veſſels which are outward-bound, take in before the city only a ſmall part of their cargo; and they receive the reſt when they have paſſed the Pampus. For the ſame reaſons, thoſe which are homeward-bound, muſt, in a great meaſure, unload before they enter it. Many meaſures were adopted to prevent the accumulation of ſand in this paſſage; but they were ineffectual. About the year 1672, they had no other remedy for this evil beſides that of faſtening to the bottoms of ſhips large cheſts filled with water, which was afterwards pumped out, ſo that the ſhips were buoyed up, and rendered ſufficiently light to paſs the ſhallow. By this method, the Dutch carried out, with the utmoſt difficulty, their numerous fleet to ſea in the above-mentioned year. This plan, however, gave riſe, ſoon after, to the invention of the camel, by which the labour was much facilitated. This machine conſiſts of two half-ſhips, built in ſuch a manner that they can be applied, below water, on each ſide of the hull of a large veſſel. On the deck of each part of the camel there are a great many horizontal windlaſſes; from which ropes proceed, through openings, in the one half, and, being carried under the keel of the veſſel, enter ſimilar openings in the other, from which they are conveyed to the windlaſſes on its deck. When they are to be uſed, as much water as may be neceſſary is ſuffered to run into them; all the ropes are caſt looſe; the veſſel is conducted between them; and large beams are placed horizontally through the port holes, with their ends reſting on the camel, on each ſide. When the ropes are made faſt, ſo that the ſhip is ſecured between the two parts of the camel, the water is pumped from it; and it then riſes, and raiſes the ſhip along with it. Each half of the camel is generally 127 feet in length; the breadth, at the one end, is 22 feet, and at the other, 13. The hold is divided into ſeveral compartments, that it may be kept in equipoiſe, while the water is flowing into it. An Eaſt India ſhip, that draws 15 feet of water, can, by the help of this machine, be made to draw only 11; and the heavieſt ſhips of war, of 90 or 100 guns, can be ſo much lightened as to paſs without obſtruction, over all the banks of the Zuyder-zee.

Leopold aſcribes the invention of this machine to Cornelius Meyer, a Dutch engineer, who, towards the end of the 17th century, was invited to Rome by the Apoſtolic chamber, to cleanſe the Tiber, and render it navigable. In a work entitled, "L'Arte di reſtituire à Roma la tralaſciata Navigazione del ſuo Tevere," Rom. 1683, fol. and deſcribing his inventions, he propoſes a method for carrying large ſhips over ſhallows, which bears a conſiderable reſemblance to that in which the camel is employed; for he ſays, that a veſſel muſt be conſtructed in ſuch a manner as to embrace the hull of the ſhip, like a caſe; and that when placed under the ſhip, it will raiſe it up. But though this machine of Meyer is founded on the ſame principles with thoſe of the camel, it is different, as it conſiſts of one piece, and can be placed under a ſhip only in a dock, by the help of a number of ſcrews. It does not appear that Meyer's machine was ever tried or employed. On the other hand, we are aſſured, on the teſtimony of Bakker, the original inventor of the camel, recorded in 1692, and ſtill preſerved, that in the month of June, when the water was at its uſual height, he conveyed, in the ſpace of 24 hours, by the help of his machine, a ſhip of war, 156 feet in length, from Enkuyſen hooft to a place where there was ſufficient depth; and in 1693, he raiſed a ſhip ſix feet by the help of this machine, and conducted her to a place of ſafety. At later periods, the Dutch invention has been employed in other countries. The Ruſſians uſe camels to carry ſhips over the ſhoals that are formed in the Neva; and they have them of various ſizes. Bernouilli ſaw one, each half of which was 217 feet in length, and 36 in breadth. Camels are likewiſe uſed at Venice. Ships of war, however, to which this machine is applied, muſt unavoidably ſuſtain injury; and it is well known, that the ports of a ſhip which had been raiſed by the camel, were ſo much ſtrained, that they could not afterwards be cloſely ſhut. The principle upon which this machine acts, ſo as to anſwer the purpoſe, is that of ſpecific gravity. Muſchenbroek's Introd. ad Phil. Nat. vol. ii p. 520. Beckmann's Hiſt. Invent. vol. iii. p. 337, &c.

Camel, in *Zoology*. See Camelus.

Camel-*bird*, in *Ornithology*. See Camelus.

Camel's-*hay*, in *Botany*. See Andropogon.

CAMELANI, in *Ancient Geography*, a people of Italy in Umbria, who, according to Hardouin, inhabited the town called *Camilianum*.

CAMELEON, in *Zoology*. See Chamæleon.

Cameleon, Chamæleon, in *Aſtronomy*, one of the conſtellations of the ſouthern hemiſphere, near the pole, and inviſible in our latitude. The ſtars in this conſtellation, according to Sharp's Catalogue, are ten.

CAMELFORD, in *Geography*, is a very ancient, but inconſiderable borough-town of Cornwall, England, ſituated in a dreary, bleak, and almoſt deſolate part of the county: like moſt of the Corniſh boroughs, it has ſcarcely any other claim to public notice, than the privilege of returning two members to parliament. Theſe are elected by the mayor, burgeſſes, and freemen, which do not exceed 20 perſons. It began to ſend members in the reign of Edward VI., and this liberty was confirmed by Mary. It was made a borough by a charter from Richard duke of Cornwall, (when he was king of the Romans,) who granted it a market and a fair. Theſe privileges were afterwards confirmed by his brother Henry III. It was incorporated by Charles I. The whole town contains only 100 houſes; and the pariſh-church is at Lanteglos, about one mile diſtant. This neighbourhood has been, according to the ſtatement of many hiſtorians, the theatre of two deſperate battles; one between the Britons and the Saxons, and the other between the famous Britiſh Pen-dragon, Arthur, and his nephew Modred, or Medrawd, who, after an adulterous intercourſe with Arthur's queen Guenora, rebelled againſt his uncle, and ſought to deprive him of his kingdom. The war laſted ſeveral years, and various battles were fought; but the deciſive conflict at length occurred at Camlan, (probably Caben-alan, the crooked river) where, after two days' engagement, with uncommon ſlaughter, Modred was killed, and Arthur himſelf mortally wounded. See Arthur. The ſite of the battle is diſputed by different hiſtorians; though, from ſome local circumſtances, we are inclined to fix it near the village of Camel, which is within ſight of Glaſtonbury abbey, in Somerſetſhire. Camelford is 228 miles weſt from London; and has a market on Friday.

CAMELIDES, in *Ancient Geography*, iſlands of the Mediterranean Sea, on the coaſt of Aſia Minor. Pliny places them on the coaſt of Ionia, in the vicinity of Miletum.

CAMELINA, in *Botany*, (ſive Myagrum. Dod. pempt. 532. Lob. ic. 224. Venten. iii. p. 14. C. ſativa, Crantz. Auſt.) See Myagrum *ſativum*.

Camelina (Myagrum alterum. Lob. ic. 225.) See Eryſimum *Cheiranthoides*.

CAMELIOMAGUS, in *Ancient Geography*, a place of Italy, in the northern part of Liguria, to the weſt of Placentia.

CAMELITA, Bos, in *Zoology*. See Bison.

CAMELLIA, in *Botany*, (named in honour of George Joſeph Kamel, a Jeſuit, whoſe name has been latinized into Camellus. He is the author of Syllabus Stirpium in inſula Luzone Philippinarum, annexed to the third volume of Ray's Hiſtoria Plantarum) Linn. gen. 848. Schreb. 1145. Willd. 1302. Juſſ. 262. Vent. 2.447. Claſs and order, *monadelphia polyandria*. Nat. ord. *Columniferæ*, Linn. *Aurantia*, Juſſ. *Ebenaceæ*, Vent.

Gen. Ch. *Cal.* perianth many-leafed, imbricated: leaves roundiſh, very blunt: the inner ones gradually larger, deciduous. *Cor.* petals five to ſeven, large, inverſely egg-ſhaped, adhering at the baſe. *Stam.* filaments numerous, erect, coaleſcing below into a crown larger than the ſtyle, unconnected above, ſhorter than the corolla; anthers ſimple. *Piſt.* germ roundiſh; ſtyle awl-ſhaped, the length of the filamens; ſtigmas from three to five, acute. *Peric.* top-ſhaped, woody, furrowed, with as many cells as furrows, ſeparated by very ſlender partitions. *Seeds:* nuts one or two in each cell.

Eſſ. Ch. *Calyx* many-leaved, imbricated; inner leaves larger.

Sp. 1. C. *japonica*. Japan roſe. Linn. Sp. 982.

Thunb. Japan. 272. Jacq. ic. rar. 3. Tab. 553. Curtis, Mag. 42. Lam. Illuſt. Pl. 594. (Tſubakki. Kæmp. amæn. Tab. 851, 852. Thea chinenſis flore roſeo, Pet. gaz. Tab. 33. fig. 4.) "Leaves acutely ſerrated, acuminate." A lofty, large, evergreen tree. *Trunk* covered with an aſh-coloured bark; branches round and ſmooth. *Leaves* alternate, egg-ſhaped, acute, ſhining on both ſides, thick and ſtiff, paler green beneath, on ſhort petioles. *Flowers* large, beautiful, thoſe of the plants which have been raiſed in Europe, lively red, but in their native country they exhibit a variety of colours, nearly ſeſſile, generally ſolitary, but ſometimes two or more together; petals thickiſh, uniting at the bottom into a tube full of nectareous juice; ſtamens about fifty. Stigma unequally five-cleft. Its flowers readily become double, in which ſtate they often occur in Chineſe paintings. A native of China and Japan, introduced into England before 1742 by Robert James lord Petre. It was for a long time very ſcarce, and as it bore a high price, was generally treated as a ſtove plant, but Mr. Curtis obſerves, that it appears a very proper plant for the conſervatory, and may hereafter, probably, be treated as a lauriſtina or magnolia. It is propagated either by layers or cuttings. Petiver conſidered it as a ſpecies of tea-tree, to which it is certainly nearly allied. 2. C. *ſaſanqua*, Thunb. jap. 273. Kæmpf. amæn. 853. "Leaves obtuſely ſerrated, emarginate." A tree of a middling ſize. *Stem.* much ſmaller, and more ſlender than that of the preceding ſpecies. *Leaves* thinner and narrower. Flowers many times ſmaller, ſolitary, terminating the branches; calyx of five or ſix leaves; petals from five to ſeven, ſnow-white, deciduous. The leaves dried in the ſhade have a ſweet ſmell, and are mixed with tea to give it a grateful odour: a decoction of them is uſed by the women to waſh their hair with. This ſpecies ſo reſembles the tea-plant, that it is diſtinguiſhed chiefly by the coaleſcing ſtamens, and this, as Thunberg obſerves, is ſcarcely a ſufficient mark of diſtinction, ſince the ſtamens coaleſce only at the baſe, and ſometimes ſeem to be diſtinct. A native of Japan. The Chineſe call this plant "Chawhaw," or flower of tea. It yields a nut, from which is expreſſed an eſculent oil, equal to the beſt which comes from Florence. On this account, it is cultivated in great abundance; and is particularly valuable from the facility of its culture in ſituations fit for little elſe. See ſir George Staunton's Embaſſy to China, vol. ii. p. 467. He has given a drawing of the plant. 3. C. *drupifera*, Lour. Cochin. 141. "Leaves oblong-egg-ſhaped, ſlightly ſcollopped; flowers two or three together, terminating; drupes four-celled." A middle ſized tree with ſpreading branches. *Leaves* acuminate, ſmooth, hard, ſmall, alternate, petioled. *Flowers* white; petals eight, oblong, emarginate: ſtyle quadrifid, the length of the ſtamens. *Drupe* roundiſh, with a grooved, four-celled nut, and roundiſh kernels. The fruit is equal in ſize to the walnut, and is not much unlike it, but is not eſculent. The oil expreſſed from the nuts is uſed by the natives to anoint their hair, and for various medical purpoſes; it has a pleaſant odour, and does not ſoon become rancid. A native of Cochinchina. This plant is taken up by profeſſor Martyn as a camellia, from Loureiro; but Boſc aſſerts, that its botanical characters are far remote from thoſe of this genus, and with his uſual parſimoniouſneſs, gives no further obſervation on this ſubject.

CAMELOBOSCI, in *Ancient Geography*, a people of Aſia, placed by Ptolemy in Carmania, and ſurnamed Soxotæ.

CAMELOPARDALIS, in *Zoology*, a genus in the Pecora order of Mammalia, inſtituted by Gmelin, upon the authority of late writers, for the reception of that curious animal the Giraffe, or Camelopardi. The character of the genus, as laid down by this author, conſiſts in having the horns very ſimple, covered with ſkin, and terminated by a tuft of black hair; the fore teeth in the lower jaw eight in number, broad, thin, and the outer one on each ſide deeply bilobate.

Linnæus deſcribes this creature in the twelfth edition of his Syſtema Naturæ, as a kind of cervus, or deer, under the ſpecific title of Camelo-pardalis; a name by which it was known among the earlier Latin writers, as Strabo and Oppian. Linnæus was not ſingular in conſidering the giraffe as a ſort of cervus; he had the example of Geſner, and other nomenclators before him. Geſner affirms (as he tells us), on the credit of Belon, one of the earlieſt among modern naturaliſts, who has attended particularly to this animal, that the giraffe ſheds his horns like the deer. Buffon complains that no ſuch paſſage as Geſner quotes is to be found in any part of Belon's works; but be this as it may, Linnæus was miſled by this and other accounts of the animal to believe it muſt be of the deer kind. Since the time of Linnæus, naturaliſts are become better acquainted with this animal: it has been diſcovered, that the horns are not deciduous as in the deer, or at leaſt there is every reaſon to think they are not. Theſe horns are of a texture altogether different, not only from thoſe of the animals of that kind, but from all the other known kinds of horned quadrupeds. Anatomiſts obſerve, that theſe horns are only porous bony excreſcences, forming, as it were, a part of the ſkull, a pretty ſtrong proof that they are not deciduous, and cannot be ſhed like the horns of the deer.

From the ſtructure of theſe horns, and the peculiar arrangement of the teeth, it is clear the giraffe is an animal of another genus diſtinct from that of cervus, in which Linnæus places it. Gmelin removes it from the cervus genus in the laſt edition of the Syſtema Naturæ, to that of Camelopardalis, where it ſtands at preſent a ſolitary example of this curious genus.

One of the lateſt and moſt ſatisfactory deſcribers of the giraffe is M. Vaillant. The diſcoveries of this ingenious writer, who, in the progreſs of his travels through Africa, had frequent opportunities of ſeeing them in their native haunts, has thrown new light upon their hiſtory. His obſervations are intereſting, and he has, beſides, rendered an important ſervice to ſcience by enriching one or two of the principal muſeums of Europe with ſpecimens of the animal; from whence the naturaliſt is enabled to form his own opinion of this remarkable animal, unbiaſſed by the reports of inattentive obſervers, or the imperfect details of former travellers. A ſpecimen of the giraffe, in excellent preſervation, ſaid to be ſhot by Vaillant, adorns the muſeum of the late Mr. John Hunter in London, from which we may be capable of conceiving no very inadequate idea of the majeſty of this gigantic animal, when ranging at large in the wilds of its native foreſts: even now one cannot contemplate it without aſtoniſhment. "If height alone conſtituted precedency among quadrupeds (obſerves M. Vaillant), the giraffe would undoubtedly claim the firſt rank, meaſuring when full grown near ſeventeen feet from the top of the head to the fore feet." In this paſſage, however, Vaillant ſpeaks only of the male, the female being ſmaller. Sonnini fully confirms the teſtimony of Vaillant in reſpect to the vaſt height of the giraffe, obſerving, that they ſometimes attain to the height of ſeventeen or eighteen feet. Voſmaer goes further, and declares that ſome very reſpectable inhabitants of the Cape of Good Hope aſſured him they had ſeen and killed giraffes, which, including the horns, were 22 Rhinland feet in height, or nearly twenty-three feet of our meaſure. Impartially conſidering, however, all that has been ſaid on this ſubject by writers in general, we may allow fifteen or ſixteen feet to be the common height of this animal.

Thus it appears, admitting the loweſt calculation, that the giraffe is one of the talleſt animals in nature, and every account we have of it tends to prove that it is as ſociable and inoffenſive in its manners as it is beautiful in appearance. Oppian gives a good deſcription of it. "The camelopardalis (ſays this writer) has ſome reſemblance to the camel: it has a ſpotted ſkin like the panther, and a neck as long as the camel; its head and ears are ſmall: its feet broad, and legs long, but the laſt are very unequal, the fore ones being much longer than thoſe behind, which are ſo ſhort, that when the animal is ſtanding it has ſomewhat the appearance of a dog ſeated on its haunches." He alſo ſpeaks of two prominencies upon the head juſt between the ears, which reſemble two ſmall and ſtraight horns, and of the tail being ſhort and tufted at the end, with black hairs. Heliodorus and Strabo both deſcribe it in nearly the ſame manner. Strabo tells us it was called camelopardalis, although it bears no reſemblance to the panther, as the ſkin is not ſpotted in the ſame way; he likewiſe mentions the docility of its diſpoſition, and that it feeds on vegetables. According to Pliny, it was firſt exhibited by Cæſar the dictator in the Circæan games. It was afterwards more frequently introduced. We are told, that in the time of the emperor Gordian, no leſs than ten were ſhewn at once. Aurelian exhibited it, among other remarkable animals, in his triumph on the conqueſt of Palmyra. Heliodorus ſpeaks of its being brought, among other preſents, by the Ethiopian ambaſſadors to Rome. It is repreſented among other rare animals on the Prænestine pavement, made by the direction of Sylla, and is expreſſed both in its grazing and brouſing attitudes.

Among modern writers, the firſt good deſcription of it we meet with is that of Belon. "I have ſeen," ſays he, "an animal in the caſtle of Cairo, which is commonly called *zurnapa*; the Latins anciently ſtiled it camelo-pardalis, a name compounded of leopard and camel, for it is ſprinkled with ſpots like the firſt, and has a long neck like the latter. It is a beautiful molded animal, as gentle as a lamb, and more ſociable than any other wild beaſt. Its head is almoſt like that of the ſtag, excepting its ſize, and it has two ſmall horns on the head, covered with hair: and thoſe of the male are longer than thoſe of the female." Its neck, he further tells us, is long, ſtraight, and ſlender: its horns round; its legs thin and long, but ſo low behind, that the animal appears as if ſeated. The colour of the hair on the body, he deſcribes, as being white and red. When grazing, it is obliged, he ſays, to ſpread its fore legs very wide, and even then feeds with great difficulty; it is, therefore, he infers, that the giraffe prefers to feed on the leaves of trees rather than to graze in the fields, eſpecially as its neck is exceedingly long, and can reach to a great height.

The deſcription Gellius affords us of the giraffe is ſtill more ſatisfactory. This writer ſaw three camelopards at Cairo, which he thus deſcribes: on their heads are two horns ſix inches long, and in the middle of their forehead a tubercle riſes to the height of about two inches, which appears like a third horn. This animal is ſixteen feet high when it holds up its head. Its neck alone is ſeven feet, and it is twenty-two feet long from the tip of the noſe to the end of the tail; its fore legs are nearly of an equal height, but the thighs before are ſo long in compariſon to thoſe behind, that its back inclines like the roof of a houſe. Its whole body is ſprinkled with large yellow ſpots, which are nearly of a ſquare form. Its feet are cloven like the ox; its upper lip hangs over the under; its tail is ſlender, with hair on it to the very point: it ruminates like the ox, and, like that animal, feeds upon herbage: its mane extends from the top of the head to the back. When it walks, it ſeems as if both ſides were alternately lame, and when it grazes, or drinks, it is obliged to ſpread its fore legs prodigiouſly wide." This laſt paſſage in Gellius's account is contradicted by Vaillant, who aſſerts, it can even drink from a river the ſurface of which is lower than the bank on which it ſtands; and this account of Vaillant, M. Voſmaer (formerly director of the ſtadtholder's collection of natural hiſtory) obſerves, is confirmed by conſidering the ſtructure of the neck, the vertebræ of which are connected with thoſe of the back by a ſtrong ligament.

Antonius Conſtantius, a writer of the fifteenth century, gives an account of a giraffe he ſaw at Faro, which he ſays was ſo gentle that it would eat bread, hay, or fruit, out of the hand of a child, and that when led through the ſtreets, it would take whatever food of this kind was offered to it by the ſpectators. Vaillant confirms this character of the giraffe: he ſays it is of a mild and harmleſs diſpoſition, and when attacked endeavours merely to ſave itſelf by flight, running, according to this writer, with great ſwiftneſs, though in a ſomewhat peculiar and awkward ſtyle, on account of the length of its neck, and breadth of its fore parts, compared with the hind. Vaillant chaſed one of theſe animals on full ſpeed on horſeback, but the animal on turning a ſmall hill, was ſoon out of ſight; the dogs, however, came up with him, and he was obliged to ſtop and defend himſelf, which he endeavoured to do by kicking in a forcible manner, and Vaillant was ſo fortunate as to kill the animal at a ſingle ſhot. Mr. Gordon relates, that a giraffe which he had wounded, ſuffered him to approach it as it lay on the ground, without offering to ſtrike with its horns, or ſhewing any inclination to revenge itſelf: he even ſtroked it over its eyes ſeveral times, when it only cloſed them, without any ſigns of reſentment. Its throat was afterwards cut for the ſake of its ſkin, and when in the pangs of death it ſtruck the ground with its feet, with a force much exceeding that of any other animal; and theſe ſeem to be its principal means of defence.

The male and female giraffe reſemble each other when young, but as the animal advances in age, the ſpots on the male become dark-brown, while thoſe of the female continue of a ferruginous caſt: the latter is, however, ſaid to acquire the duſky ſhades of the male when very old. The tubercle on the forehead, which occurs in both ſexes, is ſmaller on that of the female than the male, and the female has alſo four teats as in the cow. According to Vaillant, the teeth in the giraffe, thirty-two in number, are ſituated thus: ſix grinders on each ſide, both above and below: no front teeth in the upper jaw, but eight in the lower. The horns, both from their ſize and form, ſays M, Voſmaer, ſeem intended merely for ornament: they appear to be excreſcences of the os frontis. Theſe conſiſt of a porous bony ſubſtance, covered externally with ſhort coarſe briſtly hair: they terminate abruptly in a flattiſh or ſlightly convex head, but little wider than the other parts of the horn, and are edged with ſtiff briſtles all round the outline. The hoofs are moderately large and black. All the accounts we have of the giraffe agree in repreſenting its hind quarters as about two feet and a half lower than its withers; but from obſervations made by profeſſor Camper on the complete ſkeleton of the animal formerly in the collection of the prince of Orange, it would appear, that naturaliſts have been miſtaken in this particular. That its fore legs are longer than its hinder legs is true; but the difference is not more than ſeven inches, which, in a height of ſeven feet, is of ſmall conſequence. It may, however, be rendered apparently more conſiderable by the obliquity of the thigh bone with reſpect to the tibia, when compared with that of the humerus to the radius.

The giraffe is chiefly a native of Ethiopia, but there are other parts of Africa, and of Aſia likewiſe, which this intereſting animal inhabits. At the Cape of Good Hope they ſeem to be not very uncommon. They are alſo found as far in the interior of Africa as Senegal, but not, as ſome ſay, in Guinea, or any of the weſtern parts, nor very far to the ſouthward. Theſe animals are ſometimes ſeen in ſmall groupes to the amount of ſix or ſeven together, and when diſturbed, run off with great celerity. They are principally found in foreſts living on herbage of various kinds, but chiefly on the foliage of trees: there is a ſpecies of mimoſa, in particular, which the natives of the Cape call *kannap*, and the Dutch coloniſts, *kameel-doorn*, which the giraffe is remarkably fond of. The Hottentots affirm, that the female goes twelve months with young, and has never more than one foal at a time. The fleſh they deem excellent, and often hunt and kill them for the ſake of food, and for the ſkin of the animal, the latter of which forms a thick and durable kind of leather. In Arabia, the giraffe is known by the name of *ſirapha*, and *zurnaba*, or *zurnapa*.

CAMELOPARDALUS, in *Aſtronomy*, a new conſtellation of the northern hemiſphere, formed by Hevelius, conſiſting of 32 ſtars firſt obſerved by him, ſituate between Cepheus, Caſſiopeia, Perſeus, the two Bears, and Draco, and containing 58 ſtars in the Britiſh Catalogue.

CAMELUS, in *Entomology*, a German ſpecies of SCARABÆUS, deſcribed by Olivier and Fabricius; the thorax of which is four horned; ſhield ſomewhat bicornuted behind; body black. Obſ. The female has a double tranſverſe carinated line on the ſcutel, the poſterior one of which is largeſt.

CAMELUS, in *Ornithology*, *Struthio Camelus*, the black, or common oſtrich. This is ſpecifically diſtinguiſhed from the other ſpecies of STRUTHIO, by having only two toes to each foot. Linn. &c.

The oſtrich is, without doubt, ſays Dr. Latham, the largeſt bird in the creation; it is near eight feet in length, and, when ſtanding upright, is from ſix to eight feet in height. A ſpecimen of this bird, nearly as large, is preſerved in the Leverian muſeum. We have alſo ſeen in the menagery, at Exeter Change, a living oſtrich rather larger. Two oſtriches were ſhewn in London in the year 1750, the male of which, it is recorded in the Gentleman's Magazine, was ten feet in height, and weighed three hundred weight and one quarter. This laſt is the largeſt bird of the kind we ever heard of. The oſtrich has a ſmall head not much unlike that of a gooſe; the bill is alſo ſomewhat ſimilar, but leſs depreſſed, and four inches and a half in length, horn colour, with the tip duſky. The irides are hazel; eye-lids beſet with hairs; the head, and greateſt part of the neck, are bare of feathers, and of a fleſh colour, with a few ſcattered hairs. Lower parts of the neck and body are covered with black feathers, which are ſingularly looſe in their webs, and totally unlike thoſe of any other bird; the quill-feathers, and thoſe of the tail, are ſnowy white, long, and beautifully waved, with the tips of ſome few of them black. On each wing are two ſpurs about an inch in length, and on the breaſt is a callous, bare, and hard ſubſtance, ſerving the bird to reſt on when it firſt bends forward to ſit on the ground: thighs and ſides of the body naked: legs ſtrong, greyiſh brown, and furniſhed with two claws, the outer one of which is very ſhort, and without a claw. The female differs in having thoſe feathers brown, which in the male are black.

This bird inhabits Africa, and thoſe parts of Aſia that lie contiguous to it, but appears to be moſt abundant about the Cape of Good Hope. The egg is as large as a child's head; and capable of containing better than five pints of liquor. The female is ſuppoſed to lay nearly fifty eggs in a ſeaſon; from ſixteen to twenty is the amount of thoſe uſually contained in a ſingle neſt, according to Dr. Sparrman. Theſe the female oſtrich buries in the ſand, where, it is the common opinion, they are hatched by the heat of the ſun, the female taking no further care of them after once depoſiting them in ſafety; but this is contradicted, in a great meaſure, both by Kolben and Sparrman. Kolben tells us the male and female ſit on them by turns, and that he has ſeen them hatching their eggs hundreds of times, and as often driven them off, and taken their eggs to feaſt himſelf and his friends; one of which would prove a meal for three or four perſons; and beſides this, they are ſaid to be very good. Dr. Sparrman thinks, the male and female ſit on the eggs by turns, as in one of his journies, in the month of December, he frightened a male from the neſt, which was made only on the bare ſand, on which the eggs lay ſcattered and looſe, and were eleven in number. Buffon allows, that the oſtrich ſcarcely ever loſes ſight of the eggs, but aſſerts, that it is only in the more northern parts that the female has occaſion to ſit on them, the ſun being alone ſufficient to hatch them in the torrid zone. Kolben ſays, the young ones cannot run when firſt hatched, but are ſupplied with graſs and water by the old ones. The adult birds are endowed with great ſtrength.

Oſtriches feed on vegetables, and beſides which they are frequently obſerved to ſwallow various other ſubſtances. Old nails, and other bits of iron, lead, copper, or glaſs, are alike indiſcriminately taken into the ſtomach of this voracious bird. It is a vulgar notion, however, that the oſtrich can eat ſuch ſubſtances; that they ſwallow them is clear, but it would be the height of abſurdity to imagine they can digeſt them; nor do they always ſwallow them with impunity, as they are liable to many accidents, from their promiſcuous manner of feeding, and the ſwallowing of iron and other ſuch ſubſtances ſometimes proves fatal to them.

The natives of thoſe parts which the oſtrich inhabits moſt commonly take them by hunting. They follow the birds at a diſtance for two or three days, when the birds, fatigued by being perpetually haraſſed, and wanting time to take food, are very eaſily overtaken, and killed with their clubs. Other oſtrich hunters conceal themſelves in the ſkin of one of thoſe birds, and by that means approach near enough to ſurpriſe them. It is alſo uſual to hunt them on horſeback with dogs, and after overtaking them to approach ſo cloſe as to apply the hooked end of a ſtaff round their legs, which throwing them down they may be either taken alive, or knocked on the head immediately.

The capture of theſe birds is an object of conſequence to the Africans. Oſtrich feathers are in requeſt for ornamental purpoſes in all parts of the world, and form an article of commerce between the Africans and European powers. The ſkin of this bird is very thick, and being of a durable nature is a good ſubſtitute for leather. The fleſh is eaten by the Hottentots, and the eggs are in eſteem both with the Africans and European ſettlers. The egg-ſhells anſwer for drinking cups and other utenſils, and are often mounted in gold or ſilver for that purpoſe. They are hard and durable, and, when fine, are not greatly inferior to ivory. In the

Eaſt both the ſhell of this bird, and that of the caſſowary, are adminiſtered as medicine.

CAMELUS, or *Camel*, in *Zoology*, a genus of quadrupeds, which, in the Linnæan ſyſtem of animals, ſtands in the PECORA order of his claſs MAMMALIA. The character of this genus conſiſts in having no horns: the front teeth in the lower jaw ſix, rather thin, and broad: laniarii or canine teeth diſtant, three in the upper jaw, and in the lower two: upper lip cleft or divided.

Zoologiſts diſcriminate ſeveral ſpecies of the camel tribe, independently of thoſe animals which are known in Europe by the appellation of the Arabian camel, or dromedary, and the Bactrian camel. Gmelin ſpeaks of five, making altogether, with the two preceding, ſeven ſpecies, namely, *Camelus dromedarius* of Linnæus, the common, or Arabian camel: *Camelus bactrianus*, Linn. the bactrian camel: *Camelus glama*, the llama, or lama: *Camelus huanacus*, the guanaco, huanaco, or allo-camelus of Geſner: *Camelus araucanus*, the chilihueque, or Peruvian ſheep of ſome authors: *Camelus vicugna*, the vicuna; and *Camelus paco*, the paco, or pacos of Pennant.

The firſt ſpecies, *Camelus dromedarius*, is diſtinguiſhed by having only one bunch, or protuberance, on the back. The general height of this camel, meaſured from the top of the dorſal bunch to the ground, is about ſix feet and a half, but from the top of the head when the animal elevates it not much leſs than nine feet: the head, however, is uſually ſo carried as to be nearly on a level with the bunch, or rather below it, the animal bending the neck extremely in its general poſture: the head is ſmall; the neck very long; the body of a long and meagre ſhape: the legs rather ſlender, and the tail, which is ſlightly tufted at the extremity, reaches to the joints of the hind legs: the feet are very large, and are hoofed in a peculiar manner, being divided above into two lobes, not reaching through the whole length of the foot; and the extremity of each lobe is guarded by a ſmall hoof: the under part of the foot is covered with an extremely ſtrong, tough, and pliable ſkin, which, by yielding in all directions, enables the animal to travel with peculiar eaſe and ſecurity over dry, hot, ſtony, and ſandy regions, which would ſoon parch and deſtroy the hoof. On the legs are ſix calloſities, viz. one on each knee; one on the inſide of each fore leg, on the upper joint, and one on the inſide of each hind leg, at the bottom of the thigh. On the lower part of the breaſt is alſo a large callus or tough tubercle, which is gradually increaſed by the conſtant habit which the animal has of reſting upon it in lying down.

One cannot be deceived as to the native country of the camel, ſays the energetic Buffon, when we conſider the nature and ſtructure of theſe animals; they are the natural inhabitants of the burning deſerts of Arabia, from whence they have been gradually diffuſed over the reſt of Africa and Aſia. It has been tried, but without effect, to multiply camels in Spain; they have alſo in vain been tranſported to America, but they have ſucceeded neither in one climate nor in the other, and they are ſeldom to be met with in the Eaſt Indies beyond Surat and Ormus. It is not abſolutely to be ſaid, that they cannot ſubſiſt and increaſe in the Eaſt Indies, Spain, America, or even in colder countries in Europe, by keeping them during winter in warm ſtables, feeding, and treating them with care; not allowing them to labour, or ſuffering them to walk out but when the weather is fine, they may be kept alive, and we might even hope to ſee them multiply, but their offspring will be neceſſarily ſmall and languid. They loſe, therefore, all their value under the influence of our climates, and inſtead of becoming uſeful, the rearing of them is attended with much fruitleſs expence; while on the contrary, in their native country, they may be ſaid to compoſe all the wealth of their maſters. Camels have conſtituted the riches of Arabia from the earlieſt ages of the world: the modern Arabs eſtimate their wealth by the number of theſe uſeful animals.

The camel is venerated by the Arabs as the gift of Heaven, as a ſacred animal, without whoſe aid they could neither ſubſiſt, trade, nor travel. They alſo eat its fleſh, eſpecially that of the young camel, which they reckon excellent. The hair of theſe animals, which is fine and ſoft, and is renewed every year, ſerves them to make ſtuffs for their cloathing and furniture. Bleſt with their camels, they not only want for nothing, but they fear nothing. In a ſingle day they can traverſe a tract of fifty leagues into the deſert, and thus eſcape the reach of their enemies. All the armies in the world, ſays Buffon, would periſh in the purſuit of a troop of Arabs: figure to yourſelf, for inſtance, obſerves this writer, a country without verdure, and without water, a burning ſun, an air always clear, plains of ſands, and mountains ſtill more parched, over which the eye extends without perceiving a ſingle animated being; a dead earth perpetually toſſed by the winds, preſenting nothing but bones, ſcattered flints, rocks perpendicular or overthrown; a naked deſert where the traveller never breathes under a friendly ſhade, where nothing accompanies him, and where nothing recals to mind the idea of animated nature; an abſolute ſolitude, infinitely more frightful than that of the deepeſt foreſt; for to man trees are, at leaſt, viſible objects; more ſolitary and naked, more loſt in an unbounded void, he every where beholds the extended ſpace ſurrounding him as a tomb: the light of the day more diſmal than the darkneſs of night, ſerves only to give him a clearer idea of his own wretchedneſs and impotence, and to preſent before his eyes the horror of his ſituation, by extending round him the immenſe abyſs which ſeparates him from the habitable parts of the earth; an abyſs which in vain he would attempt to traverſe, for hunger, thirſt, and burning heat haunt him every moment that remains between deſpair and death. The Arab, nevertheleſs, by the aſſiſtance of his camel, has learned to ſurmount, and even to appropriate theſe frightful intervals of nature to himſelf. They ſerve him for an aſylum, they ſecure his repoſe, and maintain his independence. But man never uſes any thing without abuſe. This ſame free, independent, tranquil, and even rich Arab, inſtead of regarding his deſerts as the ramparts of his liberty, pollutes them with his crimes. He traverſes them to carry off gold and ſlaves from the adjacent nations. He employs them for perpetrating his robberies, which unfortunately he enjoys more than his liberty. An Arab, who deſtines himſelf to this kind of piracy, is early accuſtomed to the fatigues of travelling, to want of ſleep, and to endure hunger, thirſt, and heat. With this view he inſtructs, rears, and exerciſes his camels. A few days after their birth, he folds their limbs to remain on the ground, and in this ſituation he loads them with a pretty heavy weight, which is never removed but for the purpoſe of replacing a greater. Inſtead of allowing them to feed at pleaſure, and to drink when they are thirſty, he regulates their repaſts, and makes them gradually travel long journies, diminiſhing at the ſame time their quantity of food. When they acquire ſome ſtrength, he exerciſes them to the courſe; he excites their emulation by the example of horſes, and in time renders them equally ſwift and more robuſt. At length, when he is aſſured of the ſtrength, fleetneſs, and ſobriety of his camels, he loads them with whatever is neceſſary for his and their ſubſiſtence, departs with them, arrives unexpectedly at the confines of the deſert, robs the firſt paſſenger he meets, pillages the ſtraggling habitations,

tions, loads his camels with the booty, and if purſued is obliged to accelerate his retreat. It is on theſe occaſions that he unfolds his own talents and thoſe of his camels: he mounts one of the fleeteſt, and conducting the troop, makes them travel night and day, almoſt without ſtopping either to eat or drink; and in this manner he eaſily paſſes over the ſpace of three hundred leagues in eight days. During all that time of fatigue and travel he never unloads his camels, and only allows them an hour of repoſe, and a ball of paſte each day. They often run in this manner for eight or nine days, without meeting with any water, and when by chance there is a pool at ſome diſtance they ſcent the water, even when half a league from it. Thirſt makes them redouble their pace, and they drink as much at once as ſerves them for the time that is paſt, and for as much to come, for their journey often laſts them ſeveral weeks, and their abſtinence continues till their journey be accompliſhed.

Throughout Turkey, Perſia, Egypt, Arabia, Barbary, and various other contiguous countries, all kinds of merchandize are carried by camels, which of all conveyances is the moſt expeditious, and attended with the leaſt expence. Merchants and other travellers aſſemble, and unite in caravans to avoid the inſults and robberies of the Arabs. Theſe caravans are often numerous, and are always compoſed of more camels than men. Each camel is loaded according to his ſtrength, and when overloaded he refuſes to proceed, remaining in his reſting poſture till his burden is lightened. Large camels generally carry from a thouſand to twelve hundred pounds weight, and the ſmalleſt from ſix to ſeven hundred. In theſe commercial travels their march is not haſtened; as the route is often ſeven or eight hundred leagues, their motions and journies are regulated. They walk only, proceeding at the average rate of ten or twelve leagues each day. Camels that form a part of theſe mercantile caravans, unlike thoſe of the predatory Arabs, it is affirmed, are relieved from their load every night, and allowed to feed at liberty; and in a country where they find abundant paſture they eat in one hour ſufficient to ruminate for a whole night, and to nouriſh them for twenty-four hours. But it is ſeldom they meet with ſuch paſturage; neither is this delicate food neceſſary for them. They even ſeem to prefer wormwood, thiſtles, nettles, furze, and other prickly and thorny vegetables to the ſofteſt herbs, and ſo long as they can find herbage they can eaſily diſpenſe with drink. With qualities of ſuch general utility, in paſſing over the dreary regions of the deſerts theſe valuable animals poſſeſs no ordinary ſhare of ſagacity. They are ſaid, indeed, to be extremely ſenſible of injuſtice and ill-treatment. The Arabs aſſert, that if a perſon ſtrike them without cauſe, he will not find it eaſy to eſcape their vengeance, and that they will retain the remembrance of it till an opportunity offers for gratifying their revenge, having in this point a ſtriking ſimilarity of character with their Arab maſters. It is ſaid, that in their fits of rage they ſometimes take up a man in their teeth, throw him on the ground, and trample him under their feet. Eager of revenge, they retain, however, no longer any rancour, when once they are ſatisfied, and it is even ſufficient if they believe they have gratified their revenge. Accordingly we are told the crafty Arab, when he has by chance excited the rage of a camel, will lay down his garments in ſome place near which the animal muſt paſs, and diſpoſe them in ſuch a manner, that they appear to cover a man ſleeping under them. The camel knows the garments of him by whom he has been treated with injuſtice, ſeizes them with his teeth, ſhakes them violently, and tramples on them in a rage. When his anger is appeaſed by this means, he leaves them, and then the owner of the dreſs may make his appearance without fear, and load and guide, wherever he pleaſes, the animal, who ſubmits with aſtoniſhing docility to the will of a man, whom juſt before it was his wiſh to deſtroy. "I have ſometimes ſeen *hadjins*, or dromedaries, in Upper Egypt, (writes Sonnini,) weary of the impatience of their riders, ſtop ſhort, turn round their long neck to bite them, and utter cries of rage. In theſe circumſtances the rider muſt be careful not to alight, as he would infallibly be torn to pieces; he muſt alſo refrain from ſtriking his beaſt, which would only increaſe his fury. Nothing can be done but to have patience, and appeaſe the animal by patting him with the hand, which frequently requires ſome time, when he will reſume his way and his pace of himſelf. The pace of theſe dromedaries is a very long trot, during which they carry the head high, and the tail ſtretched out ſtiff in a horizontal poſition." The ſaddle, or rather pack-ſaddle, on which the rider ſits, Sonnini deſcribes as being hollowed in the middle, and having at each ſaddle-bow a round piece of wood, placed vertically, which he graſps firmly with each hand to keep himſelf in his ſeat. Some of the ſaddles are more ſimple, not ſo well ſtuffed, and leſs commodious than thoſe of the Arabs, and the handles of the ſaddle-bows are horizontal. Theſe are brought from Sennaar, the capital of Nubia. A long pocket ſuſpended on each ſide to hold proviſions for the rider and his beaſt; a ſkin of water for the rider alone, as the dromedary can travel a week without drinking, with a leather thong in the hand to ſerve as a whip, are the whole of the traveller's equipage: and thus equipped he may croſs the deſerts, travelling fifty, or even fourſcore leagues a day! if this writer can be relied upon. This mode of travelling is fatiguing to exceſs; the loins are broken by the rough and quick ſhaking of the dromedary's pace; the hands are ſoon galled, and become painful; and the burning air which you divide with rapidity impedes the breath, ſo as almoſt to induce ſuffocation. The moſt extraordinary journey of this kind Sonnini ever heard mentioned, was made by a Bedouin, who was pointed out to him at Cairo. He had travelled from that city to Mecca, a diſtance of more than 400 leagues, in five days, a journey for which the caravan of pilgrims employ upwards of thirty days. When the traveller is not in haſte, or accompanies a caravan, the progreſs of which is always ſlow on account of the camels of burden, a kind of covered litter is fixed on one of theſe animals for his accommodation, in which he is tolerably at his eaſe, and may even ſleep if ſo diſpoſed. Women uſually travel in this manner, ſometimes five or ſix together in a litter.

The ancients believed that the dromedary had a natural antipathy to horſes. Xenophon aſſerts this; and Pliny repeats it on the credit of Xenophon. Others have ſaid that they entertain an equal averſion for aſſes and mules. But the truth appears to be preciſely the contrary; for all theſe animals, at leaſt in Egypt and Turkey, live and travel together. Sonnini affirms that there is always an aſs at the head of a file of loaded camels, to whom he officiates as leader, the firſt of the camels being faſtened to the aſs, and following him ſtep by ſtep. Others have agreed in the aſſertion that camels muſt not be beaten too much, or on improper occaſions, which would ſoon make them turn reſtive; but the drivers of the loaded camels have a ſtick with which they beat them, and they who ride upon camels, whip them with a long ſtrap of leather. They are alſo urged on with a clicking of the tongue, much like that employed by us in Europe to inſpirit our horſes It is proper likewiſe to remark, while on this ſubject, that the Bedouins never whiſtle, and that it gives them pain if a traveller, ignorant of their cuſtoms, ſhould whiſtle in their company. Sonnini is perſuaded that even when the Arabs ſing on their march, their object is not to encourage the camels to proceed, but to beguile the tediouſneſs of their journey. Should this opinion be founded in fact, it muſt entirely deſtroy the veracity of Buffon, and ſeveral other writers, who tell us the camels in their march require neither the ſpur nor whip, but when they begin to be tired their courage is ſupported, or rather their fatigue is charmed, by ſinging or by the ſound of ſome inſtrument. Their conductors, we have been told by travellers, relieve each other in ſinging; and when they want to prolong the journey, they give the animals but an hour's reſt; after which, reſuming their ſong, they proceed on their march for ſeveral hours more, and continue to ſing till they arrive at the next reſting place.

The mode of the camel's walk, as deſcribed by Ariſtotle (Hiſt. Anim. lib. ii. cap. i. p. 480. Caſaubon. Lugdun. 1590.) is by raiſing the two legs of the ſame ſide, the one immediately after the other; not moving the legs diagonally, in the manner of moſt other quadrupeds. When he accelerates his pace, it is in the ſame manner as a horſe ambles; though to the rider ten times more jolting than the hardeſt trot of a horſe. M. Niebuhr informs us, in his "Travels through Arabia, &c." that he meaſured the diſtances of places, by counting the ſteps of the camel, and comparing the number with the time in which they were travelled by his watch. In the Philoſophical Tranſactions (vol. lxxxi. part. 2. for 1791) we have an ingenious Memoir "On the rate of travelling, as performed by camels, and its application, as a ſcale, to the purpoſes of geography," by James Rennell, eſq. He obſerves, that the rate of the camel's movement appears to him to be, beyond all others, the leaſt variable, whether we examine it by portions of days or of hours. Accordingly he examined five journals of gentlemen who had croſſed the deſerts between Aleppo, Bagdad, and Baſſorah; viz. that of Mr. Carmichael, in 1751, that of colonel Capper in 1778, that of Mr. Hunter, in 1767, that of Mr. Holford, in 1780, and that of Mr. Irwin, in 1784; and after comparing in various ways the data which theſe journals afford, he concludes, that the hourly rate at which a camel travels, as deduced from Mr. Carmichael's journey, is 2.475 Britiſh miles; from col. Capper's, 2.51; from Mr. Hunter's, 2.585; from Mr. Irwin's, 2.48; and from Mr. Holford's, 2.5: and that the mean of the five experiments gives 2.51 Britiſh miles for the rate at which camels travel in an hour; which may therefore be taken at 2½ miles, Britiſh meaſure. Mr. Rennell further remarks, that it does not appear, from theſe journals, that the load of a camel has any influence on its ſpeed, when it is ſuffered to go at its own rate, as it always is in caravans: the only way in which the load affects the camel's travelling is, that the animal will not travel for ſo long a time when fully laden, as it will when light. For the benefit of thoſe, who, in the interior part of Africa, may not be provided with watches, Mr. Rennell, by comparing the number of days in which each of the five journies, as well as one made by Teixera, acroſs the Chaldæan deſert, were performed, with the whole number of hours which elapſed during their journies, has deduced the following circumſtances; viz. that the heavily loaded caravans, which were accompanied by Mr. Carmichael, Mr. Holford, and Teixera, travelled, on a medium, in each day, for $7^{h}\,10'$, $7^{h}\,40'$, and $7^{h}\,30'$, reſpectively; and that the light caravans of Mr. Irwin, Mr. Capper, and Mr. Hunter travelled, in each day, on a medium, for $9^{h}\,12'$, $8^{h}\,38'$, and $8^{h}\,45'$, reſpectively:—the mean of the three former is $7^{h}\,27'$, and of the latter $8^{h}\,52'$; conſequently, reckoning the rate of travelling of camels, in caravans, to be 2½ miles in an hour, the diſtance travelled by the heavy caravans, in a mean day, will be 18.625 Britiſh miles, and by the light caravans 22⅙; ſo that hence, any traveller, who is in poſſeſſion of a pocket compaſs, to point out the direction in which he travels, and can tell what that was, and the number of days employed by the caravan in going from one place to another, may contribute, very conſiderably, to the improvement of the eaſtern geography. See CARAVAN.

The facility with which the camels abſtain from drink in their journies over the burning deſerts is more remarkable than their abſtinence from food; and it is ſo extraordinary, that, according to Leo Africanus, they are capable of remaining without drink for 15 days without prejudice to their health; but after long abſtinence, it is ſaid that they are apt, on their firſt meeting with water, to drink ſo greedily that it proves ſuddenly fatal to many of them. This facility does not proceed from habit alone, but is rather, as Buffon obſerves, the effect of their ſtructure. Independently of the four ſtomachs, which are common to ruminating animals, the camel is poſſeſſed of a bag which ſerves him as a reſervoir to retain water. This fifth ſtomach is peculiar to the camel: it is ſo large as to contain a great quantity of water, where it remains without corrupting, or intermixing with other aliments. When the animal is oppreſſed by thirſt, or has occaſion for water to macerate his dry food in ruminating, he cauſes part of the water to aſcend into his ſtomach, or even as high as the throat, by the mere contraction of certain muſcles. It is by virtue of this conformation that the camel is enabled to paſs ſeveral days without drinking, and to take at any one time a prodigious quantity of water, which remains in the reſervoir pure and limpid, becauſe neither the liquors of the body nor the juices of digeſtion can mix with it. There can be no doubt that the water preſerved by the camel in this receptacle remains perfectly pure, all writers agreeing in this particular; it is no very uncommon circumſtance in paſſing through the deſerts for travellers to kill a camel in order to obtain a ſupply of water from this receptacle when they are deſtitute of this neceſſary article, and cannot procure it in any other manner. The loſs of a camel, on ſuch an occaſion, is of the leſs conſideration, as the fleſh affords the traveller and Arabs a rich repaſt, independent of the advantage of being ſupplied with water; inſtances of this occur in Bruce's travels to diſcover the ſource of the Nile, and various others

That water, in caſes of emergency, is taken from the ſtomach of the camel, is a fact neither doubted in Syria, nor thought ſtrange. In proof of this fact, it is hardly neceſſary to allege the teſtimony of an Arab hiſtorian (Beidawi) who, in his account of the prophet's expedition to Tabuc againſt the Greeks, relates, among other diſtreſſes of the army, that they were reduced to the neceſſity of killing their camels for the ſake of the water contained in their ſtomachs. Sale's Koran, p. 164. Gibbon's Decl. of the Rom. Emp. vol. v. p. 245. However, Mr. John Hunter, who diſſected a camel, ſaw no reaſon for aſſigning more than four ſtomachs to this animal; though he could conceive that water might be found in the paunch little impregnated by the dry provender of the deſert, and readily ſeparating or draining from it. Mr. Home alſo, who aſſiſted at the diſſection, and who prepared the different ſtomachs in a dry ſtate for the purpoſe of ſhewing their internal ſtructure, and communication with one another, inferred, from this preparation, that the number of ſtomachs is four, as in other ruminating animals; ſo that it cannot be ſaid that there is a diſtinct reſervoir for water: but the ſecond ſtomach has a very peculiar ſtructure, being made up of numerous cells, ſeveral inches deep, with their mouths uppermoſt, and orifices apparently capable of muſcular contraction. When the animal drinks, ſays Mr. Home, it probably has a power of directing the water into theſe cells, inſtead of letting it paſs into the firſt ſtomach, and when theſe are filled, the reſt of the water will go into the firſt ſtomach. In this manner a quantity of water may be kept ſeparate from the food, ſerving occaſionally to moiſten it in the paſſage to the fourth or true ſtomach. The teſtimony of travellers to water being found in the ſtomach, and Daubenton, upon diſſection, meeting with it in the ſecond ſtomach, when compared with the ſtructure of the parts, ſeem to confirm the above conjecture. See Ruſſell's Nat. Hiſt. of Aleppo, vol. ii. p. 426.

If we reflect on the diſſimilarity of this animal to other quadrupeds, Buffon conceives that we cannot doubt but his nature has been conſiderably changed by conſtraint, ſlavery, and perpetual labour. Of all animals, ſays he, the camel is the moſt ancient, the completeſt and moſt laborious ſlave. He is the moſt ancient ſlave, becauſe he inhabits thoſe climates where men were firſt poliſhed. He is the moſt complete ſlave, becauſe in the other ſpecies of domeſtic animals, as the horſe, the dog, the ox, the ſheep, the hog, &c. we ſtill find individuals in a ſtate of nature, and which have not ſubmitted to man. But the whole ſpecies of the camel is enſlaved, for none of them exiſt in their primitive ſtate of liberty and independence. Laſtly, he is the moſt laborious ſlave, becauſe he has never been nouriſhed for pomp like moſt horſes, nor for amuſement like moſt dogs, nor for the uſe of the table like the ox, the hog, and the ſheep; becauſe he has always been made a beaſt of burden, whom men have never taken the trouble of harneſſing or yoking in machines, but have regarded the body of the animal as a living carriage, which they may load or overload even during ſleep, for when preſſed, the load is ſometimes not taken off, but the animal lies down under it with his legs folded, and his body reſting on his ſtomach. Buffon expatiates in this paſſage with conſiderable animation on the ſeverity of the ſervitude to which this uſeful animal is condemned, but the degraded picture he has drawn, it muſt be allowed, admits of ſome alleviation. It is not in all countries it inhabits that the camel is dealt thus rigorouſly with; there are many parts in which he is held in greater favour, and treated with more indulgence than this lively writer intimates. That the camel is kept for pomp as well as utility in various parts of Aſia and Africa, is certain. Many authors ſpeak to this effect. Mr. Bruce frequently ſaw them ſaddled and harneſſed in Africa. Sonnini ſpeaks of them as highly uſeful for the ſaddle. In the eaſt they are oftentimes richly capariſoned for the ſervice of the great. In China, a particular breed of them is trained like our race-horſes for the courſe, and for the performance of journies that require expedition. Camels are alſo inſtructed ſometimes for warlike purpoſes. Mr. Bruce deſcribes the arrival of the caravan from Syene eſcorted by 400 Ababdé, or fighting men, all upon their camels, each armed with ſhort javelins. The manner of their riding he thought more whimſical than calculated to inſpire terror; there were two ſmall ſaddles on each camel, one ſuſpended on each ſide of the animal, ſo that the two ababdé on each camel ſat back to back, a mode which in their practice of fighting he allows may be convenient enough, but had they ventured to contend with the European travellers every ball might have killed two inſtead of one. The camels, however trained by the Egyptians for war and for the ſaddle, were found of conſiderable ſervice in the French armies for the uſe of their diſmounted cavalry, when they lately invaded Egypt. So far, indeed, from the camel being always treated with the rigour Buffon deſcribes, and never being harneſſed or yoked in machines, as he affirms, the teſtimony of every traveller contradicts it. We know that in Tartary the camel is regarded with as much, if not more attention than the horſe. Opulent Tartars, according to Pallas, take a pride in conveying their families from place to place, or in travelling to town in covered waggons drawn by camels; the yoke is placed between their neck and the firſt dorſal bunch (for it is a variety of the Bactrian camel they poſſeſs), and is of a peculiar conſtruction adapted for the purpoſe. Theſe are ſeldom uſed as beaſts of burthen, but are often yoked to the large four-wheeled waggons or *Madſhari*, eſpecially on bad roads and during winter. In armies Pallas conceives they would be ſerviceable both as beaſts of burthen, and in putting to flight any cavalry, the horſes of which are unaccuſtomed to the ſight of theſe curious animals. And indeed the Ruſſians begin to be aware of the value of the camel for the purpoſes of war. In the year 1796 no leſs than a thouſand camels were bought up in Crim Tartary for the uſe of the army in Perſia. In Ruſſia the price of a full grown camel is generally from 100 to 150 roubles, or from 22l. 10s. to 33l. 15s. ſterling. The Egyptians keep large numbers of camels, which are bred and ſold by them to the Arabs. They fetch a pretty high price. At Cairo, according to Sonnini, they are worth 4 or 500 livres each, which is about the loweſt average price they bear in Ruſſia. But in Upper Egypt they are not ſo dear; their price varying from 2 to 300 livres. They are equally numerous in Barbary, but they become more ſcarce towards the weſtern coaſts of Africa. Among other hardſhips endured by the camel, Buffon complains, that it is never nouriſhed for the table like the ox, the hog, or the ſheep; another aſſertion by no means well founded: when by miſchance they have met with any accident that is likely to incapacitate them for the burthen, they are commonly fattened and killed for this purpoſe. We frequently hear of the lame camels being butchered for uſe. Mr. Bruce and his party were frequently regaled with a comfortable meal of camel's fleſh ſtewed, and he ſpeaks of it as an ordinary circumſtance on any occaſion of feaſting or rejoicing in Africa to kill a young camel, and ſerve it up to table. The Jews diſſeminated over the eaſtern, or African parts of the world, do not eat the fleſh of the camel, becauſe they are expreſsly forbidden by the Moſaic laws (Levit. chap. xi. ver. 4.), but the Arabs, and the other inhabitants of Egypt, &c. with the exception of the Chriſtians, conſider it as a dainty and wholeſome food. A curious circumſtance is mentioned by Sonnini reſpecting this: in thoſe cities, he tells us, where the fanaticiſm of the Mahometans is at the higheſt pitch, as in Cairo and Alexandria, it would be deemed a profanation to ſell the fleſh of the camel to the Franks, who, however, on their part, are by no means deſirous of it, for, though it has no diſagreeable flavour, it is hard and dry. In Barbary camels' tongues are ſalted and ſmoked for exportation to Italy, and other countries, and theſe form a very good diſh.

Beſides the highly beneficial properties of the camel for the ſaddle, as a beaſt of burthen, for the yoke, and as wholeſome food, the camel poſſeſſes others not leſs valuable. Its hair is an important article of commerce, and ſerves likewiſe for the fabrication of the tents and carpets of the Arabs, and for wearing apparel: rich ſhawls are made of the hair of camels that are in much requeſt. The Tartar women manufacture a narrow ſort of cloth of it which is uſed of its natural colour: a broad cloth is, or at leaſt was formerly produced from the ſame material at the manufactory of *Novoroſſeiſk*, or *Ekaterinoſlavl* in the Crimea. Curious cloths are alſo formed of it in Perſia at this time. It is known by the French in trade, under the improper name of "Laine de Chevron." The moſt eſteemed is brought from Perſia by the caravans of Erivan, Tiflis, Erzerum, and Tocat. There is ſome of three qualities; the black, the red, and the gray. The black is the deareſt; and the gray is worth only half the price of the red. Some of it is brought annually to Marſeilles by way of Aleppo, Smyrna, and Conſtantinople. This laſt city exports from 80 to 100 bales, weighing about 300 pounds the bale. Smyrna and Aleppo ſend a much more conſiderable quantity. This kind of wool is employed in the manufacture of hats; and is purchaſed by all the European nations that trade to the Levant. The French, however, conſume the greateſt quantity of it. The Engliſh employ but a ſmall quantity of the black, which they procure at Smyrna. Olivier's Travels in the Ottoman Empire, p. 223. The dung of the camel is uſed as fuel, and in Arabia the milk of the females affords one of the ſimple and ſalutary aliments of the Bedouins.

The camel that carries Mahomet's ſtandard, which the caravan of pilgrims offer yearly on the tomb of their prophet, is exempted the reſt of its life from all ſervices. It is even pretended that this happy beaſt will riſe again at the general reſurrection, and enjoy the pleaſures of paradiſe.

The general aſpect of the camel, at firſt ſight, is apt to impreſs the mind with the idea of deformity; and in particular the dorſal bunch has the appearance of ſome accidental protuberance rather than a truly natural conformation. This idea ſeems to have operated ſo powerfully on the mind of Buffon, that he has not ſcrupled to advance an opinion that this part, as well as the pectoral bunch, was originally produced from ill uſage in conſtantly loading the animal with heavy burthens, and that having once ariſen, it has been tranſmitted by deſcent, and continues to form a permanent character. In confirmation of this theory, he inſiſts, that although theſe calloſities are to be met with in every camel, yet they plainly prove that they are not natural, but are produced by exceſſive conſtraint and pain, from being often found filled with pus. "The breaſt and legs, therefore, (continues this writer), are deformed by theſe calloſities; the back is alſo disfigured with a ſingle, or double hunch; and both theſe hunches and calloſities are perpetuated by generation. As it is evident the firſt deformity proceeds from the cuſtom of forcing them when quite young to lie on their ſtomachs, with their legs bent under them, and in that cramped poſture to bear not only the weight of their own body, but alſo the burthens which are put upon them, it muſt be preſumed that the hunch, or hunches, owe their origin to the unequal compreſſion of heavy burthens which are put upon them, and have raiſed the fleſh, and puffed up the fat and ſkin; for theſe hunches are not bony, but compoſed of a fleſhy ſubſtance, partly of the ſame conſiſtency as the udder of a cow. Thus the calloſities and the hunches ſhould be equally regarded as deformities produced by the continuance of labour and conſtraint of body; and though at firſt accidental and individual, are now become general and permanent in the whole ſpecies. It may alſo be preſumed that the bag which contains the water, and which is only an appendage to the paunch, has been produced by a forced extenſion of this viſcus. The animal after enduring thirſt for a long time, taking at one time as much and perhaps more water than the ſtomach could contain, this membrane would become extended and dilated, as has been obſerved in the ſtomach of ſheep, which extends and acquires a capacity in proportion to the quantity of its aliment. The ſtomach is very ſmall in ſheep that are fed with grain, while in thoſe that are fed on herbage it becomes very large." "Theſe conjectures, (Buffon allows) however, would be fully confirmed or deſtroyed, if any of theſe animals could be found wild to compare with the domeſtic; but theſe animals do not exiſt any where in a natural ſtate, or if they do, no one has yet remarked or deſcribed them; and we muſt therefore ſuppoſe that all which is good and fair about them they owe to nature, and that which is defective and deformed is occaſioned by the labour and ſlavery impoſed on them by the dominion of man." The Bactrian camel, or that with two dorſal bunches, is, however, ſaid to be found wild in the deſert parts of Aſia between India and China, and to be larger than the domeſticated animal, and ſhould this be true, the reaſoning of Buffon falls to the ground. What he has advanced may apply in ſome meaſure to the calloſities on the legs, or to that on the breaſt, all which may ariſe from the cauſe he aſſigns; but with reſpect to the accidental production of the dorſal protuberance, his conjecture appears improbable. We have every reaſon to believe that thoſe bunches cannot be formed from the ſuperabundance of nouriſhment, although they may be inflated, and appear more plump from this cauſe: thoſe bunches in long journies where they are ſtinted for food, it is ſaid, diminiſh gradually, and are reduced ſo flat at laſt, that their places are only diſcovered by the length of the hair, which is always longer on theſe parts than on the reſt of the back; but the other parts of the body waſte in a ſimilar manner at the ſame time, and when the animals are fattened again, as they acquire fleſh in other parts, thoſe dorſal bunches reſume their former bulk. So that upon the whole we are perſuaded thoſe dorſal bunches are natural both for this reaſon, and becauſe throughout all the varieties of the two moſt frequent kinds of camel, the Arabian and Bactrian, one race is conſtantly diſtinguiſhed by having no more than a ſingle dorſal bunch, and the other two. Were theſe bunches the effect of accident or of heavy preſſure only, we ſhould certainly find nature leſs conſtant in this particular.

The ancients have ſaid that theſe animals are in a condition for generation at the age of three years; but this is doubtful, ſince they have not at that age attained to above half their growth. The young camel ſucks its mother 12 months; and when deſigned for labour, to make him ſtrong and robuſt, they leave him to ſuck or graze for a longer time; nor do they attempt to load him or put him to work till he has attained the age of four years. The camel commonly lives 40 or 50 years, but ſeldom longer. The labouring camels are generally geldings, as they leave but one male for eight or ten females; they are without doubt weaker than the males, but they are more tractable, and ready for employ at all times. The males, on the contrary, are not only ungovernable but even furious in the rutting time, which continues for the ſpace of 40 days, and returns every ſpring. At this ſeaſon they emit frequently a kind of hoarſe lowing, with a ſtrong rattling in the throat; they continually foam, and one or two red veſicles, as large as a hog's bladder, and of a diſguſting appearance, hang out of their mouths. They are extremely dangerous at ſuch times; it is ſaid that in their fits of rage, they will ſometimes take up a man in their teeth, throw him to the ground, and trample him to death. The female goes 12 months with young, and like other large quadrupeds produces but one at a birth.

It is remarkable that the dromedary of which we have been ſpeaking is the only ſort of camel found in Egypt. If we follow the diſtinction made by Ariſtotle and Pliny, and repeated by Buffon, (ſays Sonnini), between two ſpecies of animals which nature has diſcriminated by a conſtant, and very ſtriking mark, there are no camels in Egypt. In fact, there is no animal of that kind which has two bunches on the back (*Camelus Bactrianus, Linn.*); all that are found in this country have only one, and are conſequently of the dromedary ſpecies. The Arabic word *djemmel*, which anſwers to camel, is likewiſe the only one uſed by the inhabitants of Egypt for that breed, which is the moſt common, moſt uſeful, of greateſt ſize and ſtrength, heavy of foot, and employed for carrying burthens. On the contrary, that which is leſs tall and bulky, and poſſeſſed of great agility, is called dromedary by the Europeans, and *hadjin* by the Arabs, becauſe it is the animal which the *hadjis* or pilgrims uſually ride. Sonnini likewiſe mentions a ſmaller kind of camel in Egypt which is much leſs known, and of which he only ſaw a few among the Bedouins; they are of a ſhorter make than the common ſort; their body is more round; they are not ſo tall; their hair is longer and thicker, and they are of a fallow colour inclining to brown.

In concluſion of this article we may adopt the words of Buffon: by uniting under one point of view all the qualities of this animal, and all the advantages which are gained by him, he muſt be acknowledged to be the moſt uſeful of all creatures under ſubordination to man. Gold and ſilk are not the true riches of the Eaſt; the camel is the treaſure of Aſia. He is of greater value than the elephant, as he does as much labour, and does not conſume a twentieth part of the food. Beſides, the whole ſpecies is ſubject to man, who propagates it and multiplies it as much as he pleaſes. But he has no ſuch dominion over the elephant, which he cannot multiply, and the individuals of which he cannot conquer without more trouble and difficulty. The camel is not only of greater value than the elephant, but is perhaps equal in utility to the horſe, the aſs, and the ox, when their powers are united. He carries as much as two mules, though he eats leſs, and feeds on herbs as coarſe as thoſe the aſs will eat. The female furniſhes milk longer than the cow; the fleſh of young camels is as good and as wholeſome as veal: the hair is finer, and in more requeſt than the fineſt wool. Even their excrements are uſeful, for ſal ammoniac is made of their urine; their dung, when dried and powdered, ſerves them for litter, as well as for the horſes with whom they frequently travel in countries where neither hay nor ſtraw is to be obtained. Their dung (chopped and intermixed with ſtraw) forms an excellent fuel, burns freely, gives a clear and nearly as hot a flame as that of dried wood, and which is of great uſe in the deſerts, where not a tree is to be ſeen, and where, for the want of combuſtible materials, fire is as ſcarce as water.

There are ſeveral varieties of this kind of camel differing in ſize, ſtrength, colour, and other ſlight particulars, as in our different breeds of horſes, and other domeſticated animals; and there are likewiſe hybrid varieties produced between this and the following ſpecies. It ſhould be further ſtated, to prevent confuſion, that the dromedarius of Geſner is not the ſame animal as Jonſton deſcribes in his hiſtory of quadrupeds by that name; the latter means the Bactrian, or two bunched camel. Knorr follows this writer, calling the Bactrian camel Dromedar, Trampelthier oder Dromedar; but this, as already ſhewn, is not the true dromedary. Forſkall diſtinguiſhes the Arabian camel, our preſent ſpecies, and dromedary of modern authors, by the title of Camelus vulgaris: it is Camelus of Jonſton; and Camelus Dromas of Geſner.

On medals, the camel is the ſymbol of Arabia, when found on the coins of any other nation. Thus, on a medal of the gens Plautia, we find a woman's head with a mural crown, *A. Plautius Æd. Cur. S. C.* and on the reverſe, *Judæus;* and in the exergue, *Bacchius*; the device, a man on his knees holding with his right hand a camel by the bridle, and with the left, a branch of palm. It alſo denotes alliance with Arabia.

CAMELUS *Bactrianus*, the Bactrian camel, and Le Chameau of Buffon, a ſpecies known from the preceding by having two dorſal bunches. Pallas calls it the Tauridan camel.

This kind attains in the peninſula of the Crimea to a larger ſize than among the Kalmuc Tartars. Pallas obſerved them in that country of a white and yellowiſh white colour, and ſometimes of a blackiſh colour; but theſe laſt were leſs frequent than the others. If we may credit Sonnini, this ſort is not to be found in Egypt, where they alone rear, and cultivate that kind which we denominate the Arabian camel. It is the Tauridan camel that generally prevails in Ruſſia and Siberia; the mild winter of the Crimea in particular is very favourable to the habits and propagation of this animal. This is the camel which authors mention as ſtill exiſting in a ſtate of nature, in the deſerts of the temperate parts of Aſia, more eſpecially in thoſe between China and India, and which is reported to be larger than the domeſticated race. The Arabian camels are beyond compariſon more numerous, and univerſal than this kind, which is chiefly confined to ſome parts of Aſia; a moiſter ſoil and more temperate climate being more congenial to its habits than the hot and parched regions of the African deſerts, which the Arabian camel inhabits. It has acquired the name of Turkiſh camel from being found in Turkeſtan, and ſome other parts of the Levant. From Pallas it may be ſeen that the Tauridan camel is more common in various diſtricts of the Ruſſian territory than is generally conceived. They rarely employ this creature like the Arabian camel as a beaſt of burthen, but train it for the ſaddle, and for drawing travelling waggons, and ſimilar machines in the manner Europeans train horſes. This animal thrives beſt in the milder parts of Tartary; but it bears even the ſeverity of a Siberian climate, being found in the vicinity of the Baikal lake, where we are told the Mongols and Burats keep great numbers of them. Here they are ſaid to live during winter on willows and other trees, a diet affording little nouriſhment, and in conſequence of which they become lean and meagre towards the latter part of the winter ſeaſon. In April they loſe their hair, and go naked all May amidſt the froſts of that ſevere climate. They thrive beſt in dry grounds, and among the ſalt marſhes. This animal is cultivated in China, where they have a breed of peculiar ſwiftneſs, that bears the expreſſive name of *Fong Kyo Fo*, or camels with feet of wind. See the article BACTRIANUS.

CAMELUS *Glama*, the LAMA, is the third ſpecies in the Linnæan genus *camelus*. The modern French naturaliſts conſtitute a diſtinct genus of the lama, camelus glama *Linn.* the huanaco, camelus huanacus, and camelus lama of Erxleben; pernichcatl of Ferdnandez; and guanaco of Ulloa. With thoſe naturaliſts the lama forms the ſecond ſection of ruminating animals, and is characteriſed as having from four to ſix inciſive teeth in the lower jaw; the fiſſure in the upper lip; the length of the neck; and abſence of the dorſal bunches. This diviſion of the *camelus* ſo far as relates to the ſpecies glama is not objectionable: the abſence of the dorſal bunches would form a good generical diſtinction; but in adopting it, we ought certainly to exclude the ſpecies *huanacus*, or guanaco, that animal being remarkable for the gibboſity of the back. It may, however, be better to retain the lama tribe with that of the camelus till we are better acquainted with thoſe animals; for it is not to be diſguiſed that an inexplicable confuſion prevails among writers with regard to ſome of them. They are all natives of South America, and are at beſt but imperfectly known to the naturaliſts of Europe. Even in following the beſt authorities, when treating of them, we are not entirely without ſuſpicion that no great dependence ought to be placed on the characters hitherto aſſigned to ſome of thoſe ſpecies. It is not improbable that ſome of thoſe which are at preſent conſidered as diſtinct ſpecies may hereafter prove to be only varieties of the reſt.

The *Lama* is diſtinguiſhed by having a bunch on the breaſt, and the back ſmooth, *Linn.* This animal deſcribed by ſeveral old naturaliſts under the name of *Ovis Peruviana*, or Peruvian ſheep, is found in moſt parts of South America, but is moſt plentiful in Peru, where it inhabits, in a wild ſtate, the higheſt and coldeſt parts of the mountains, feeding in numerous herds, and flying with great rapidity on the ſight of mankind. The general ſize of the glama is nearly that of a ſtag, meaſuring four feet and a half in height to the top of the ſhoulders, and about ſix feet in length from the noſe to the tail. The neck is of great length: the head ſmall: the back ſlightly elevated; and the whole animal bears ſome reſemblance to a camel, on a ſmall ſcale. Its general colour is a light ferruginous brown, paler or whitiſh on the under parts, and ſometimes it is ſaid to be varied or patched with darker and lighter ſhades on different parts, and to have a black ſtripe down the back to the beginning of the tail. The hair on the wild animal is long and ſhaggy. On the breaſt is a protuberance, from which is obſerved to exude a yellowiſh kind of oily ſecretion. The voice of the glama reſembles the ſhrill neighing of a horſe. When angry or attacked, it ſtrikes with its feet, endeavours to bite, and at the ſame time ejaculates from its mouth a quantity of ſaliva, which is commonly aſſerted to be of a cauſtic or acrimonious nature, and to excite a ſlight inflammation of the ſkin, but Molina thinks this obſervation deſtitute of truth.

Buffon is perſuaded that the lama, or glama of the Peruvians is the ſame animal as thoſe people call guanaco, or huanaco, the former being altered from its primitive appearance by domeſtication. Molina is entirely of a different opinion, and we have recently had an opportunity of aſcertaining that the Peruvians do themſelves conſider theſe two animals diſtinct, and are well acquainted with both kinds in a wild ſtate, as well as that of domeſtication. It is ſingular, as Buffon remarks, that although the lama, and two or three other analogous animals are bred in Peru and Mexico, as the horſes are in Europe, or the camels in Arabia, we ſcarcely know any thing concerning them; and notwithſtanding the Spaniards have had poſſeſſion of thoſe vaſt countries for above two centuries, not one of their authors has given us an accurate hiſtory, nor any exact deſcription of them. It is affirmed that they cannot be tranſported into Europe, nor even brought from their heights but at the riſk of their lives in a ſhort time. But this is not entirely true: it is certain that after the conqueſt of Peru, ſome of them were tranſported into Europe. The animal ſpoken of by Geſner under the name of allocamellus, and of which a figure is given in his work, is of the lama family, (guanaco) and was brought alive from Peru to Holland in 1558. In 1777 there was a living lama in the veterinary ſchool of Alfort, the ſame no doubt from which Buffon took his deſcription of this animal. It was remarkable for the mildneſs of its manners and diſpoſition. When ranging at large it ſeldom walked, but proceeded in a ſort of trot or gallop. This animal ſubſiſted on herbage, and has been known to neglect drinking for the ſpace of ſix months together, ſo abundant was the ſaliva with which the mouth was conſtantly moiſtened.

Peru, according to Gregoire de Bolivar, is the native country of the lamas: they have been conveyed into other provinces, but more for the ſake of curioſity than utility: In Peru, from Potoſi to Coracas, theſe animals are in the greateſt numbers: they conſtitute the chief riches of the Indians, and add not a little to the wealth of the Spaniards. Their fleſh is excellent food, having the flavour of mutton. Their wool may be ſpun into beautiful cloathing; and they are capable of carrying heavy loads in the moſt rugged and dangerous ways. The ſtrongeſt of them will travel with from one hundred and fifty, to two hundred and fifty pounds weight on their backs: their pace is ſlow, and their journey is ſeldom above fifteen miles a day; but though ſlow in their progreſs, they are ſure-footed, eaſily deſcending precipices, and travelling ſafely amongſt the moſt craggy rocks, where men can ſcarcely accompany them. They commonly travel for about five days together, and are then obliged to reſt for two or three days before they reſume their journey. They are conſtantly employed in the mine territory for conveying the Peruvian ores over the rugged hills and narroweſt paſſes of the Andes. Bolivar affirms, that in his time, above three hundred thouſand of theſe animals were kept in conſtant employment by theſe means. A Peruvian drawing lately brought to England, in which an Indian cavalcade is repreſented, exhibits two figures of theſe animals laden with bars of ſilver, according to the coſtume of that country: each lama bears two of theſe bars which are ſuſpended in a ſort of ſaddle, one on each ſide of the animal.

The growth of the lama is very quick, and its life is but of ſhort duration. At the age of three years it couples, and remains ſtrong and vigorous till twelve, after which it begins to decline, and becomes entirely uſeleſs at the age of fifteen. In their nature they appear modelled after that of their Indian maſters; they are gentle and phlegmatic, performing every thing with the greateſt leiſure and caution. When they ſtop on their journey to reſt, they bend their knees very deliberately in order to lower their body without diſturbing their load, and when they riſe again at the command of their driver's whiſtle, it is performed with the ſame precaution: when wearied no blows can provoke them to proceed. They feed as they go along on the graſs they meet with in their way; but they never eat in the night, making uſe of that time to ruminate. When they ſleep or ruminate, they reſt with their feet folded under their bellies. If overloaded or too much fatigued they ſink down, and will not riſe again though the driver ſhould beat them with the utmoſt force; and if the driver continues his torments, the animal grows deſperate, and deſtroys himſelf by beating his head againſt the earth.

This animal may be truly conſidered as the camel of Peru. Even before the diſcovery of South America by the Spaniards, the lamas were domeſticated, and employed as beaſts of burthen by the Peruvians. At preſent they are preferred to horſes by travellers paſſing over the mountainous regions of this part of the world. Cozer, who lately made a journey of obſervation in Peru, tells us the Spaniards harneſs them, and employ them for the conveyance of merchandiſe in the ſame manner as the Peruvians did in former days. A good lama coſt him eighteen ducats; but the ordinary price is from twelve to thirteen ducats each. The fleſh of the young lamas is excellent; that of the old ones is dry and tough. The wool is valuable: the Indians make ſhoes of the ſkin, and the Spaniards uſe it for harneſs. Theſe uſeful and even neceſſary animals in the country they inhabit are attended with no expence to their maſters; as they are cloven footed, they do not require ſhoes, and their wool renders ſaddles unneceſſary. Satisfied with a ſmall portion of vegetables, or graſs, they want neither corn nor hay; and they are ſtill more moderate in what they drink, as their mouths are continually moiſtened with ſaliva, which they have in greater quantity than any other animal.

The lamas Buffon ſuppoſes to be confined to that chain of mountains which ſtretches from New Spain to Terra Magellanica, and he therefore concludes that they are the natural inhabitants of the higheſt regions of the globe, and require a purer and more rarefied air than that of our higheſt mountains in Europe. A recent writer, in an anonymous hiſtory of Peru lately publiſhed, obſerves, that the animals named llamas, pacos, vicunas, and huanacos, are natives of the lofty mountains of that country; and ſtates as a ſingular particular, that although thoſe mountains extend, under the denomination of Cordilleras, to ten degrees of north latitude, with pretty nearly the ſame proportion of elevation and cold, theſe animals do not paſs from the line towards the north, and are conſequently not to be found in the provinces of Quito, Santa Fé, and others, where the climate of the mountains at leaſt is analogous to that of high Peru, in which latter territory the animals in queſtion live naturally, and multiply their ſpecies. The ſole reaſon adduced, to account for this extraordinary circumſtance, is, that throughout the whole extent of the northern mountains of the Cordilleras, a kind of paſture which the Peruvians name *ycho*, or *ychu*, and which is denominated by the authors of the Flora of Peru *xarava*, is not to be found. This plant belongs to the gramineous tribe, and appears to be the natural food of theſe animals. It is extremely abundant in the mountains of Peru; but in thoſe of Quito, Santa Fé, &c. obſervers have not hitherto ſucceeded in aſcertaining its preſence.—This plant has been called by ſome *ichu*, and *pajon*: it is deſcribed flouriſhing luxuriantly on the loftieſt pinnacles of thoſe mountains amidſt the ſnow and ice with which they are perpetually overmantled.

The lamas couple with difficulty from a natural defect in the ſtructure of the ſeveral organs of both male and female. It is oftentimes the labour of ſome hours, or even of a whole day, all which time is ſpent in growling, quarrelling, and ſpitting at each other. The Indians aſſiſt them on ſuch occaſions. They go with young five or ſix months, and ſeldom produce more than one at a birth. The female parent has two teats, and the young one follows her as ſoon almoſt as it is brought forth.

This animal is known by various names among old writers: it is called *ovis peruanana*, Charlet; *ovis peruana*, and *pelon ichiatl oquitli*, Hernand. hiſt. Mexico; *hirſchcamel*, Geſn.; *camelus peruvianus*, *glama dictus*, Ray; *camelus pilis breviſſimis*, Briſſ.; *llama*, Ulloa voy.; and *lama*, Buffon.

Camelus *Huanacus*, the *huanaco*, or *guanaco* of Molina's Natural Hiſtory of Chili, is diſtinguiſhed ſpecifically, according to this author, by having the body hairy, back gibbous, and the tail erect.

This animal, which Buffon conſidered to be the ſame as the former ſpecies in a ſtate of wildneſs, is ſeparated from it by late authors with much propriety, on the authority of Molina. The Peruvians themſelves, as already intimated, make the ſame diſtinction between theſe two animals, ſo that we cannot heſitate to believe them different. It ſhould however be ſtated at the ſame time, that there are European naturaliſts of credit who coincide in ſentiments with Buffon to this day, that the huanaco is the original race from which the lama has proceeded.

Molina offers ſome cogent reaſons in ſupport of his opinion to the contrary. The lama, as he remarks, has the back nearly ſtraight or level; the four limbs of an equal length, and an excreſcence on the breaſt which is almoſt conſtantly humid with a yellowiſh oily ſecretion. The huanaco exhibits neither of theſe peculiarities, the back inſtead of being level is remarkable for its gibboſity; the poſterior legs are longer than the anterior ones, inſomuch, that in aſcending or deſcending precipices in the chace, it can bound and leap with aſtoniſhing velocity; and there is no trace of the pectoral bunch, ſo conſpicuous in the lama; it is beſides very far ſuperior in ſize, and differs in other leſs ſtriking particulars.

The huanacos are ſtronger, ſwifter, and of a more lively diſpoſition than the lamas: they run like a ſtag, and climb over the moſt craggy precipices with the agility of the goat; and their wool or hair is ſhorter. Their ſize is equal to that of the horſe; the length from the muzzle to the origin of the tail being about ſeven feet, and the height from four to five feet. The back is much arched; the head round, and noſe ſomewhat pointed; the ears ſtraight, and the tail ſhort and aſcending, or turned upwards as in the common ſtag.

Although theſe animals are entirely in a ſtate of freedom, they aſſociate in herds ſometimes to the number of two or three hundred. When a man approaches they regard him at firſt with aſtoniſhment, without expreſſing any fear, but ſhortly, as if by common conſent, they blow through their noſtrils, neigh like horſes, and then, by taking a general flight, ſeek a refuge on the tops of the mountains. They prefer the north to the ſouth ſide of the hills. They often remain above the ſnowy tracts of the mountains; and when travelling on the ice covered with hoar froſt, they ſeem to be in the beſt condition, appearing the more vigorous in proportion to the coldneſs of their ſituation. The natives of Chili hunt the huanaco for the ſake of its fleece: the dogs have much trouble to follow them, and if they can once gain the rocks, both the hunters and their dogs are oftentimes compelled to give up the chace. They are very numerous all along the chain of the Cordilleras, which are full three thouſand fathoms above the level of the ſea at Peru, and preſerve that elevation from Chili to the ſtraits of Magellan. At the beginning of winter they quit the higher parts of the mountains which they inhabit during the ſummer, and deſcend into the vallies or plains below in troops commonly of one or two hundred together. The adults run with prodigious velocity, inſomuch that they can be ſcarcely overtaken with the ſwifteſt horſe. The natives are dexterous in purſuing theſe animals, and ſometimes take them alive. The fleſh of the young ones, according to Molina, is as good as veal; that of the full-grown animals is hard and dry, but is better ſalted than freſh. The hair is employed in making caps or hats, and in the fabrication of ſome ſorts of Peruvian cloth.

Camelus *Arcuanus*, the *chilihuque*, or as ſometimes called the Peruvian camel, moutons de Perou, and aries moromorus, is another animal of this family: the body is woolly and ſmooth; ſnout curved upwards, and ears pendulous. It is thus ſpecifically deſcribed by Molina. upon whoſe authority it is inſerted by Gmelin, in his edition of the Linnæan Syſtema Naturæ, as a ſpecies diſtinct from the reſt.

This ſpecies inhabits Peru and Chili, and is deſcribed as meaſuring about ſix feet in length, and nearly four in height. It is covered with woolly hair, and in its general appearance is not unlike a ram. The ears are flaccid or pendulous, the neck and legs long; tail like that of a ſheep, but ſhorter in proportion; the wool is very ſoft, and the colour of the animal is ſaid to vary in different individuals, being either brown, black, aſh-coloured, or white. This animal was employed by the ancient inhabitants of Chili as a beaſt of burthen, as well as in ploughing; its wool was alſo uſed by them in the manufacture of a fine ſilky cloth, or ſtuff. Its fleece is employed for a ſimilar purpoſe at this time.

CAMELUS *Vicugna*, has the body ſmooth and woolly; noſe flat, blunt, and tail erect. Molin. Hiſt. Nat. Chili. *Vicuna*, *Vicuñna*, and *Vicunnas*, *Vicognes*, and *Vigogne* of different authors.

The vicuna bears a general reſemblance to the glama, but is of a lighter and more delicate appearance, and of a ſmaller ſize; the head ſmaller, and ſhorter in proportion; the eyes remarkably large and full; the ears ſomewhat ſharper; and the limbs more ſlender. The colour on the upper parts is a reddiſh brown, and the remainder of an iſabella colour, except the breaſt, belly, inſides of the thighs, and under part of the tail, which are white. The hair of this animal is of a very ſoft, wavy, and woolly nature, that on the breaſt is nearly three inches long; on the other parts not more than one inch; the end of the tail is furniſhed like the breaſt with long woolly hair. The individual deſcribed by Buffon was of a ſomewhat fierce diſpoſition, and frequently attempted to bite thoſe who examined it. It was never obſerved to drink, and ſeemed to have the ſame general habits and manners as the glama.

This animal inhabits the loftieſt ſummits of the Andes, and is allowed to afford a much ſuperior wool to that of either of the former ſpecies. It was once domeſticated in Peru as the lama is at preſent; but the breed is now loſt, and they are only to be found at this period in a ſtate of nature among the mountains. The natives often go in purſuit of the vicunas which they chaſe with dogs, or take by ſtratagem, and kill them chiefly for the ſake of their wool. It is clearly proved from paſt experience, that theſe uſeful animals might be domeſticated with eaſe, and that their domeſtication would be attended with conſiderable advantage to individuals, and benefit to the ſtate, were proper regulations adopted for this purpoſe. But unleſs ſome ſalutary meaſures are taken, there is reaſon to believe the whole race of theſe animals will be exterminated in a few years. When the Indians go out in chace of them, their only object is to deſtroy as many as poſſible. It was no uncommon circumſtance till of late years for a troop of theſe hunters to return home from the purſuit with the ſkins of five hundred, or perhaps a thouſand of theſe animals. The hair is ſold to the merchant upon the ſkin, that he may be aſſured it is the genuine product of the vicuna, and not of the paco, which is rather of a coarſer quality. Very fine cloth is woven with the vicuna wool, both in Peru, and in Spain, to which country it is exported from Peru. Buffon ſuppoſes the vicuna would be a valuable acquiſition to Europe, could the breed be introduced, and propagated with ſucceſs: he is led to imagine that they would thrive well on the Pyrennées and the Alps, nor is this improbable. It ſeems indeed to be in the contemplation of the preſent government of France, to bring the experiment to iſſue by the introduction of theſe animals from Peru into thoſe mountainous regions, as Buffon ſuggeſted; ſo fully are the French agriculturiſts of this time ſatisfied of its practicability, and of the ſucceſs that would attend it.

In the year 1774, a cloth-worker in Paris of the name of Breton, fabricated a piece of cloth of the vicuna wool, in its natural colour, which anſwered extremely well, and was ſubmitted to the inſpector general of commerce as an eſſay deſerving the attention of government, and likely to become an object of public utility. He alſo dyed pieces of this cloth of various colours, as dark and light blue, crimſon, violet or purple, and ſcarlet, and all with an equal degree of ſucceſs. Other experiments were alſo tried by the French manufacturers ſhortly after that time. Shawls in particular, formed of the vicuna wool, under the direction of M. Decretot of the Louviers, are reputed to have been of great beauty; and in the delicacy of texture, and ſoftneſs, to emulate the rich ſhawls of Caſhmire. Theſe particulars will be ſufficient to ſhew of what real utility the cultivation of the vicuna with due attention might become hereafter in Europe.

CAMELUS *Paco*, the *paco*, *alpaco*, and *alpaque* of various authors, an animal nearly reſembling the vicuna, and ſpecifically diſtinguiſhed by having no bunches; body woolly; and ſnout oblong.

This ſpecies is ſaid to be entirely confined to Peru, where the natives keep vaſt flocks of them for the ſake of their wool, of which they prepare cloth of a ſilky luſtre and ſoftneſs: Like the Vicuna, it is found in mountainous diſtricts in large herds, but is never obſerved to aſſociate with thoſe animals. Some ſay it is of a more robuſt make than the vicuna, and is covered with very long wool, which, in the wild animal, is of a dull purple colour, beneath white, and when tamed, varying with black, white, and tawny.

The pacos are conſidered as a ſubordinate kind of animal to the lamas, much in the ſame proportion as we value the aſs with regard to the horſe: they are ſmaller, and not ſo ſerviceable, but their fleeces are more uſeful. Their wool is fine and long, only of a coarſer quality than that of the vicuna, and, with the latter, forms a conſiderable article of merchandiſe in South America.

In a domeſtic ſtate, the pacos are called by the Peruvians alpaques. The natural colour of the wool or fleece of the wild pacos, which reſembles that of a duſky roſe, or rather more inclining to purpliſh brown, is ſo fixed, that it undergoes no alteration under the hands of the manufacturer. They not only make good gloves and ſtockings of this wool, but alſo weave it into quilts and carpets, which ſell at a high price, and form a valuable part of the Spaniſh commerce. The pacos poſſeſs many things in common with the lamas: they belong to the ſame country, and are nearly of the ſame diſpoſition and manners: they bear much reſemblance in figure to the lamas, but are ſmaller: their legs ſhorter, and their muzzles thicker and cloſer.

The wild pacos inhabit and paſture on the higheſt parts of the mountains. Snow and ice ſeem rather to refreſh than to be inconvenient to them: they keep together in flocks, and run ſwiftly. They are timid animals, for as ſoon as they perceive any perſon, they take flight, driving their young before them. The ancient monarchs of Peru rigorouſly prohibited the hunting of them, becauſe they multiply ſo ſlowly; but ſince the arrival of the Spaniards in thoſe parts, their number is greatly decreaſed. The fleſh of theſe animals is not ſo good as that of the huanaco: they are chiefly ſought after for their fleece, and the bezoars they produce. The method of taking them proves their extreme timidity. The hunters drive a flock of them into a narrow paſſage, acroſs which they have ſtretched cords about four feet from the ground, with a number of pieces of linen or woollen cloth hanging to them. The animals are ſo intimidated at theſe rags, agitated by the wind, that they ſtop, and crowding together in a heap, are killed with the greateſt eaſe. But if there happen to be any of the huanacos among the flock, as they are leſs timid than the pacos, they leap over the cords, and the example being followed immediately by the whole drove, they eſcape for that time from their purſuers.

As to the domeſtic pacos, they are employed to carry burthens, like the lamas, but they can only bear a much leſs weight in proportion to their ſize than the lama, ſeldom carrying more than from fifty to ſeventy pounds. They are, beſides, of a more ſtubborn nature, and when once they lie down with their load, they will ſuffer any torment ſooner than riſe. The Indians never make uſe of the milk of theſe animals, becauſe they have ſcarcely enough to ſupply their own young. The great profit derived from their wool induced the Spaniards to endeavour to naturalize them in Europe: they tranſported numbers of them to Spain with this view, but the climate not agreeing with their nature, they all died. Thoſe who brought them into Spain did not conſider, that they cannot exiſt even in Peru, but in the coldeſt regions, and on the ſummits of the loftieſt mountains: that they are never found in the vallies, and if tranſported to warm countries, cannot long ſurvive the change from their natural climate. Had they been ſent to the Pyrennées, or other Alpine regions, it is poſſible they might have aſcended the mountains till they found of themſelves a climate ſuited to their nature. At leaſt, the experiment muſt be ever fruitleſs, unleſs they can be accommodated with a climate as nearly agreeing with their own as the coldeſt parts of Europe will allow.

Such animals as ſubſiſt on vegetables, and live on the high mountains of Aſia and Africa, produce that kind of animal concretion called bezoar, the virtues of which were formerly ſo highly extolled. The pacos produce that particular ſort known by the name of occidental bezoar, in great abundance, as do alſo the huanacos, and the reſt of the lama tribe, or Peruvian camels; but it is only from thoſe animals, when in a ſtate of nature, that bezoar of any value can be obtained. See Bezoar.

The paco is conſidered by ſome naturaliſts as an animal forming an intermediate ſpecies between the lama and vicuna. Molina, in his "Voyage to Chili," has given a good deſcription of the paco, the reſult of which proves, that the paco is more robuſt than the vicuna, has a much longer muzzle, and fleece of longer wool, but not ſo fine. The Peruvians keep vaſt flocks of them for the ſake of their wool, with which they fabricate ſtuffs that have the brilliancy of ſilk. This animal, which appears, however, to be ſo abundant in Peru, we are told, is not found in Chili, either wild or in a ſtate of domeſtication.

Camelus, in *Zoology*, a ſpecies of Trichoda, found in vegetable infuſions. This is thickiſh, hairy before, and emarginate on each ſide in the middle. Müll. Zool. Dan.

Camelus, camelus indicus, camelus indicus verſicolor, and camelopard of different writers are ſynonyms of the Linnæan cervus camelo-pardalis, and Gmelinian Camelopardalis *Giraffa*, which ſee.

CAMEN, or Kamen, in *Geography*, a town of Germany, in the circle of Weſtphalia, and county of Marck; 20 miles S. of Munſter.

CAMENZ, a town of Luſatia; 21 miles N.E. of Dreſden, and 13 W.N.W. of Budiſſen.

CAMERA, in *Antiquity*, derived from the old German *Cam*, *Cammer*, crooked, whence our Engliſh *kembo*, arms in kembo. At firſt it ſignified any winding or crooked plat of ground, as "unam cameram terræ," *i. e.* a nook of land. Afterwards the word was applied to any vaulted or arched building; and it was uſed in the Latin law-proceedings for the judge's chamber, &c. "camera ſtellata," the ſtar-chamber, &c.

Camera, or Cameria, called alſo *Camers*, in *Geography*, a city of great note in Umbria. See Camerina.

Camera, *Ital.* a chamber. This word, when joined to another, becomes a *muſical* term: as *muſica di camera*, compoſitions for a ſmall band; *voce di camera*, a feeble voice.

*Muſica di camera* is one of the three ſpecies of compoſition under which all muſic may be compriſed: as *muſica di chieſa*, church muſic; *muſica teatrale*, theatrical muſic, including muſic for public concerts; and *muſica di camera*, chamber muſic.

Camera *Æolia*, a contrivance for blowing the fire, for the fuſion of ores, without bellows; by means of water falling through a funnel into a cloſe veſſel, which ſends from it ſo much air or vapour as continually blows the fire: if there be the ſpace of another veſſel for it to expatiate in by the way, it there lets fall its humidity, which otherwiſe might hinder the work. The contrivance was named *camera Æolia* by Kircher. Hook, Phil. Coll. N° 3. p. 80. See Bellows.

Camera *lucida*, a contrivance of Dr. Hook for making the image of any thing appear on a wall in a light room, either by day or night. Oppoſite to the place or wall where the appearance is to be, make a hole of at leaſt a foot in diameter, or if there be a high window with a caſement of this dimenſion in it, this will do much better without ſuch hole, or caſement opened. At a convenient diſtance, to prevent its being perceived by the company in the room, place the object or picture intended to be repreſented, but in an inverted ſituation. If the picture be tranſparent, reflect the ſun's rays by means of a looking glaſs, ſo as that they may paſs through it towards the place of repreſentation; and to prevent any rays from paſſing aſide it, let the picture be encompaſſed with ſome board or cloth. If the object be a ſtatue, or a living creature, it muſt be much enlightened by caſting the ſun's rays on it, either by reflection, refraction, or both. Between this object and the place of repreſentation put a broad convex glaſs, ground to ſuch a convexity, as that it may repreſent the object diſtinctly in ſuch place. The nearer this is ſituate to the object, the more will the image be magnified on the wall, and the further the leſs; ſuch diverſity depending on the difference of the ſpheres of the glaſſes. If the object cannot be conveniently inverted, there muſt be two large glaſſes of proper ſpheres, ſituate at ſuitable diſtances, eaſily found by trial, to make the repreſentations erect. This whole apparatus of object, glaſſes, &c. with the perſons employed in the management of them, are to be placed without the window or hole, ſo that they may not be perceived by the ſpectators in the room, and the operation itſelf will be eaſily performed. Phil. Tranſ. N° 38, p. 741, ſeq.

Camera *Obſcura*, or Dark Chamber, in *Optics*, a machine or apparatus ſo conſtructed, that principally by means of a convex glaſs, or a convex glaſs and plane mirror, the images of external objects are repreſented on a rough ground plane glaſs, white paper, white wall, or other ſurface, in the moſt vivid and diſtinct manner, with all their natural motions, colours, ſhades, &c. The firſt invention of the camera obſcura has been aſcribed to Baptiſta Porta.—See his Magia Naturalis, lib. xvii. cap. 6. firſt publiſhed at Frankfort about the year 1589 or 1591. The firſt four books of this work were publiſhed at Antwerp in 1560. But Dr. Freind, in his "Hiſtory of Phyſic," (vol. ii. p. 236) obſerves, that friar Bacon, who flouriſhed in the beginning of the 13th century, deſcribes the camera obſcura, and all ſorts of glaſſes, which magnify or diminiſh any object, bring it nearer to the eye, or remove it farther off. See alſo Bacon's "Opus Majus" by Dr. Jebb, p. 236; and his Epiſtle "ad Pariſienſem," and his "Perſpective" cited by Dr. Plott in his "Hiſtory of Oxfordſhire," p. 215; from which we may conclude, that he had a very accurate and extenſive acquaintance with the properties of various kinds of glaſſes.

Camera *Obſcura*, *the uſe of the*, is manifold: it aſſiſts very much in explaining the nature and rationale of viſion, and hence by ſome it has been compared to the artificial eye. It exhibits the moſt ſtriking and entertaining repreſentations of objects of all deſcriptions, whether near or diſtant, in their true perſpective, the colouring juſt and natural, their light and ſhadows correct, and all their motions and relative poſitions according to the original. By means of this inſtrument, a perſon however unacquainted with drawing, may delineate objects with great facility and correctneſs; and to the ſkilful artiſt it will be found indiſpenſably uſeful in comparing his ſketches with the perfect repreſentations given in the camera, and by obſerving his defective imitations, he may correct, as much as poſſible, his deſigns. To the delineations of that beautiful repreſentation called the *Panorama*, this inſtrument has proved of eſſential uſe.

Camera *Obſcura, the theory of the*, is contained in the following propoſition.

If an external object, as A, *Plate* III. *Optics*, *fig*. 1, radiates its light through a ſmall aperture C, in a ſhutter of a perfectly darkened room upon a white paper or painted ſcreen oppoſite to it, an image of the object will be depicted on the ſcreen in an inverted poſition. For the aperture C being ſuppoſed very ſmall, the rays iſſuing from the point B will fall on *b*: thoſe from the points A and D will fall on *a* and *d*; wherefore, ſince the rays iſſuing from the ſeveral points are not blended, they will, by reflection, exhibit its appearance on the ſcreen. But ſince theſe rays, A C and B C, interſect each other in the aperture, and the rays from the loweſt points fall on the higheſt, the ſituation of the object will neceſſarily be inverted. Hence, ſince the angles at D and *d*, and the vertical ones are equal at C, B and *b*, and A and *a*, will be alſo equal; conſequently, if the ſcreen where the object is delineated be parallel to it, *a b* : A B :: *d* C : DC.

That is, the height of the image will be to the height of the object, as the diſtance of the image from the aperture is to the diſtance of the object from the ſame. This proves, therefore, that the inverſion of the object is not owing to any lens that may be uſed in a camera obſcura. In this manner, the figures of the image are very faint and confuſed, for want of a due degree of light, and its proper refractions.

Camera *Obſcura, conſtruction of a*, whereon the images of external objects are diſtinctly repreſented in their genuine colours, light and ſhade, &c. and either in an erect or inverted poſition.

1. Darken, in the moſt perfect manner poſſible, a room or chamber; in the ſhutter of one of the windows that faces the object to be repreſented, cut a ſmall circular aperture, ſee *fig*. 1. C.

2. In this aperture fix either a double or plain convex lens; if the latter, with the convex ſide next the object. Its focus may be of any length between 3 and 6 feet.

3. At a proper diſtance, to be determined by experiment, or about the focal diſtance of the lens, place perpendicularly a large ſurface of white paper or cloth, and on this the images of the external objects directly before the lens will be beautifully delineated, but in an inverted poſition. The paper or cloth ſhould be moveable, ſo that the exact diſtance of the focus of the lens may be obtained, or the images will not be ſhewn with their utmoſt diſtinctneſs. Thoſe objects alſo ſhould be ſelected that are in the ſtrongeſt light, or illuminated by the ſun's rays. In northern latitudes at noonday, a window oppoſite the north is beſt; in the morning, facing the weſt, and in the evening facing the eaſt. In ſouthern latitudes a window facing the ſouth is beſt at noon. The ſhorter the focus the ſmaller and brighter the images will appear; and the longer, the larger the objects; but if the focus be very long, from 20 to 30 feet, the ſame light being more dilated or ſpread over a large ſurface, the images will appear ſomewhat obſcure, and the colouring fainter. The images will be ſtill brighter if the ſpectator firſt ſtay a quarter of an hour in the dark.

This is the moſt perfect method of obtaining a repreſentation of objects, from having but one refracting medium, but in ſome caſes the inverted poſition of the images may be ſome objection; to obviate which, the following methods may be uſed to make the picture erect. Hold a true ground plain mirror ſlantwiſe againſt your breaſt, under an acute angle, and looking therein, you will ſee all the images reſtored to their natural and erect poſition, and with an addition of luſtre that they will receive from the reflection of the mirror. Or, which is a better way, and does not require a mirror near ſo large, place a mirror above and rather near the lens, ſo as to reflect the rays down upon a white ſurface, a ſcreen directly under, or parallel to the mirror. Or, a large concave mirror may be placed before the picture, at ſuch a diſtance that the image of the picture may appear before the mirror, which will then be erect, and appear pendant in the air. Another method, which is more direct, is by placing another convex lens in a partition behind the paper or ſcreen, with the image at twice the focal diſtance of the ſaid lens, the axes of the two lenſes coinciding, in which caſe another picture of the images will be formed but erect, as large as the firſt, but not ſo bright, and with a contracted field or extent of the picture. Or, two lenſes of ſhort foci in draw-out tubes, may be applied to the hole in the ſhutter inſtead of one, which will alſo produce an erect poſition of the images, but the light will be leſs, the extent very limited, and ſerve only for the repreſentation of buſts, ſmall figures, &c. as hereafter to be deſcribed. This method is but of little uſe and ſeldom practiſed.

The following deſcription of cameras obſcuras has been communicated to us by Mr. William Jones, optician, Holborn, as being the moſt commodious and perfect, and what have been preferred, and are in general uſe, by the moſt ſkilful artiſts:—

*Fig*. 2. repreſents the ſcioptic ball, which is made of mahogany, and conſiſts of three parts, a frame, a ball, and a lens. The frame conſiſts of two pieces in a circular ſcrew rim, fitted one to the other, and both ſo excavated as to admit, and keep ſteady a ſpherical ball perforated, which is voluble in its frame more or leſs eaſily, as the parts of the frame are leſs or more ſcrewed together. At each end the hole in this ball is a ſcrew cell for containing a lens; theſe lenſes are of different focal lengths, and only one is to be uſed at a time, when the images are to be formed. The frame of this ſcioptic ball is to be ſcrewed faſt to the window ſhutter or window board of a well-darkened room, before a hole previouſly made therein. There are two braſs nuts and ſcrews, *a*, *b*, fitted to the frame for that purpoſe; the nuts are ſcrewed to the ſhutter or board, ſo that by means of the ſcrews the ſcioptic ball may be the more readily attatched to, or detached from, the ſhutter. This apparatus is very convenient, when experiments by a variety of lenſes may be deſired. A, *fig*. 2, repreſents the poſition of a mirror when applied for reflecting downwards the images in order to obtain the erect poſitions; if the frame be made to turn on an hinge, it will be the more uſeful to direct the image to an oblique ſcreen, or table, as may be required. *Fig*. 1. repreſents a darkened room with a lens attached to the ſide or ſhutter, or where the ſcioptic ball is to be placed. E repreſents the moveable white paper ſcreen that receives the images of the objects formed by the lenſes, and is moveable to the diſtance of the focal length of the glaſs. A B ſhews the manner in which the buſt, ſtatue, or picture, may be fixed on a ſupport on the outſide of the window, ſo that an image may be formed upon the paper within, from which the artiſt is to copy or delineate. For ſuch proximate objects the focus of the lens muſt be ſhort, from 9 to 12 inches, or the ſcreen will be required to be at too remote a diſtance from the lens. When the diſtance of the object and the image are the ſame from the lens, the image will be of the ſame ſize as the object. When the object approaches nearer, the image will recede and enlarge, and *vice verſâ.*

### *To exhibit Solar Phenomena by means of the Scioptic Ball and Socket.*

The ſcioptic ball affords a very convenient method of forming an image of the ſun in the darkened room. If a lens 10 or 12 feet focus be placed on it, and a white paper ſcreen placed at its focus, in a perpendicular poſition to the rays, a diſtinct image of the ſun will be formed, about one inch diameter, on which will be conſpicuouſly exhibited all the ſpots or ſolar maculæ. At the time of a ſolar eclipſe, the whole progreſs of the moon, from the time of the firſt contact of the limbs to the laſt, may, in this way, be obſerved very diſtinctly. But the beſt method is by connecting a draw-out teleſcope, with the ball of the ſocket, *fig.* 2. by ſcrewing the end with the object glaſs to it, and taking out all the eye glaſſes at the other end, except the one next to the eye, then moving inwards the firſt tube till the image of the ſun appear diſtinct; and you will have a bright image from 12 to 20 inches diameter, according to the diſtance of the ſcreen, which will, to any number of ſpectators, exhibit the ſolar phenomena intended to be viewed.

### *Conſtruction of a Chamber Camera Obſcura.*

The foregoing is the readieſt and moſt ſimple method of converting a room into a camera obſcura, but it is attended with theſe objections, that it only ſerves for objects directly facing the lens, and occaſions always the trouble of darkening the room, fixing and adjuſting the apparatus, &c. *Fig.* 3. repreſents a roof ſhaded like a dome or cupola, placed over a building, proſpect-room, or temporary room erected for the purpoſe of a camera obſcura, and in this way affords the moſt ready and advantageous plan for all ſurrounding objects. The whole dome A B may be made to turn round on friction wheels, in a groove made in the roof for that purpoſe, and to carry round with it the glaſſes in the box C above, or which, in ſome caſes, is a more manageable way, the box with the glaſſes is made moveable in a groove round upon the dome, and is turned by means of a long rod by a perſon within. The manner of fabricating ſuch a dome and box will be evident to any good joiner by a mere inſpection of the figure. The mahogany box C is of a cubical form about 6 or 7 inches in the length of a ſide; a true ground mirror in a frame is placed diagonally in the box, and is moveable ſomewhat on an axis at its lower edge upwards and downwards, to reflect the rays from objects at various diſtances; underneath this mirror, in a round cell, at the bottom of the box, is fixed a double convex lens, about 6 or 8 feet focus, and 4 or 4½ inches in diameter: this lens will form upon a white table D, placed on the floor below, the images of the objects reflected by the mirror above, at the focal diſtance of the lens. The diameter of this table ſhould be 2½ or 3 feet, excavated on its ſurface to a ſmall degree of concavity, or from a radius about the focus of the lens, in order, that the inequality of the diſtance of its ſurface from the centre of the lens, preſenting the images indiſtinct at the circumference, when they are clear in the middle, may be obviated. The ſurface muſt be painted perfectly white, or, which is better, covered with a thin coating of plaſter or ſtucco. The pillar of the table ſhould be made with a ſcrew working in a female one cut in the pedeſtal, ſo that by turning round the table and ſcrew its ſurface may either be elevated or depreſſed, as may be neceſſary, to admit of the cleareſt and beſt defined picture of the images poſſible. To perſons having dwellings upon elevated ſituations commanding extenſive proſpects over countries, rivers, the ſea, &c. a machine of this kind conſtructed over it will afford more delight and entertainment, as well as uſe to an artiſt, than any perſon would imagine, who had not previouſly been a witneſs to ſuch an effect. To thoſe who may not wiſh to be at the expence of a dome, Mr. Jones recommends the box fitted to a wooden pyramidical trunk, (ſee *fig.* 4,) which trunk can be fixed on the ridge of the roof of a houſe or chamber, by a common carpenter, and a flat ſliding cover to ſlide on at A, to cover the trunk when the box of glaſſes B is taken away after uſe. The camera boxes, with the glaſſes complete, and ready for fixing, are made by Meſſrs. Jones, of Holborn, and other Opticians. Metallic mirrors have been uſed inſtead of glaſs ones for cameras; they reflect more light, and conſequently ſhew the images brighter, but their liability to tarniſh and corrode is an inſurmountable objection to their general uſe.

CAMERAS *Obſcuras, conſtruction of portable.* The glaſſes of a camera obſcura are frequently fitted to a portable machine ſhutting up in the form of a cheſt, or book, ſo as to be portable, and eaſily tranſported from place to place, and carried about by the artiſt. The apparatus within is contrived to fold outwards, and form a machine as repreſented at *fig.* 5, and it is contrived upon the moſt convenient plan of any hitherto conſtructed. It is repreſented as placed together for uſe. The lid front A, and the ſlides, one ſhewn at B, by means of hinges turn up to the height of about two feet from the caſe C D E, and are faſtened together by ſmall braſs hooks. The head and ſliding box, with glaſſes F, alſo faſten on by hooks within. The lens of about 25 inches focus is placed under the true parallel glaſs mirror, and forms the images on a white ſheet of paper, placed in the bottom of the cheſt. To view the images the face is applied cloſe to a piece under A for that purpoſe, and to trace the outline, or copy them, the arm at the ſame time is applied in the cloth ſleeve under H. The box F ſlides on a ſquare tube, and by means of a braſs rack and pinion G the lens is adjuſted, while the images are viewing, to its proper focal diſtance from the white paper below. The images formed on the paper have a correct and natural reſemblance to the original objects; no inverſion takes place, and even names and letters on objects are in their direct order. This camera is converted into an inſtrument for magnifying perſpective prints and drawings, and forms the beſt poſſible apparatus for that purpoſe. The head F G and tube are to be entirely removed, as well as the front A, and cloth C D, and another head with a diagonally-placed mirror and large convex lens, *fig.* 6. ſubſtituted, and alſo hooked on. The prints are to be placed at the bottom of the cheſt, and as the camera caſe is open, the print will be illumined either by day light or candle light, as required. The print is viewed by reflection in an horizontal direction, by the eyes being placed before the large convex lens. When the ſides and front are unhooked and folded down into the cheſt, they all lie cloſe, and admit the head to lie under them; and the dimenſions of the cheſt, when thus ſhut up, do not exceed 2 feet in length, 20 inches in breadth, and 5 inches in depth.

The moſt portable kind of Camera obſcura is that repreſented at *fig.* 7, and is that moſt frequently uſed among artiſts, on account of its convenient dimenſions. The images are reflected on a rough ground plane glaſs, and are more vivid than thoſe formed on paper, by the Camera above deſcribed. It is made of mahogany, and of various dimenſions, ſome ſo ſmall as to be carried in the pocket. The lens at the front A is fixed in the cell, in the front of a ſquare draw-out tube, and is of a focus equal to the length of the box when the drawer is half drawn out; and a plain mirror is placed diagonally at the angle of 45°, at the end of the box, as ſhewn by the dotted line *a b*, which reflects the rays tranſmitted by the lens up to the upper ſide of the plane rough-ground glaſs, the rough ſide placed above, under the folding darkening cover, and there forming the images of the objects before the lens at A: the uſe of the draw is to adjuſt the proper diſtance of the lens from the mirror, according to the variable diſtances of proximate objects. The images on the rough glaſs exhibit a beautiful perſpective picture, alſo the profile of a perſon ſeated in a room in a ſtrong light before the camera, and more particularly if the ſun illumine the object; and may be readily traced on the rough ſurface of the glaſs by a black lead pencil, or by what is preferable, red French chalk, and then white paper being gently placed on the glaſs, the lines will be taken correctly off. If very thin white paper is merely placed upon the glaſs, the images may be diſcerned, though faintly, ſufficient to afford the means of tracing correctly. The nearer the object or features are to the camera the larger will be the image, and an additional lens of a ſhorter focus is ſometimes fitted to be ſubſtituted for the other, when the images of very near objects are wanted. Some artiſts who take profiles take out the rough glaſs from its cell, invert the camera, and by a ſtand ſupport it about 10 or 12 inches above the white paper on the table. The image will then invertedly be formed on the paper, and they trace it with a pencil in a correct manner, and with leſs trouble than by the other method. Meſſrs. Jones, of Holborn, make an improved camera of this kind, by joining the ſide of the camera and drawer in the middle with canvas cloth, as ſhewn at the lines B G: the back C turns inward with the mirror, cloſe up to the rough glaſs, and the front E F above, over the top, ſo that the whole camera may fold down into a flat form, and go into a very portable flat leather ſtrap caſe, making it the moſt portable poſſible for perſons travelling. Incluſive of the rough glaſs has ſometimes been placed a double convex lens to relieve the images, and from more light being thus refracted, the images are ſhewn with great beauty and extraordinary brightneſs, even ſurpaſſing the original. They are alſo more vivid when the rough glaſs is placed over this lens, though the contours, or outlines, are not ſo ſharp or diſtinct as when the rough glaſs is uſed only by itſelf. This improvement was aſſumed ſome years ago, by a perſon of the name of Storer, as a diſcovery, and called a *delineator*, but without the leaſt pretenſions, it being previouſly well known by the moſt eminent opticians, and it was, in the year 1758, noticed by Mr. Hooper, in his Rational Recreations, vol. ii. p. 29. Guyot's Recreations Phyſiques, tom. ii. recr. 35. art. 2. Mr. Harris, in his "Optics," b. ii. § 4. has deſcribed a variety of contrivances for converting the portable camera into a ſhew box for viewing prints.

CAMERARIA, in *Botany* (named by Plumier in honour of Joachim Camerarius jun. a phyſician and botaniſt of Nuremberg, who flouriſhed in the latter part of the 16th century, and publiſhed an improved edition of Matthiolus in Latin and German, and ſome other botanical works). Linn. gen. 300. Schreb. 423. Willd. 484. Juſſ. 145. Vent. 2. 423. Claſs and order, *pentandria monogynia*. Nat. ord. *Contortæ*. Linn. *Apocineæ*.

Gen. Ch. *Cal.* perianth one leafed, ſmall, with five acute teeth. *Cor.* funnel-ſhaped; tube long, ſwelling out at the baſe and at the top; border flat, with five lanceolate oblique ſegments. *Stam.* filaments five, ſmall, attached to the middle of the tube; anthers converging. *Piſt.* germs two, with lateral appendages; ſtyle ſcarcely any; ſtigma obſcure. *Peric.* follicules two, horizontally reflexed, oblong, compreſſed, obtuſe at both ends, with two oppoſite lobes at the baſe of each. *Seeds* numerous, egg-ſhaped, compreſſed, with a membranous ring at their baſe by which they are attached to the receptacle lengthwiſe in a ſingle row, an imbricated manner, and inverted direction.

Eſſ. Ch. *Corolla* contorted. *Follicules* two, horizontal. *Seeds* inſerted by a membrane.

Species, 1. C. *latifolia*, baſtard mangeneel, Linn. Sp. Jacq. Amer. 37. tab. 182. Plum. ic. 72. fig. 1. Brown. Jam. 182. Lam. Illuſt. Pl. 173. fig. 2. "Leaves egg-ſhaped, acute at both ends, tranſverſely ſtriated." A tall elegant tree, about 30 feet high, abounding with an acrid milky juice. *Trunk* ſtraight and thick. *Branches* generally dichotomous. *Leaves* oppoſite, petioled, entire, rather ſtiff, ſhining. *Flowers* white, peduncled, terminating the branches. A native of the Weſt Indies and South America. 2. C. *zeylanica*, Willd. Retz. Ob. 4. p. 24. (Apocin-Nerium, Linn. Zeyl. 404. "Leaves oblong, egg-ſhaped, acuminate, tranſverſely ſtriated in terminal and axillary corymbs. Its leaves are longer and flowers ſmaller than thoſe of the preceding ſpecies. A native of Ceylon. 3. C. *lutea*, Willd. Lam. Encyc. (C. Tamaquarina and Guianenſis, Aubl. 1. p. 260.) "Leaves oblong egg-ſhaped, reticularly veined; umbel peduncled, few-flowered." A ſhrub three or four feet high, four or five inches in diameter. *Stem* with a greeniſh ſmooth bark; branches long, ſtraight, ſubdivided. *Leaves* oppoſite, entire, ſmooth, on ſhort petioles. *Flowers* yellow, large, pedunculated, of a pleaſant ſmell, growing in umbels from the forks of the branches. A native of Guiana. Its branches, when cut, yield a milky juice. The Tamaquarina and Guianenſis of Aublet are ſuppoſed by La Marck and Willdenow to be only varieties of the ſame ſpecies. The flowers and leaves of the latter are ſmaller. 4. C. *anguſtifolia*, Linn. Sp. Plum. Ic. 72. fig. 2. Lam. Illuſt. Pl. 173. fig. 3. "Leaves linear." A ſhrub about eight feet high. *Stem* irregularly branching. *Leaves* oppoſite, entire. *Flowers* looſe, at the ends of the branches. It abounds with an acrid milky juice. A native of the Weſt Indies and South America.

CAMERARIA (Dillen.). See MONTIA *fontana*.

CAMERARIUS, or *Chamberlain*, in *Antiquity*, an officer who had the care of the dormitory in ancient religious houſes.

CAMERARIUS, JOACHIM, in *Biography*, an elegant German ſcholar and biblical writer, was born at Bamberg in Franconia in 1500; and was no leſs diſtinguiſhed for his eloquence than for his knowledge of the languages, hiſtory, mathematics, and politics. He was honoured with the friendſhip of Charles V., Maximilian II., and other princes; and by the diligence and zeal with which he delivered his lectures at Nuremberg, Tubingen, and Leipſic, he very much contributed to promote the cauſe of univerſal ſcience, and more eſpecially the ſtudy of elegant literature. He tranſlated from Greek into Latin, parts of Herodotus, Demoſthenes, Xenophon, Euclid, Homer, Theocritus, Sophocles, Lucian, Galen, Chryſoſtom, Theodoret, Ariſtides, Nicephorus, Gregory of Nyſſa, &c. He alſo wrote in Latin the lives of Melancthon and Heſſius: and compoſed "Commentaries on the New Teſtament," in which, ſays Moſheim (Eccl. Hiſt. vol. iv.), "he expounds the ſcriptures merely in a grammatical and critical manner; and laying aſide all debated points of doctrine and religious controverſy, unfolds the ſenſe of each term, and the ſpirit of each phraſe, by the rules of criticiſm, and the genius of the ancient language, in which he was a very uncommon proficient." The laſt edition of this commentary was printed at Cambridge in 1642. It is bound with Beza's Greek Teſtament, printed at Cambridge in the ſame year. Camerarius frequently quotes a MS. which he deſcribes as ancient, and which is noted 88 in the firſt part of Wetſtein's New Teſtament. He likewiſe publiſhed a catalogue of the biſhops of the principal ſees; Greek epiſtles; accounts of his journies in Latin verſe; epigrams of the ancient Greek poets; a commentary on Plautus; and ſeveral other learned works. Turnebus, H. Stephens, Lipſius, Beza, and many others diſtinguiſhed for their literature, concur in bearing ample teſtimony to his talents and learning. He died in 1574; and left ſeveral ſons, who were eminent for their literary attainments. Gen. Dict.

Camerarius, Joachim, a phyſician of learning and eminence, was born at Nuremberg in 1534, where he received the rudiments of his education. As his mind was early turned to the ſtudy of botany and medicine, with the view of improving himſelf, he viſited the principal ſeminaries in Germany, and thence went to Padua, and afterwards to Bologna, where he took the degree of doctor in 1562. Two years after he returned to Nuremberg, and by his ſuperior ſkill and ability, aided perhaps by the high character his father had borne, who was eſteemed one of the reſtorers of literature, he conciliated to himſelf the favour of the principal perſonages in the city. Under their patronage, in 1592, he founded a medical college, of which he was appointed dean or preſident, and in that ſituation continued to direct the affairs of the inſtitution for the remainder of his life. Mindful of his favourite object, botany, he formed an extenſive garden, ſtored with the choiceſt plants, the cultivation of which he ſuperintended with great aſſiduity. He alſo aſſiſted the landgrave of Heſſe with his advice in forming a botanical garden; and with a view of diſſeminating the knowledge of plants, he purchaſed the collections of Geſner and Wolfe, which he methodiſed, and corrected, and with conſiderable additions from his own ſtores, together with the works of Matthiolus, he publiſhed them in 1586, under the title of "De Plantis Epitome utiliſſima Petri Andreæ Matthioli novis Iconibus et Deſcriptionibus plurimis diligenter aucta," 4to. "Hortus Medicus et Philoſophicus, in quo plurimarum Stirpium breves Deſcriptiones, novæ Icones non paucæ, continentur," 4to. 1588. "Opercula de Re Ruſtica, quibus, præter alia, Catalogus Rei Botanicæ et Ruſticæ Scriptorum veterum et recentiorum inſertus eſt," 1577, 4to. Alſo "De recta et neceſſaria Ratione preſervandi a Peſtis Contagione," 1583, with other ſmall tracts on the ſame ſubject, and three centuries of emblems. On his death, which happened October 11, 1598, he was ſucceeded by his ſon Joachim, in his practice and in the honour of being dean of the college. Haller. Bib. Botan. Eloy. Dict. Hiſt.

Camerarius, Elias Rodolph, ſon of Rodolph John C. a phyſician of eminence at Tubingen, was born in 1640. Following the ſteps of his father, he was made doctor, and ſoon after profeſſor of medicine in the univerſity of Tubingen, which office he held to the time of his death, which happened on the 7th of June 1695. He was author of numerous diſſertations on the ſubject of medicine, in which are detailed ſuch rare caſes as had occurred in his practice. Among them, "Hiſtoria Anatomica Renum et Veſicæ," 1683, 4to. In this he gives an account of a diſſection of a perſon who died of an affection of the kidneys. Of one of the kidneys there only remained the external membrane, which was full of purulent matter, into which the kidney had been reſolved.

By his father "Sylloge Memorabilium Medicinæ, et Mirabilium Naturæ Arcanorum, Centuriæ iv.;" among them are two caſes containing accounts of a portion of the tongue being regenerated, after being removed by an operation. Haller. Bib. Med. et Chirurg.

Camerarius, Elias Rodolph, ſon of the former, profeſſor of medicine at the univerſity of Tubingen, and firſt phyſician to the duke of Wirtemberg, was author of numerous diſſertations and treatiſes on different branches of medicine, which appeared in ſucceſſion from the year 1691 to 1733. He was a learned and ingenious, rather, Haller ſays, than an experienced practical phyſician. His diſquiſitions are alſo on ſubjects that are rather calculated to gratify curioſity, than to advance our knowledge in the method of treating and curing diſeaſes: viz. "An liceat Medico pro Salute Matris Abortum procurare?" 1697, 4to.; "Machinæ Humanæ cum Thermometro, Barometro, et Hygrometro Analogia," 1721, 4to.; "De Calculis in Veſicula fellea repertis," 1724, 4to.; "Magici Morbi Hiſtoria attentius penſitata." Some however are practical. "De Podagra." "De Hydrope Uteri," &c. In his larger work, "Diſſertationes Taurinenſes Epiſtolicæ xx. ad illuſtres Germaniæ et Italiæ Medicos," Tubing. 1718, 8vo. he gives an account of ſome rare and unuſual complaints, which had fallen under his notice; among others, of catalepſy, of mania occaſioned by diſappointment in love cured by exciting terror, of loſs of memory occaſioned by a blow on the hinder part of the head, &c. Haller. Bib. Med. et Chirurg.

CAMERIA, in *Ancient Geography*, a town of Italy, in the territory of the Sabines, according to Livy; called *Camerium* by Pliny, and *Camaria* by Steph. Byz. and Dionyſ. Halic. The two laſt ſay, that it was a colony of citizens from the city of Alba.

CAMERINA, in *Geography*, a town of Italy, in the Eccleſiaſtical ſtate, and marquiſate of Ancona, near the Apennine mountains, the ſee of a biſhop immediately ſubject to the pope, and containing 19 convents; 71 miles N.E. from Rome, and 38 S.W. from Ancona. The ancient city of this name was treacherouſly ſurpriſed in the days of its glory by Dionyſius the tyrant, who delivered it up to the Carthaginians; and, deſtitute from that period of walls or fortifications, it was afterwards demoliſhed, and now lies buried under the ſand. Its territory belongs to the prince de Biſcaris, who has found a number of curious and valuable antiquities.

CAMERINUM. See Camarinum.

CAMERLINGO, or Camarlingo, the chamberlain of the pope's court, or the perſon who has the adminiſtration of the apoſtolical chamber.

The word imports as much as keeper of the chamber, or treaſurer; though the camerlingo has divers other juriſdictions which have no relation to the office of treaſurer. The name anciently denoted a *cubicularius*, or gentleman of the bed-chamber; but this is now expreſſed by *cameriere*. The camerlingo is the moſt conſpicuous officer in the court of Rome; becauſe all the revenues of the holy ſee are managed by the chamber of which he is preſident.

This office was anciently performed by the archdeacon of Rome, a dignity which was ſuppreſſed by pope Gregory VII. as of too great power and intereſt; inſomuch that he could often controul the pontiff himſelf, and generally by his intrigues raiſed himſelf to the papacy. In his ſtead was placed a cardinal, under the title of camerlingo, who is aſſiſted in his function by twelve prelates called clerks of the chamber, *clerici de camera*.

The cardinal camerlingo, on the death of a pope, does not enter the conclave with the reſt, to aſſiſt at the election of a new one, but ſtays without, keeps poſſeſſion of the pope's apartment in the Vatican; and whenever he goes abroad is attended by the Swiſs guards, like the pope himſelf. He even coins money in his own name, and with his own arms; and, in fine, is a kind of vice-pope, governing the eccleſiaſtical ſtate during the vacancy of the holy ſee.

The cardinals have alſo their camerlingo, or treaſurer of their college, diſtinct from that of the pope: the former is elected every year, whereas the latter is for life. The perſon choſen to this office has the receipt of all the revenues belonging to the college, which he is to diſtribute at the end of the year in equal portions to the cardinals then at Rome; thoſe who are abſent having no ſhare therein after they have been ſix months from court.

CAMERON, John, in *Biography*, one of the moſt famous divines amongſt the Proteſtants of France, in the 17th century, was born at Glaſgow, in Scotland, about the year 1580, and taught Greek there, till he removed to Bourdeaux in 1600. Here he acquired ſuch celebrity by the fluency with which he ſpoke Greek, that he was appointed to teach the learned languages at Bergerac. He afterwards became profeſſor of philoſophy at Sedan; but returning to Bourdeaux in 1604, he devoted himſelf to the ſtudy of divinity. Upon being appointed tutor to the ſons of the chancellor of Navarre, he accompanied them to Paris, Geneva, and Heidelberg. After having diſcharged the office of a miniſter at Bourdeaux, which he aſſumed in 1608, for 10 years, he accepted the profeſſorſhip of divinity at Saumur. Upon the diſperſion of that academy by the public commotions in 1621, he removed to England, and taught divinity at his own houſe in London. King James, inclined to favour him on account of his ſuppoſed attachment to the hierarchy, made him maſter of the college, and profeſſor of divinity at Glaſgow; but after holding this office, which he found to be unpleaſant to him, for a year, he returned to Saumur, where he read private lectures. From thence, he removed in 1624 to Montauban; where the diſturbances excited by the emiſſaries of the duke de Rohan, led him to remonſtrate againſt the principles which produced them, with more zeal than prudence. This occaſioned his being inſulted by a private perſon in the ſtreets and ſeverely beaten: and this treatment ſo much affected him, that he ſoon after died, in 1625, at the early age of 46 years. Bayle repreſents him as "a man of great parts and judgment, of an excellent memory, very learned, a good philoſopher, good-humoured, liberal not only of his knowledge, but his purſe, a great talker, a long-winded preacher, little verſed in the fathers, inflexible in his opinions, and inclined to turbulence." He was one of thoſe who attempted to reconcile the doctrine of predeſtination, as it had been taught at Geneva, and confirmed at Dort, with the ſentiments of thoſe who repreſent the deity as offering the diſplays of his goodneſs and mercy to all mankind. His opinion was maintained and propagated by Moſes Amyraut, and ſeveral others of the moſt learned among the reformed miniſters, who thought Calvin's doctrine too harſh. They were called Universalists. Cameron likewiſe maintained the poſſibility of ſalvation in the church of Rome. After his death, his theological lectures were printed at Saumur, in 3 vols. 4to. 1626-28, and afterwards with ſome additional pieces, at Geneva, in one vol. fol. His remarks on the New Teſtament, under the title of "Myrothecium Evangelicum," were printed at Geneva in 1632. Gen. Dict. Moſheim, E. H. vol. v.

Cameron, or the *Black Pagoda*, in *Geography*, lies on the coaſt of Golconda, in the bay of Bengal, between Manchepatam and Cape Palmiras.

Cameron, a river on the weſt coaſt of Africa, S.E. from Calabar river, the entrance of which is N. lat. 4°, and E. long. 11° 20′.

Cameron *Cape*. See Camaron.

CAMERONIANS, in *Eccleſiaſtical Hiſtory*, a ſect or party in Scotland, who ſeparated from the Preſbyterians in 1666, and continued to hold their religious aſſemblies in the fields.

The Cameronians took their denomination from Richard Cameron, a famous field-preacher, who refuſing to accept the indulgence to tender conſciences granted by king Charles II. as ſuch an acceptance ſeemed an acknowledgment of the king's ſupremacy, and that he had before a right to ſilence them, made a defection from his brethren, and even headed a rebellion, in which he was killed. His followers were never entirely reduced till the revolution, when they voluntarily ſubmitted to king William. The Cameronians adhered rigidly to the form of government eſtabliſhed in 1648.

Cameronians, or Cameronites, is alſo the denomination of a party of Calviniſts in France, who aſſerted, that the cauſe of men's doing good or evil proceeds from the knowledge which God infuſes into them; and that God does not move the will phyſically, but only morally, in virtue of its dependence on the judgment of the mind. They had this name from John Cameron, of whom an account has been given under the article Cameron.

The Cameronians are a ſort of mitigated Calviniſts, and approach to the opinion of the Arminians. See Universalists, *hypothetical*.

CAMEROTTA, in *Geography*, a town of Naples, in the Principato Citra; nine miles S.W. of Policaſtro.

CAMERTA, in *Ancient Geography*, a town to the right of the route from Otricoli to Rimini. Strabo.

CAMES, in *Geography*, a town of the iſland of Cuba; 40 miles W. of Bayamo.

Cames *Point*, a low point two leagues N. from Manta harbour, on the coaſt of Peru.

Cames, in the *Manufactures*, a name given to the ſmall ſlender rods of caſt-lead, of which the glaziers make their turned lead.

Their lead being caſt into ſlender rods of twelve or fourteen inches long each, is called the *came*; ſometimes alſo they call each of theſe rods a *came*, which being afterwards drawn through their vice, makes their turned lead.

CAMICUS, Camici, and Camicos, *Platonella*, or *Platoni*, in *Ancient Geography*, a town of Sicily, on the banks of a river of the ſame name, N.W. of Agrigentum. The river falls into the ſea near Capo Bianco, ſo called from its colour.

CAMIGARA, a town of India, on this ſide of the Ganges. Ptolemy.

CAMIGUIN, in *Geography*, one of the Philippine iſlands, about 10 leagues in circuit, and known by two high woody mountains. N. lat. 9° 30′.

CAMILIANUM, in *Ancient Geography*, a town of Italy, in Umbria, inhabited by the Camelani.

CAMILLA, in *Entomology*, a ſpecies of Papilio, (Nymph. Phal.) found in Europe. The wings are indented, black, gloſſed with blue, with a white band on both ſides, and ſpot of the ſame; poſterior wings beneath at the baſe ſilvery and immaculate. Fabr. &c. This is papilio lucilla of Eſper, and papilio rivularis of Scopoli. This ſpecies deſcribed by Eſper under the name of camilla, is not the above inſect, but the Fabrician P. lucilla.

CAMILLI and Camillæ, in *Antiquity*, boys and girls of ingenuous birth, who miniſtered in the ſacrifices of the gods; and eſpecially thoſe who attended the *flamen dialis*, or prieſt of Jupiter.

The word ſeems borrowed from the language of the ancient Hetrurians, where it ſignified *miniſter*, and was changed from *caſmillus*.

The Tuſcans alſo gave the appellation Camillus to Mercury, in quality of miniſter of the gods.

CAMILLUS, Marcus Furius, in *Biography*, one of the Patrician family of the Furii at Rome, by whom it was firſt raiſed to eminence. In the year of Rome 353 he ſerved the office of cenſor, and in the 10th year of the ſiege of Veii, A.U. 359. B.C. 395, he was created dictator, deſtined, ſays Livy, by the fates to take the city, and to ſave his country. After previous vows, Camillus prepared for proſecuting the ſiege with vigour; and having defeated the united force of the enemy in the field, he led his army to Veii. The aſſailants from without being aided by a choſen band who had entered the city by a mine which had been conſtructed under the walls, and carried as far as the citadel, Veii, which had been the rival of Rome in power, and its ſuperior in ſplendour, was obliged to ſurrender amidſt the ſhrieks and lamentations of the inhabitants, and after having exhibited a ſcene of blood and ſlaughter, which made even Camillus ſhed tears of ſympathy and compaſſion. Eſtimating the opulence of the city by the ſpoils which it yielded to the victors, and reflecting on the importance of this conqueſt, which had been delayed ten years, Camillus is ſaid to have lifted up his hands to heaven, and to have implored the Gods, that "if his own and the good fortune of the Romans appeared too great in their ſight, and that it was neceſſary to counterbalance it by ſome diſgrace, that they would be pleaſed to cauſe it to fall on him alone, and to ſpare the commonwealth." On the day after the capture of Veii, the priſoners were ſold for ſlaves, and the ſums thus raiſed remitted to the public treaſury. The triumph of the dictator was ſingularly magnificent, and the chariot of the victor was drawn by four white horſes; but the pomp and ſplendour of it offended the Roman people; and Camillus, who from this time was regarded as the head of the Patrician party, became an object of popular jealouſy. Camillus, however, after having fulfilled his vows, abdicated the dictatorſhip. Two years after this event, Camillus was again choſen one of the military tribunes, and entruſted with the conduct of an expedition againſt the Faliſci. Having inveſted Falerii, the capital of theſe people, an incident occurred, which afforded him an opportunity of diſplaying a degree of juſtice and generoſity, that was highly honourable to himſelf and to the Roman character. A ſchoolmaſter of the place, to whoſe care the children of all the moſt illuſtrious perſons were committed, contrived, under a pretence of exerciſing them in thoſe appropriate ſports to which they were accuſtomed, to bring them to the Roman lines; and, upon being led to the Roman general, he delivered them into his hands, informing him, that with theſe children, he in effect ſurrendered to him the town which he was beſieging. "Traitor," ſaid Camillus, with a menacing aſpect, "you do not addreſs yourſelf with your impious preſent either to a general or a people that reſemble you. We have indeed no expreſs and formal alliance with the Faliſci, but that which nature has eſtabliſhed between all men both does, and ſhall ſubſiſt between us. War has its rights, as well as peace; and we have learned to make it with no leſs juſtice than valour. We are in arms, not againſt an age which is ſpared even in cities taken by aſſault, but againſt men, armed like ourſelves; men, who without any previous injury from us, attacked the Roman camp at Veii. Thou, to the utmoſt of thy power, haſt exceeded them by a new and different kind of crime; but for me, I ſhall conquer as at Veii, by Roman arts, by valour, works, and perſeverance." After this reproof, Camillus ordered the traitor to be ſtripped, and to have his hands tied behind him; and providing his young ſcholars with rods, he directed them to drive him back into the city and to ſcourge him all the way. Upon their arrival, the citizens, overcome by this inſtance of generous conduct on the part of Camillus, ſent deputies to treat of a ſurrender. Camillus referred them to the ſenate, who admitted the Faliſci into the number of the allies of the Romans, on condition of their defraying the expences of the war. The noble general returned to Rome with a much more ſubſtantial glory than that of his ſuperb and pompous triumph after the capture of Veii. The army, however, was in no ſmall degree irritated by being diſappointed of its expected plunder.

Four years of turbulence ſucceeded the ſurrender of Falerii, during which Rome underwent the changes of a return to the conſular government, of an interregnum, and of a renewal of the adminiſtration by military tribunes. Whilſt the Gauls in their irruption into Italy had advanced as far as Cluſium in Etruria, the Romans were heedleſs of their danger; and encouraged a proſecution againſt their general Camillus, on a charge of having embezzled ſome of the ſpoils of Veii. Well informed with regard to the iſſue of this proſecution, he reſolved to prevent the indignity of a formal condemnation by a voluntary exile. Having taken leave of his family and friends, he advanced in ſilence towards the gates of the city; and then turning about and ſtretching his hands towards the capitol, he ſupplicated the Gods, "that if he were innocent, they would make his ungrateful country regret his abſence as ſoon as poſſible." He then retired to Ardea; and the Romans impoſed upon him a heavy fine. In the courſe of the Gallic war, a party of the Gauls, which had been ravaging the country, whilſt Brennus their general was beſieging Rome, was led by chance towards the city of Ardea. Camillus, as ſoon as he heard of their approach, rouzed the inhabitants to arm in their own defence. His efforts were not ineffectual; under his conduct they marched out to meet the enemy; and falling on them at night, when they had abandoned themſelves to intemperance and diſorder, a great ſlaughter enſued; the whole body of them was diſperſed, and moſt of thoſe who eſcaped were killed by the inhabitants of the country of Antium, whither they had fled. The fame of this victory ſoon ſpread through the neighbouring cities; and the Roman fugitives at Veii were encouraged to rally, and intreated Camillus to take them under his command. With this requeſt he delayed complying, from a regard to the laws of his country, till the citizens in the capitol had confirmed their choice. But as the city was inveſted by the Gauls, it was difficult to gain acceſs to this fortreſs. An intrepid youth, however, undertook the charge, and upon his arrival in the capitol, the ſenate was aſſembled; and he returned as ſpeedily as poſſible with a revocation of the decree by which Camillus had been condemned, and an unanimous nomination of him to the office of dictator. Camillus, thus reinveſted with authority, invited the diſperſed Romans and their allies to his camp; and ſoon found himſelf at the head of 40,000 men. With this force he ſo haraſſed the Gauls, and by cutting off their ſupplies reduced them to ſuch a ſtate of famine and peſtilence, that they negotiated with the beſieged citizens in the capitol; and in the iſſue, the Romans conſented to purchaſe peace by a ſum of gold. Livy relates, that whilſt the gold was weighing, Camillus ſuddenly arrived at the city gates, and prohibiting the payment, the contract for which had not obtained his concurrence as chief magiſtrate, drove the Gauls from the city into their camp. "Carry back," ſays he to the Romans, "that gold into the capitol; and as for you, Gauls, retire with your weights and ſcales; it is with the ſword only that the Romans ought to redeem their country."

Livy adds, that Camillus purſued them in their retreat, and ſo completely deſtroyed them, that not one Gaul was left to carry home the news of their defeat. Polybius, and ſome other writers, aſſert, that the gold was actually paid, and that the Gauls marched back in ſafety with their booty. Camillus, however, was juſtly regarded as the deliverer of his country; and his ſoldiers, on entering the vacant city in triumph, hailed him as Romulus, the father of his country, and the ſecond founder of Rome. This event happened A.U. 365. B.C. 389. In conſequence of it Camillus purified the ground with the cuſtomary expiations, rebuilt the temples, and erected a new one to Aius Locutius. See AIUS *Loquens*. He was continued in his office of dictator for a whole year, contrary to the uſual cuſtom which limited its duration to ſix months; and by his counſel and influence a decree was paſſed for rebuilding the city, and the work was undertaken with great alacrity and ardour. In the year of Rome 366, a formidable confederacy was concerted againſt Rome by ſeveral neighbouring ſtates, and Camillus, with a view to the ſuppreſſion of it, was a third time appointed dictator. Having raiſed a large army for this purpoſe, he ſpeedily accompliſhed it; and returning to Rome in triumph a third time, he laid down his office. The ſpoils and the ſale of the priſoners yielded a large ſum of money, part of which was applied for defraying the charge of three gold vaſes, inſcribed with the name of Camillus, as a memorial of his exploits, and depoſited at the foot of Juno's ſtatue in the capitol.

In order to quell the commotions occaſioned by the ambition of Manlius, who on a former occaſion had ſaved the capitol from the Gauls, Camillus was a fifth time elected military tribune; and he preſided at the tribunal which condemned this brave, but dangerous citizen to death. His ſixth election to the military tribuneſhip, A.U. 374, was occaſioned by the union of the Volſci with the inhabitants of Præneſte againſt the republic; and though he was now advanced in years, and wiſhed to decline public ſervice, he took the command, and completely defeated them. In the year of Rome 387, Camillus was advanced to the office of dictator a fourth time, for the purpoſe of compromiſing the differences that ſubſiſted between the patricians and plebeians, and of maintaining the prerogative of the former. By his authority he prevented the tribunes from propoſing their new laws to the people; but apprehending the threatened conſequences of their reſentment, and adverting to ſome informality that had occurred in the mode of his appointment, he abdicated his office. The approach of an invading army of the Gauls induced the republic again to direct their views to him as their deliverer; ſo that in his 80th year, he was a fifth time appointed dictator, and he cheerfully conſented to ſacrifice the remains of his life to the welfare of his country. On the banks of the Anio he fell unexpectedly on the Gauls, and defeated them with great ſlaughter. Having received the ſurrender of the town of Velitræ, he returned to enjoy the honour of another well-merited triumph. The turbulent ſtate of the republic would not allow the reſignation of his authority. The popular party determined on reſtoring the conſular government; and the tribunes prepared for ſeizing the perſon of the aged dictator on his tribunal. During the tumult he retired to the capitol; and having implored the gods to appeaſe the conteſt, and to avert its fatal effects, he made a vow to erect a temple to Concord, as ſoon as the troubles terminated. The voice of the people prevailed; and it was agreed, in favour of the ſenate, that one of the conſuls ſhould be choſen out of their own body. In order to preſerve the ſuperiority of the patricians, Camillus propoſed to ſeparate the judicial from the arbitrary power in the conſuls, by the appointment of a prætor, who ſhould be elected from the higher order of citizens, and adminiſter juſtice at home. The power of that party was farther augmented by the inſtitution of two curule or patrician ædiles. Camillus, having thus honourably cloſed his fifth dictatorſhip, and erected the temple of Concord, retired from public life; but in the year of Rome 389, B.C. 365, he fell a ſacrifice to a peſtilence that ſwept away a great number of citizens and magiſtrates.

"His memory was ever cheriſhed as one of the greateſt, moſt fortunate, and moſt patriotic chiefs of the Roman republic." It was a proverbial ſaying, much to his honour, that "wherever Camillus was, there was Rome." Thus expreſſed by Lucan in his Pharſalia, lib. v. v. 27.—

> "Vejoſque habitante Camillo,
> Illic Roma fuit"——

Pliny. Plutarch. Rollin's Rom. Hiſt. vol. ii.

CAMILLUS, in *Entomology*, an elegant ſpecies of PAPILIO, (Eq. Achiv.) deſcribed by Fabricius from a ſpecimen in the Bankſian Cabinet. The wings are white, with fulvous bands edged with black: on the poſterior ones a black caudal ſpot. This is of a ſmall ſize, and inhabits the interior of Africa.

CAMINA, in *Ancient Geography*, an iſland of the Mediterranean Sea, on the coaſt of Aſia Minor, near Miletus, and 38 miles from Platæa. Pliny.

CAMINHA, in *Geography*, a town of Portugal, in the province of Entre Duero e Minho, ſeated at the mouth of the Minho, and defended by a fort and garriſon; it contains about 1300 inhabitants, one pariſh-church, two hoſpitals, and two convents; 11 miles N.N.W. of Viana. N. lat. 41° 44′. W. long. 9° 15′.

CAMINI, or *yerva* CAMINI, in *Botany*, an American herb, the ſame with what is otherwiſe called PARAGUAY, or *yerva conpallo*.

CAMINSTIQUIA, in *Geography*, a river of Upper Canada, which diſcharges itſelf into the lake Superior, 30 miles E. of the Grand Portage.

CAMINITZA, a town of European Turkey, in the Morea, ſituate on a ſmall gulf at the mouth of a river of the ſame name, anciently called Olenus, and the river Mela; 24 miles N.E. of Chiarenza.

CAMINOS, in *Ancient Geography*, a place of Africa, in Cyrenaica, upon the route from the Greater Leptis to Alexandria. Anton. Itin.

CAMION, in the *Military Art*, a ſort of ſmall tumbril, or cart with three wheels, which is commonly drawn by two men, and anſwers for carrying bullets, &c. It is very convenient for magazines in cities and fortreſſes. This name is alſo given to a cart with three wheels, from eight to nine feet long in the body, for moving earth with horſes.

CAMIRIUM, in *Botany*. (Rumph. amb. 2. p. 180. tab. 58. Gært. vol. ii. 710. tab. 125. fig. 2.) See ALEURITES.

CAMIRO, anciently CAMIRUS, in *Ancient Geography*, a town in the iſland of Rhodes, ſeated on the W. coaſt, 18 miles S.W. of it, and almoſt oppoſite to Lindus. This was formerly one of the three cities called *Tripolis*: the other two were denominated *Lindus* and *Jaliſſus*. Of this town there remains no traces beſides the name of Camiro, a Greek village, built upon the ſame ſpot.

CAMIS, or KAMIS, in the *Japaneſe Theology*, denote deified ſouls of ancient heroes, who are ſuppoſed ſtill to intereſt themſelves in the welfare of the people over whom they anciently commanded. The camis anſwer to the heroes in the ancient Greek and Roman theology, and are venerated like the ſaints in the modern Romiſh church. Beſide the heroes or camis beatified by the conſent of antiquity, the *mikaddos*, or pontiffs, have deified many others, and continue ſtill to grant the apotheoſis to new worthies; ſo that they ſwarm with camis: the principal one is *Tenſio Dai Sin*, the common father of Japan, to whom are paid devotions and pilgrimages extraordinary.

CAMISA, Porto, in *Geography*. See Lisa.

CAMISADE, in the *Military Art*, a term denoting a ſudden or unexpected attack in the night, and for which a common badge, mark, or ſignal, is agreed on to enable the troops employed in making it to know one another by, particularly in the dark. A white ſhirt or chemiſe, ſtill called camiſe in ſome of the provinces of France, as moſt diſcernible, was commonly made uſe of, from which circumſtance the word took its riſe.

CAMISANO, in *Geography*, a town of Italy, in the Vicentin, belonging to the ſtate of Venice: 7 miles S.E. of Vicenza.

CAMISARDS, or Camisars, an appellation given by the French to the Calviniſts of the Cevennes, who formed a league, and took up arms in their own defence, in the year 1688. In their boldneſs, crimes, and enthuſiaſm they reſembled the Circumcelliones of Africa. The etymology of the name is diſputed; but it is moſt probably formed from camiſade. See Camisade.

CAMISENE, in *Ancient Geography*, a province of Aſia, in Armenia; which had a famous fortreſs, deſtroyed before the time of Strabo. Antonine mentions a village or town of this name upon the route from Nicopolis to Arabiſus. In the Table of Peutinger it is called Comaſſa, and placed 23 miles from Sebaſtia.

CAMISOLE, in *Conchology*, the name given by Argenville to the Linnæan *Trochus Pharaonis*.

CAMITA, or Comita, *iſland*, in *Geography*, lies 3 leagues N.E. from Cape Roſa, near the N.W. part of the peninſula of St. Domingo iſland.

CAMLET. See Camblet.

CAMLETINE, a ſlight ſtuff, formerly made of hair and coarſe ſilk, and reſembling camblet; but now out of faſhion.

CAMLIN, in *Geography*, a river of Ireland, in the county of Longford, on which the town of Longford is ſeated, and which falls into the Shannon.

CAMMA, and Gobbi, two provinces of Africa, in the kingdom of Loango, lying between the province of Sette and the cape of Lobo Gonzales; whoſe inhabitants are at perpetual war with each other, and whoſe country is interſected with lakes and rivers, that afford plenty of fiſh, but are infeſted with ſea-horſes, which are very miſchievous both on land and water, particularly to the canoes and other veſſels, which are continually plying to and fro upon the rivers and marſhes. The language, manners, and cuſtoms of both theſe provinces are almoſt the ſame with thoſe of Loango. They both allow of polygamy, and they are very free in the diſpoſal of their wives for the accommodation of their friends or ſtrangers. Their military weapons are the ſhort pike, bow and arrows, ſword and dagger; and the Europeans have furniſhed them with fire-arms, gun-powder and ball, beſide braſs pots and kettles for domeſtic uſe, and ſeveral ſorts of coarſe cloths. The chief town of Gobbi lies about a day's journey from the ſea. The land breeds little elſe but beaſts of prey. The principal commerce with the natives, beſide the logwood, conſiſts chiefly in elephants' teeth and tails, the hair of which is highly valued, and uſed for ſeveral curious purpoſes.

Camma, a river of Africa, which ſeparates the kingdom of Benin from Loango, and runs into the Atlantic. S. lat. 1° 40′. E. long. 11° 40′.

CAMMANIA, in *Ancient Geography*, a country of Greece, which formed a part of Theſprotia. It is the Ceſtrine of Pauſanias, and was called Ceſtrinia, according to Steph. Byz.

CAMMAS Water, in *Geography*, lies at the mouth of the river running from Morpeth, in Northumberland, and has a ſmall port for ſhipping, corn, and grinding ſtones.

CAMMIN, a town of Germany, in Pruſſian Pomerania, ſeated near the mouth of the Oder, on the lake of Boden, about 3 miles from the Baltic, near the ſee of a biſhop, ſuppreſſed by the peace of Weſtphalia, and united to the dominions of Pruſſia; 35 miles N.E. of Stettin. N. lat. 53° 56′. E. long. 14° 48′.

Cammin *ſound*, is one of the ſmall channels that lead from the Baltic into the channel of the river Oder, up to Stettin.

CAMMOCK, in *Botany*. See Ononis *ſpinoſa*.

CAMMONI, in *Ancient Geography*, a village placed on the Erythræan ſea, in the gulf of Barygaza, according to the periplus of Arrian; and probably the ſame with the *Camane* of Ptolemy.

CAMMOROS, in *Botany*, a name given by ſome of the old writers to a poiſonous plant called by the Romans *cicuta*, or hemlock; ſo that it became hence a name for the mandrake, and ſome of the nightſhades, with ſome authors. Many of the moderns, and even ſome among the ancients, have erred greatly in confounding the *cammoros* with the *cammaros*, which is an inſect, in figure reſembling the root of this aconite. See Comocladia.

CAMOCLADIA. See Comocladia.

CAMŒNA, in *Entomology*, an African Papilio, of the *Heleconii* tribe, deſcribed by Fabricius, the wings of which are ſomewhat entire, fuſcous, and dotted with black, with a red band on the poſterior pair.

CAMŒNÆ, in *Ancient Mythology*, a name given to the Muſes, becauſe it was their principal occupation to celebrate in ſong the actions of the gods and heroes. The camœnæ of Latium, mentioned by Plutarch in Numa, who were ſuppoſed to have ſhewn the ſacred fountain to the Veſtals, were probably, ſays Bryant (Anal. Anc. Mythol. v. i. p. 64.), the original prieſteſſes, whoſe buſineſs it was to fetch water for luſtrations from that ſtream. For Cam-Ain (he ſays) is the fountain of the Sun, and the camœnæ were named from their attendance upon that deity. The hymns in the temples of this god were ſung by theſe women; and hence the camœnæ were made preſidents of muſic.

CAMŒNARUM Lucus, in *Ancient Geography*, the name of a wood in the vicinity of Rome, at the Capena gate, in the midſt of which was the fountain of Egeria, conſecrated by Numa. Livy, l. i. c. 21.

CAMOENS, Lewis de, in *Biography*, a Portugueſe poet, was deſcended of an ancient family of Galicia, in Spain, under the name Caamans, but changed to Camoens, in 1370, when a branch of the family left Spain and attached itſelf to the king of Portugal. Camoens, the poet, ſprung from a younger branch of this family, which had been unfortunate; his father having ſuffered ſhipwreck at Goa, with the loſs of his whole property; and was born, as ſome ſay, in 1517, or according to others, in 1526 or 1527; nor is the place of his birth leſs conteſted than the time of it. Some ſay, that he was born at Coimbra, and others, at Santaren; but Emanuel de Correa, his intimate friend and companion, ſays, that he was born at Liſbon, and that his mother, Anne de Maudo, was of a noble family. He ſtudied in the Univerſity of Coimbra, where he was diſtinguiſhed by his application to the claſſics and to the philoſophy of the times; but his genius principally inclined him to poetry, and, therefore, upon his return to Liſbon, he became known at court by his poetical talents and his gallantry. Being no leſs agreeable in his perſon than in his converſation and writings, he was betrayed into imprudences of a licentious kind, which cauſed him to be exiled, as it has been generally thought, to Santaren in Eſtremadura, the place of his mother's nativity, and the reſidence of ſome of his relations. On this occaſion he compared himſelf, in one of his elegies, to the baniſhed Ovid. Diſguſted with an inactive life, and being naturally brave, he obtained permiſſion to ſerve in a fleet that was ſent to the ſuccour of Ceuta, in Africa, and in a naval engagement he had the misfortune to loſe one of his eyes. His ſtay at Liſbon, whither he returned after this naval expedition, was of ſhort continuance; ſome new cauſe of diſſatiſfaction aroſe, and he was again obliged to leave it; and, therefore, with complaints of the ingratitude of his country, he reſolved to embark for the Eaſt Indies in a fleet commanded by Cabral, which ſailed in 1553. At Goa he volunteered his ſervices in an expedition to the coaſt of Malabar; and after his return, in 1555, he embarked on a ſecond expedition to the Straits of Mecca, in the Red Sea, where, military exertion not being neceſſary, he employed his time in writing, and in viſiting ſome of the adjacent parts of Africa, which he has beautifully deſcribed. Having ſpent the winter at Ormuz, he returned to Goa; but indulging his diſpoſition in compoſing ſome ſatirical pieces againſt Bareto, the Portugueſe viceroy of India, and ſeveral other principal perſons of Goa, he was baniſhed by order of the viceroy to Macao in China. Here he obtained the profitable office of commiſſary of the eſtates of the deceaſed, and in the exerciſe of it acquired ſome property. During a reſidence of five years at Macao, he finiſhed his "Luſiad," which he had begun ſome years before in Portugal. Upon the removal of Bareto, he determined to return to Goa, and having freighted a ſhip for this purpoſe, he was unfortunately ſhipwrecked at the mouth of the river Meco, on the coaſt of Camboja, and loſt his whole property; however, he ſaved his life, and his poems, which he bore through the waves in one hand, whilſt he ſwam aſhore with the other. The natives treated him with hoſpitality; and on this remote coaſt he wrote his beautiful paraphraſe on the 137th Pſalm, which repreſents the Jews as hanging their harps on the willows by the rivers of Babylon. Upon his arrival at Goa, he was kindly received by Don Conſtantine de Braganza, the new governor; but his ſucceſſor, count Redondo, conceiving prejudices againſt him, on account of ſome malverſation in his office at Macao, with which he was charged by his enemies, threw him into priſon. Having cleared himſelf of the charge alleged againſt him, he was detained for debt; and it was in conſequence of an humorous petition, which he preſented to the viceroy, that he obtained his liberty. His next adventure was that of accompanying the governor of Soſala to that ſettlement; but he was deceived by promiſes which were never fulfilled, and treated with ſingular ſeverity. When the governor found that Camoens was determined to leave him, he endeavoured to detain him by making a charge of debt for his board, and threatening to confine him in priſon. Theſe unreaſonable claims were ſatisfied by ſome Portugueſe gentlemen, who invited him to accompany them to Europe; and accordingly he arrived with them in Liſbon in 1569, after an abſence of 16 years. One principal object, which made him deſirous of reviſiting his native country, was the publication of his "Luſiad," which appeared in 1572. This poem, which came to a ſecond edition in the ſame year, was dedicated to king Sebaſtian, who, it is ſaid, allowed him a ſmall penſion of 4000 reals, on condition of his living at court. With this pittance, if it had been continued, Camoens would have lived in peace and comfort; but Sebaſtian ſoon loſt his life in Africa, and upon the acceſſion of Henry, the poet was forgotten, and his penſion was withheld. Thus reduced to a ſtate of deplorable indigence and diſtreſs, a poet, who had produced what at its firſt appearance was thought to do honour to the nation, ſpent the reſidue of his life, humbled and mortified amongſt a few Dominican monks, either in an alms-houſe, or under the charitable roof of a nunnery. It is ſaid, that his black ſervant, a native of Java, who had been his companion for many years, and who aſſiſted in ſaving his life when he was ſhipwrecked, begged in the ſtreets of Liſbon for the ſupport of his maſter, who died in 1579. It is ſaid, that his death was accelerated by the anguiſh with which he foreſaw the ruin impending over his country. In one of his letters he uſes theſe remarkable expreſſions: "I am ending the courſe of my life; the world will witneſs how I have loved my country. I have returned not only to die in her boſom, but to die with her." He was buried as obſcurely as he had cloſed his life, in St. Anne's church; and the following epitaph was inſcribed over his grave:—

"Here lies Lewis de Camoens,
Prince of the poets of his time.
He lived poor and miſerable, and died ſuch,
Anno Domini, 1579."

Some years afterwards a reſpectable monument was erected over his remains, at the expence of a Portugueſe nobleman. "His memory was honoured by numerous eulogies from the poets of Spain and Portugal, and the name of Camoens is ſtill pronounced with enthuſiaſtic veneration by all the votaries of Portugueſe literature." Of the various poetical compoſitions, written by Camoens, the epic poem, entitled "Luſiad," is the only one which makes him known in modern times. The ſubject of this poem is the diſcovery of the Eaſt Indies by the Portugueſe, under Vaſco de Gama; and the fleet is conducted by the poet round the coaſt of Africa to Calicut, on the Malabar coaſt. In the courſe of the voyage the author introduces a great variety of deſcriptions, which his knowledge of the parts of the world to which they relate renders noble and intereſting. Some of his poetical fictions are conceived with true genius; and the giant Adamaſtor, the guardian of the Cape of Tempeſts (ſince called the Cape of Good Hope,) is a creature of fancy as ſublime as the imagination of a poet has produced. "On the whole," ſays Dr. Aikin (Gen. Biog.), the want of a well-connected plan, the neglect of proper decorum, the monſtrous mixture of the Heathen with the Chriſtian mythology, and the general baldneſs and want of elevation in the ſtyle, place this work far beneath the principal epics of ancient and modern times." "The whole work," ſays Dr. Blair (Lectures on Rhetoric, &c. vol. iii. p. 273.), "is conducted according to the epic plan. Both the ſubject and the incidents are magnificent; and, joined with ſome wildneſs and irregularity, there appear in the execution much poetic ſpirit, ſtrong fancy, and bold deſcription." "There is no attempt towards painting characters in the poem; Vaſco is the hero, and the only perſonage indeed that makes any figure. The machinery of the Luſiad is perfectly extravagant; not only is it formed of a ſingular mixture of Chriſtian ideas, and Pagan mythology; but it is ſo conducted, that the Pagan gods appear to be the true Deities, and Chriſt and the Bleſſed Virgin to be ſubordinate agents. One great ſcope of the Portugueſe expedition, our author informs us, is to propagate the Chriſtian faith, and to extirpate Mahometaniſm. In this religious undertaking, the great protector of the Portugueſe is Venus, and their great adverſary is Bacchus, whoſe diſpleaſure is excited, by Vaſco's attempting to rival his fame in the Indies. Councils of the gods are held, in which Jupiter is introduced, as foretelling the downfal of Mahometaniſm, and the propagation of the Goſpel. Vaſco, in great diſtreſs from a ſtorm, prays moſt ſeriouſly to God; implores the aid of Chriſt and the Virgin, and begs for ſuch aſſiſtance as was given to the Iſraelites, when they were paſſing through the Red Sea, and to the Apoſtle Paul, when he was in hazard of ſhipwreck. In return to this prayer, Venus appears, who diſcerning the ſtorm to be the work of Bacchus, complains to Jupiter, and procures the winds to be calmed. Such ſtrange and prepoſterous machinery ſhows, how much authors have been miſled by the abſurd opinion, that there could be no epic poetry without the gods of Homer. Towards the end of the work, indeed, the author gives us an awkward ſalvo for his whole mythology; making the goddeſs Thetis inform Vaſco, that ſhe, and the reſt of the Heathen deities, are no more than names to deſcribe the operations of Providence."

"There is, however, ſome fine machinery, of a different kind, in the Luſiad. The genius of the river Ganges, appearing to Emanuel king of Portugal, in a dream, inviting that prince to diſcover his ſecret ſprings, and acquainting him, that he was the deſtined monarch for whom the treaſures of the Eaſt were reſerved, is a happy idea. But the nobleſt conception of this ſort, is in the fifth canto, where Vaſco is recounting to the king of Melinda, all the wonders which he met with in his navigation. He tells him, that when the fleet arrived at the Cape of Good Hope, which never before had been doubled by any navigator, there appeared to them on a ſudden, a huge and monſtrous phantom riſing out of the ſea, in the midſt of tempeſts and thunders, with a head that reached the clouds, and a countenance that filled them with terror. This was the genius, or guardian, of that hitherto unknown ocean. It ſpoke to them with a voice like thunder; menaced them for invading thoſe ſeas which he had ſo long poſſeſſed undiſturbed; and for daring to explore thoſe ſecrets of the deep, which never had been revealed to the eye of mortals; required them to proceed no farther; if they ſhould proceed, foretold all the ſucceſſive calamities that were to befal them; and then, with a mighty noiſe diſappeared. This is one of the moſt ſolemn and ſtriking pieces of machinery that ever was employed; and is ſufficient to ſhow that Camoens is a poet, though of an irregular, yet of a bold and a lofty imagination."

This poem has been tranſlated into many languages, and illuſtrated by elaborate commentaries. Two Engliſh verſions of it have appeared; one by ſir Richard Fanſhaw, in the 17th century; and another in the latter part of the 18th by William Julius Mickle, A. D. 1776, 4to. "This laſt," ſays Aikin, "is one of the beſt verſified poems in the Engliſh language; but the liberties taken with the original, in large additions, alterations, and omiſſions, beſides a perpetual ſuperiority of poetic language, render it a very flattering repreſentation of the poem of Camoens." Gen. Dict. Introd. to Mickle's Luſiad.

Camoens's *Cave*, in *Geography*, a cave below the loftieſt eminence in the town of Macao in China, ſo called from a tradition current in the ſettlement, that the Portugueſe poet of that name wrote his celebrated poem of Luſiad on that ſpot. This intereſting cave is in the middle of a garden, which commands a very extenſive proſpect.

CAMOGLI, a town of Italy, in the ſtate of Genoa, near the ſea-coaſt; 13 miles E. of Genoa.

CAMOIL, a town of France, in the department of Morbihan, and diſtrict of Vannes, 1½ league W.S.W. of Roche-Bernard.

CAMOMILE, in *Botany*. See Anthemis.

CAMOO, in *Geography*, a town of Japan, in the province of Oomi.

CAMORA. See Zamora.

CAMORTA, a ſmall iſland in the bay of Bengal. N. lat. 8° 8′. E. long. 94° 3′.

CAMOTES, a group of iſlands belonging to the Philippines in the Eaſt Indian ocean, ſituate between Zebu or Cebu, and the coaſt of Ogmuah and Leyte; the chief of which is Poro, dependent on Zebu.

CAMOUCLE, in *Ornithology*, the horned ſcreamer, according to Bajon. See Palamedea *cornuta*.

CAMOUFLET, a ſmoky paper held under the noſe of one that ſleeps. But when this word is made uſe of as a term of war, it ſignifies an affront, a mortification, a diſappointment. An enemy's miner is ſaid to give a camouflet to ours, when he finds means to deſcend or get down into his adverſary's gallery, to make ſome ſmall mines blow up, and thereby to ſtifle or ſuffocate him.

CAMP, in *Geography*, a town of Germany, in the circle of the Lower Rhine, and archbiſhopric of Treves, on the eaſt ſide of the Rhine, oppoſite to Boppart.

Camp, in the *Military Art*, the ground where a corps, body of troops, or army, pitch their tents, and live or dwell in the ſame, either for a ſhorter or longer ſpace of time. In a more general acceptation of the word, it may be defined to be the ſpot or ground where any number of perſons, however ſmall, ſtop or remain in tents, wigwams, huts, or otherwiſe, for one night or a longer time, whether they be in a ſtate of warfare, or engaged in their ordinary purſuits of life. Thus, for inſtance, the ſavages or wandering natives of America are ſaid to encamp; and the ſpots where they have their wigwams, or remain even for one night or two, are called their camps or encampments. Many of them are in as ſimple and uncultivated a ſtate of life as it is poſſible for human creatures to be in. For men neither ever did nor ever can exiſt but in a ſtate of ſociety of ſome kind or other. Ever ſince there have been men, however, there have been diſputes or quarrels. Theſe led to violence and warfare, and obliged thoſe who lived even in the ſimpleſt and rudeſt ſtate of ſociety, to think of and contrive means for ſecuring their encampments againſt ſurpriſe or inſult. For this purpoſe they would naturally make uſe of ſtakes, buſhes, an abatis, a ditch, and occupy ſituations difficult of acceſs, and advantageous in other reſpects. The firſt contrivances and efforts of genius, however, in the way of defence muſt have been rude, defective, and of little moment, ſuited to the ſimplicity of thoſe by whom they were made, who poſſeſſed neither the experience that could lead to the conception of great deſigns, nor the means neceſſary for executing them. Ditches, bordered with bruſh, buſhes, an abatis, or a ſingle row of ſtakes, ſurrounded their huts, tents, or cabins, and formed their whole ſecurity. The Indians in America furniſh, at this moment, many examples of this manner of fortifying. As men advanced in ſocial improvements, and began to have fixed or permanent habitations, they would naturally think of conſtructing walls with wood, earth, and afterwards with ſtones. Julius Cæſar in his time found wooden walls in uſe among the Gauls; and there are ſome parts now in Ruſſia, where the towns are defended or ſecured by walls of wood or timber.

The words made uſe of by the Grecian writers to expreſs a camp, or the camp, are always in the ſingular number, as τὸ ϛρατόπεδον, ἡ παρεμβολή. But the Roman military writers conſtantly uſe the word *caſtra*, in the plural number, to ſignify a camp, or the camp. Some have attempted to derive the word *caſtra* from *caſtro*, making it of the ſame import as *caſtu*, quod ibi caſtraretur libido, and becauſe the Roman ſoldiers were not originally permitted to marry. But the word caſtra is the plural of caſtrum, which Cicero has made uſe of: and caſtrum or caſtra is eaſily and evidently derivable from caſas aſtruere, to erect or build huts or tents adjoining to one another or cloſe together. But no good or even plauſible explanation has been given of the cauſe or reaſon why the Roman hiſtorians invariably employ the word *caſtra* in the plural number, and not *caſtrum* in the ſingular, not only when they mention both the conſular camps when ſeparate, but alſo when they ſpeak only of one of them or of both joined together as one. The following circumſtance, however, probably gave riſe to that practice, or cuſtomary mode of expreſſion, for a camp or the camp. The tribes originally when they went out encamped ſeparately and apart from one another, each by itſelf. The different poſitions or ſpots of ground they occupied, were naturally called the camps, or caſtra; which term or expreſſion growing into uſe was retained when they were encamped together and ſurrounded by one and the ſame ditch and rampart.

It is not probable that either the Romans or any other people originally encloſed their camps on every occaſion with regular ditches and ramparts, but rather that they frequently choſe ſtrong and advantageous ſituations, and depended on watchfulneſs and valour for their ſecurity. It was a very ancient cuſtom, however, among the Greeks, to ſurround their places of encampment occaſionally with a ditch or trench, which they called ὄρυγμα. Homer ſpeaks of the camp which they formed before Troy, and makes them poſt the beſt and braveſt of their troops on the two flanks or wings. The Lacedæmonians, who were trained up in martial exerciſes from the time they were ſeven years of age, and ſtudied war as an art or ſcience more than any other of the ſtates of Greece, were not only well acquainted with the genuine maxims and principles of warfare, but alſo ſkilful, dexterous, and expert in all the methods of carrying them into practice long before the Macedonians, the Carthaginians, and the Romans. They alſo received from their celebrated lawgiver, Lycurgus, the firſt mixed form of government compoſed of the three ſimple ones, viz. monarchy, ariſtocracy, and democracy, that exiſted in Europe. It laſted for many ages; and whilſt they adhered to his laws and inſtitutions, they were alike free from internal diſſenſions among themſelves, and proof againſt ſubjugation by external force. The Macedonians borrowed from them the beſt part of their military regulations and diſcipline. The Carthaginians imitated them, and on one occaſion a certain Lacedæmonian, named Xantippus, who joined them with a body of mercenaries from Greece, by his ſuperior ſkill in the art of war, and dexterous management, defeated the Roman conſul Regulus, who till then had been uniformly victorious over them, and ſaved their ſtate when it was brought to the very brink of deſtruction. The Romans, at an early period, not only adopted ſeveral of their military maxims, precepts, and inſtitutions, but alſo committed them to writing, carefully keeping records of them, and retained them ever after. It has been ſaid, on the authority of ſome writers, that their camp was of a circular form, which was preſcribed by Lycurgus, as fitter for defence than any other. This reaſon, however, aſcribed to that great lawgiver, is not a good or juſt one. For a direct defence from a ſtraight line is much better than from the convexity either of a circle or ellipſe. Beſides this, the obſervation militates againſt facts, and the practice of the Lacedæmonians themſelves in the different wars in which they were engaged. For, like the reſt of the Greeks, they did not obſerve any invariable form or method in their encampments, but chiefly conſulted the nature and ſtrength of the ground they encamped on, and gave to their camp the form and arrangement that beſt ſuited the ſame, employing, on different occaſions, every ſort of figure which the poſitions they occupied required. This erroneous idea, in regard to the figure of the Spartan camp, was probably derived from the circumſtance, that the city of Sparta itſelf was of a circular form. It is not very probable, however, that the Spartans often intrenched their camps, as they did not even ſecure their city with a wall, or rampart, depending on their own vigilance and valour, more than on walls, for its protection. That they ſometimes did, however, cannot be denied. For Cleomenes, when oppoſed to Antigonus, not only occupied ſtrong poſitions, but alſo made uſe of intrenchments, and even abatis. Many other inſtances might likewiſe be mentioned. We know, indeed, from the beſt authority, that the Greeks in general accommodated the figures and diſtributions of their camps to the ſituations they encamped on, ſometimes ſecuring them with trenches and ramparts, but often not. They occaſionally ſuffered ſeverely by neglecting this precaution, of which the Meſſenians furniſh a ſtriking example, when they marched with their forces to join Philip of Macedon, though they encamped cloſe under the walls of a friendly fortreſs. Polybius, in the ſixth book of his general hiſtory, in ſpeaking of the great regularity of a Roman camp, the rules the Romans regularly obſerved in forming it, their invariable cuſtom of ſurrounding it with a ditch and rampart, and the great eaſe and facility with which theſe were made, by each ſoldier's knowing always on what part he was to perform his labour, as well as his own place in the camp, and that of the body he belonged to, contraſts their practice with that of the Greeks; and tells us, that theſe, when they encamped, chiefly conſidered the natural ſtrength of the place they fixed on, and accommodated to it the arrangement and diſpoſition of their encampment, wiſhing partly to avoid the labour of making intrenchments, and partly perſuaded that works raiſed by art are ſeldom ſo ſtrong or ſecure as thoſe that are formed by nature. He ſays, that in compliance, therefore, with what the ſituations demanded, they were not only obliged to give every ſort of figure to their camps, but alſo to vary the poſition of the ſeveral parts of them, as the place for each was favourable or improper; and that from thence it happened that the ſoldier never knew to a certainty his own place in the camp, or that of the body to which he belonged. But the Romans, he informs us, willingly ſubmitted to the taſk of making intrenchments, and to other toilſome labour, for the ſake of the great advantage that was found to ariſe from their employing a method that was never changed, and which rendered all the parts of the camp quite familiar to the army. The Macedonians, who learnt the art of war from the Greeks, and particularly from the Spartans, like them gave their camp every ſort of figure to make it ſuit the ground they encamped on, ſometimes intrenching it, and ſometimes not, as circumſtances ſeemed to require.

Even before Alexander the Great invaded Perſia, the Grecian coloniſts in Aſia and the nations in it who were in the practice of employing Greeks in their armies, encamped nearly in the ſame way, varying the forms of their encampments with thoſe of the poſitions they occupied with them, ſecuring them with intrenchments on ſome occaſions, and on others not. But after the death of that prince, who ſeemed to have been born for the conqueſt of men, both the Egyptians and all thoſe nations of Aſia that had been viſited by his arms, followed very nearly the Macedonian or Grecian method of encamping, and generally when at no great diſtance from their enemies, or in danger of being attacked, ſtrengthened and ſecured their camps with ditches and ramparts. Thus the camp of Molon, who was governor of Media, and had revolted againſt Antiochus, the ſon of Seleucus, was intrenched on the bank of the Tigris. Theodotus the Ætolian, governor of Cœlo-Syria, ſecured the troops he had poſted in the narrow part of the vale of Marſyas, between the fortreſſes of Brenchi and Gerrha, ſo well with intrenchments and paliſades, that the ſaid Antiochus in trying to penetrate that way, ſuſtained ſo great a loſs, that he was obliged to deſiſt from the attempt. Both this king and Ptolemy Philopater, in their conteſt for the ſovereignty of that province, intrenched their camps. And many other inſtances of this practice, ſubſequent to the time of Alexander, might be given.

The Carthaginians, who had an intercourſe with the Greeks, long before their obſtinate contention with the Romans in Sicily for the poſſeſſion of that iſland, followed a ſimilar mode of encamping, changing, like them, the forms of their camps, to make them ſuit the ſituations they occupied, ſurrounding them ſometimes with ditches and ramparts, and ſometimes not, as circumſtances made ſuch precautions neceſſary or otherwiſe. It is probable they paid more attention than formerly both to the ſecurity of their camps, and to regularity in forming them after they came to be engaged in long and obſtinate conteſts with the Romans. It does not appear, however, that the Carthaginian generals, when they ſat down, contrary both to common ſenſe and the rules of military ſcience, with their elephants and cavalry, as well as their infantry, on a rough and craggy eminence near Adis, which Regulus was beſieging, took meaſures for ſtrengthening their camp with any works whatſoever. But it is evident that the camp of Xantippus, who ſoon afterwards defeated Regulus, and deſtroyed his army, was intrenched as well as that of the Romans. There never perhaps exiſted a general who was more capable than Amilcar Barcas, of chooſing proper and advantageous ground for encampments, or who knew better how to ſecure and defend them. His ſon Annibal, who, though he often ſurpriſed his enemies, was himſelf never once ſurpriſed, always ſecured his camp ſo well with an intrenchment and paliſades, that during the ſixteen years he waged war againſt the Romans in Italy, though he never once diſmiſſed his army from the field, no ſerious attack was ever made on it but on one occaſion by Minucius, when moſt of his troops were out of it a-foraging. As he very judiciouſly adopted the arms and armour of the Romans for his heavy-armed infantry, after the firſt battle he fought with them, it is more than probable that he alſo followed their mode of encamping, in which they appear to have been as ſuperior to any other people among the ancients, as they were in their arms and order of battle. And as ſome part of their method is ſtill retained by all nations in Europe in encamping their troops, it may not be improper or unneceſſary to give a correct plan and deſcription of a Roman camp, and of the diſpoſition or arrangement of its different parts from Polybius, a faithful and judicious hiſtorian, and the only one among the ancients who has left us a diſtinct account thereof. Beſide his ſtrict adherence to truth in all his narratives, he was a perſon of great political and military talents, wrote at a period of time when the government of Rome was in its greateſt vigour, and poſſeſſed a thorough knowledge of all its component parts, cuſtoms, and inſtitutions. This is perhaps the more requiſite, as Juſtus Lipſius, who was a man of much learning, but of little military information, has led almoſt every modern writer wrong, that has treated either on the caſtrametation or order of battle of the Romans.

Though it is highly probable that from the very beginning they ſecured their camps more or leſs with intrenchments, and particularly from the time they began to carry on their operations at ſome diſtance from their own city, and the tribes came to encamp together on the ſame ſpot, or within one and the ſame incloſure, yet if we are to credit ſome hiſtorians, there was but little interior regularity or orderly arrangement of the different parts in them, before the 124th Olympiad, when Pyrrhus, king of Epirus, on the invitation, and in ſupport of the Tarentines, invaded Italy. That prince was certainly endowed both with military talents of an extraordinary nature, and with the moſt undaunted courage; fertile in ſtratagems and expedients, moſt ſkilful in every branch of diſcipline, and perfectly converſant in all parts of the art of war. He waged war with various ſtates, with moſt powerful kings, and great commanders, and generally was victorious without being ever, ſtrictly ſpeaking, vanquiſhed himſelf. In all his battles with the Romans he employed not only the arms but the troops of Italy, and placed, in alternate order, companies of them, and cohorts armed and drawn up after the manner of the phalanx. Even with this contrivance, however, though he rather worſted them in ſome engagements, he never was able to obtain any very clear or decided advantage over them; ſuch were the inherent excellence of their order of battle, and the advantageous nature of their arms and armour in cloſe combat. By their firmneſs and ſteady perſeverance, they at laſt forced him to quit Italy, and leave the Tarentines with the inhabitants of other cities, that had been confederated with him againſt them, to their fate. And getting poſſeſſion of one of his camps, they, from the interior arrangement of it, improved the diſpoſition of their own, and gradually brought their caſtrametation to perfection.

The Romans were the only people we have any account of, who invariably obſerved one mode or manner of encamping, and conſtantly intrenched themſelves wherever they encamped, if they halted only for a ſingle night.

The intrenchments, however, with which they ſurrounded their temporary or large camps in the field were not ſo ſtrong as thoſe which they made round their *caſtra ſtativa*, their forts or ſmaller camps, called *caſtella*, in which a few cohorts or ſmall garriſons were frequently left for ſome time to defend themſelves, without any other aid or aſſiſtance, and which were ſometimes encloſed with two, three, four, and even five or more diſtinct ditches and ramparts.

They had their *caſtra æſtiva*, and their *caſtra hiberna*. The firſt of theſe they occupied in ſummer, when they were carrying on their operations in the field; and the laſt were either towns they took poſſeſſion of, or ſuch as they raiſed themſelves in proper ſituations, and fortified for the purpoſe of quartering their troops in during winter. Their *caſtra æſtiva* were likewiſe of two ſorts, namely, thoſe which they occupied from day to day, or for a ſhort time only, being temporary camps, and called ſimply *caſtra*, and thoſe they occupied for a conſiderable ſpace of time, and which are repeatedly called *caſtra ſtativa*. The former of theſe were more ſlightly intrenched than the latter.

"This, then," ſays Polybius, book vi. "is their (the Roman) kind of caſtrametation.

Ground being always choſen for the encampment, the general's tent occupies the part of it moſt convenient for proſpect and command. A ſtandard being placed where they are to fix it, a quadrangular place is ſo meaſured off round this ſtandard, that all the ſides may be one hundred feet diſtant from the ſtandard, and the area be four acres. See N° 1. in the plan of a Roman camp.

And always before one face and ſide of this figure, which appears the moſt commodious for ſupplies of water and forage, the Roman legions are placed in this manner: there being ſix tribunes, as has been already obſerved, in every legion, and two Roman legions always with each of the conſuls, it is evident, that twelve tribunes of neceſſity ſerve with each of the conſuls. They place, therefore, all their (the tribunes) tents along one right line, which is parallel to the ſide of the quadrangle that has been fixed on, and diſtant from it fifty feet. This place is for the horſes, with the beaſts of burthen, and the reſt of the equipage of the tribunes. See N° 2 in the plan.

Theſe tents being placed with their back parts towards the aforeſaid figure, are ranged fronting outwards towards the ſide, which ſhall always be noticed as, and called by us, on every occaſion, the front of the whole ſcheme. And the tents of the tribunes are equally diſtant from one another to extend along as much ſpace as the whole breadth always of the Roman legions. See N° 3.

The tents of the præfecti of the allies, in like manner, extended the whole breadth of their cavalry and infantry, and had the ſame width of fifty feet behind them for their horſes, beaſts of burthen, and baggage, that was left behind thoſe of the tribunes. See N° 4 and 5, in the plan.

Again, one hundred feet being meaſured off forwards, in front of all theſe tents, they then from the right line, limiting this breadth, which is parallel to the tents of the tribunes, begin to make the camps of the legions, uſing this method. See N° 6.

Having biſected the aforeſaid right line, by a line drawn at right angles to it from this ſtandard, they encamp the horſe of each legion oppoſite to, and fifty feet diſtant from each other, dividing this diſtance in the middle by a line. The arrangement of the tents, both for the horſe and foot, is alike; for the whole figure, both of a maniple and of a troop, is quadrangular. This looks into the ſtreets, and has a determinate length along the ſtreet; for it is one hundred feet. And, in general, they endeavour to give it an equal depth, except for the allies. And when they make uſe of fuller legions, they add both to the length and depth in proportion. See N° 7 and 8.

This encampment then being made of the horſe oppoſite to the middle tents of the tribunes, like a certain ſtreet croſſing the aforeſaid right line, and the place before the tribunes; (for the figure of all the intervals, on each ſide, is, in truth, made like to ſtreets, along ſome of which the maniples, and ſome of them the troops of horſe are encamped); they place behind the ſaid horſe the triarii of both legions, a maniple againſt each troop in the ſame figure of equal length, the figures joining one another, but looking in contrary directions to the oppoſite fronts of the horſe, and make the depth of each of theſe maniples equal to half its length, as their number is always the half only of that of each of the other parts. Wherefore, though the numbers of the men often vary, it happens that all theſe parts are always equal in length by the variation of the depth. See N° 9.

Again, ſetting off fifty feet from each of theſe, they encamp the principes oppoſite to the triarii. And theſe looking towards the ſaid intervals, two other ſtreets are likewiſe formed. But, in the ſame manner as the cavalry, they take their beginnings and commencements from the ſame right line and interval of one hundred feet in front of the tribunes. And they terminate towards that ſide of the intrenchment oppoſite to the tribunes, which, from the firſt, we have ſuppoſed to be at the front of the whole figure. See N° 11.

Next to the principes, and behind them, they, in like manner, encamp the haſtati looking a contrary way, placing the figures cloſe together. And there being ten maniples in each of all the parts, (of a legion) according to the diviſion from the beginning, it happens, that all the ſtreets are equal both as to length, and as to their terminating evenly towards the ſide of the intrenchment at the front, turned towards which they encamp the laſt maniples. See N° 12.

Again, leaving fifty feet from the haſtati, they encamp oppoſite to them the horſe of the allies, beginning at the ſame right line *with them*, and ending at the ſame right line. But, as I have obſerved above, the number of the foot of the allies is equal to that of the Roman legions leſſened by that of the extraordinarii. And that of their horſe is double. A third part being taken from theſe for extraordinarii, by increaſing in proportion the depth of the figures, in which they encamp them, they endeavour to make them equal, as to length, the Roman legions. See N° 14.

All the five ſtreets being now completed, they again, increaſing the depth in due proportion, place the maniples of the allied foot ranging rear to rear to the horſe, and looking towards the intrenchment, and both fronts of its tranſverſe ſides. And in each maniple the centurions occupy the firſt tents on either ſide. See N° 15.

But in following the aforeſaid method of encamping, they ſeparate on each ſide the ſixth troop fifty feet from the fifth, and, in a ſimilar manner, the maniples of foot; ſo that this becomes another opening through the middle of the legions croſſing theſe ſtreets, and parallel to the tents of the tribunes, which they call the fifth, (or via quintana), from its extending along the fifth maniples. See N° 16.

But the place behind and back from the tents of the tribunes lying adjacent to each ſide of the general's ground, becomes one part of it a place for the forum, and the other for the quæſtor, and the things under his charge. See N° 17 and 18.

From the laſt tents of the tribunes, on either ſide, having an arrangement as it were inflected backwards perpendicularly to theſe tents, all the choice men of the extraordinary horſe, and ſome of thoſe ſerving as volunteers, from regard and reſpect to the conſuls, encamp according to (or parallel to) the faces of the intrenchment on the tranſverſe ſides, part of them fronting the ſtores of the quæſtorium, and part of them on the oppoſite ſide looking into the forum. And it for the moſt part happens to theſe not only to encamp near the conſuls, but alſo on marches, and on other neceſſary occaſions, to perform their whole duty and ſervice about the conſul and quæſtor. See N° 19.

And the foot performing a ſimilar ſervice with the forementioned horſe, are placed oppoſite to them, looking towards the intrenchment. See N° 20.

Then from theſe is left a ſtreet one hundred feet wide, and parallel to the tents of the tribunes extending along the oppoſite ſides of the forum, prætorium, and quæſtorium, to the above-mentioned parts of the intrenchment. See N° 21.

And along the upper ſide of this, the extraordinary horſe of the allies encamp, looking towards the forum together with the prætorium, (or general's ground), and the quæſtorium. See N° 22.

At the middle of the encampment of theſe horſe, and at the ſame ground adjoining the prætorium, a ſtreet of fifty feet is left reaching to the rear ſide of the encampment, its direction lying at right angles to the aforeſaid broad ſtreet. See N° 23.

With their backs to theſe horſe again, the extraordinary foot of the allies are placed looking towards the intrenchment and the rear-aſpect of the whole encampment. See N° 24.

And the vacant ſpace left on each ſide of theſe towards the tranſverſe ſides, is given to ſtrangers and allies occaſionally arriving. See N° 25.

All being thus diſpoſed, the whole figure of the encampment becomes an equilateral quadrangle. And as to what relates to the interſection of the ſtreets in it, and its diſtribution in other reſpects, it has an arrangement reſembling a city. They place the intrenchment on every ſide two hundred feet diſtant from the tents; and this vacant ſpace affords them many and great conveniencies. It is commodious and uſeful for the ingreſs and egreſs of the legions. For each of them move out into this open ſpace through their own ſtreets, but do not puſh down and trample on one another by crowding into one. Carrying alſo to this place the booty of cattle they bring in, and the ſpoils they take from the enemy, they keep them ſafe during the nights. But the greateſt is this, that in nocturnal aſſaults neither fire nor weapons, except a very few, can reach them. And it happens, that even theſe are almoſt harmleſs, from the greatneſs of the diſtance, and the ſurrounding tents."

Polybius, in this deſcription of a Roman camp, ſuppoſes a legion to conſiſt of four thouſand two hundred foot, and three hundred horſe. He obſerves, however, that, from it, thoſe who chooſe to examine it will eaſily be able to underſtand the extent and whole perimeter of a camp, even when the legion conſiſts of a greater or leſs number. When more of the allies than are uſual either accompanied them from the beginning of an expedition, or afterwards arrived in the camp, he informs us, that beſides aſſigning to the latter the places already mentioned, they filled with them, alſo, thoſe on each ſide of the prætorium, bringing the forum and quæſtorium together into one place, as the occaſion and neceſſity required; and that as to the former, when their number exceeded what was cuſtomary, beſides the locations uſually made for them, they laid out an additional ſtreet for them beyond the legions both on the right and left ſide of the camp.

But when the four legions and both conſuls were aſſembled together within one and the ſame intrenchment, he ſays, that nothing more is neceſſary for underſtanding their method of encamping than to ſuppoſe two armies diſpoſed of in the manner now deſcribed, with their rears where the extraordinaries as he has mentioned of each were placed, joined together. Whenever this happened, he tells us, the figure of the camp, inſtead of being a ſquare, became a rectangle, having its area double that of the conſular camp he has given a deſcription of, and its perimeter one half greater. This, indeed, is manifeſt, ſince two equal ſquares joined together form a rectangle, of which the area is double that of either, and the perimeter is to that of each of them, in the ratio of 6 to 4 or of 3 to 2. The Romans, he adds, always obſerved this method or diſpoſition as often as both conſuls had their camps joined together, and that as often as they had ſeparate and diſtinct camps, the arrangement continued the ſame, with this variation only, that they then placed the forum, quæſtorium, and prætorium, in the middle between both the armies.

Polybius, in deſcribing the Roman method of encamping, makes no mention of the *velites*, or light-armed troops, who, in every legion, were equal in number to the haſtati, or to the principes. But in giving an account of the compoſition of the legion, and the mode of forming it, he expreſsly affirms, that they were diſtributed equally, or in juſt proportion, among all the reſt, according to their number. It is, therefore, natural to ſuppoſe, that the ſame diſtribution of them exiſted in the camp, or that two-fifths of them encamped with the haſtati, two-fifths with the principes, and one-fifth with the triarii.

From what has been obſerved, then, it appears that the Romans in the time of Polybius, allowed ground for encamping on at the rate of $59\frac{11}{21}$ ſquare feet to every foot ſoldier, and $333\frac{1}{3}$, for every horſeman and trooper and his horſe. For as the haſtati and principes were equal in number in every legion, and the velites equal to each of them, and as each of the former conſiſted of ten companies, amounting, when the eſtabliſhment of the legion was at 4200 foot, to 1200, and had two fifths of this number, or 480 of the velites diſtributed among them, it is evident, that on every ſpot of ground 100 feet ſquare, occupied by a maniple either of haſtati or of the principes, there were encamped 120 of themſelves, and two fifths of this number, or 48 of the velites, in all 168 men. But a ſquare, of which the ſide is equal to 100 feet, contains 10,000 ſquare feet, which divided by 168, gives 59 ſquare feet, and eleven twenty-one parts of a ſquare foot. In like manner, as the number of the triarii was only equal to half that of either the haſtati or the principes, amounting to no more than 600 men, and as theſe were alſo divided into ten companies, and had one fifth part or 240 of the velites diſtributed among them, it is manifeſt, that on each of the ten rectangles, occupied by their maniples, there were encamped 60 of themſelves, and 24 of the velites, or 84 men. But a rectangle 100 feet long and 50 feet broad, contains 5000 ſquare feet, which divided by 84 gives likewiſe 59 ſquare feet and eleven twenty one parts of a ſquare foot.

We arrive at the ſame concluſion by dividing the number of ſquare feet contained in the whole ground aſſigned by Polybius for encamping all the foot of a legion, by 4200, the number of them. For the haſtati and principes encamped on 20 equal ſquares, of which each contained 10,000 ſquare feet, having its ſide equal to one hundred feet. The whole 20 then, of courſe, contained 200,000 ſquare feet. If to this number of ſquare feet there be added the contents of the ten equal rectangles of 5000 ſquare feet each, that were occupied by the ten maniples of triarii and their proportion of velites, or 50,000 ſquare feet, we get 250,000 ſquare feet for the ſurface of the whole ground, that the infantry of one legion encamped on, which number of ſquare feet divided by 4200 give 59 ſquare feet, and eleven twenty-one parts of a ſquare foot as before.

And as there were 300 horſe then in each legion, who were alſo divided into ten parts or troops, and encamped on ten equal ſquares of 10,000 ſquare feet each, it is no leſs evident that the encamping ground allowed for them was at the rate of 333 ſquare feet, and one third part of a ſquare foot for each horſeman or trooper and his horſe, ſince 10,000 divided by 30, or 100,000 divided by 300, give, 333 and one third.

Polybius alſo informs us that the excavation of the ditch and the raiſing of the rampart along the two tranſverſe ſides of the intrenchment, or thoſe near the wings of the allies, were done by them, and that the other two ſides were left to the Romans, to each legion one; that each ſide was divided into as many parts or portions as there were maniples to labour on it, and a centurion appointed to ſuperintend the execution of the work in each part, and that the whole ſide was inſpected and approved of by two of the tribunes, whoſe turn of duty it was to attend to every kind of neceſſary ſervice in and about the camp. For the tribunes, two by two in rotation, took upon them not only the care of the camp, but the management and direction of every thing done in it for two months at a time.

As in encamping, a place was fixed for the conſul's or general's tent before ground was laid out for any others, ſo on breaking up the camp, his tent and thoſe of the tribunes were always firſt taken down. And when they were all ſtruck, the baggage collected and placed on the beaſts of burthen, the whole camp on a ſignal made began to move, with the extraordinaries uſually in the van, and next to them the allies of the right wing, followed by the baggage of both. Next to them marched the firſt of the Roman legions with its baggage behind it; then followed the ſecond legion, having behind it not only its own baggage, but alſo that of the allies of the left wing, who cloſed the rear of the whole march.

Polybius in his deſcription of a conſular camp has not given us any dimenſions for the rampart and the ditch. Theſe muſt have varied with circumſtances and ſituations, and particularly with the length of time for which it was intended to be occupied. Julius Cæſar in the ſecond book of his war in Gaul, chap. v. informs us that he ordered one of his camps to be ſecured with a rampart 12 feet high, and a ditch 18 feet deep.

In deſcribing the Roman camp, Polybius does not give us either the names or number of the gates. He only informs us, that the exterior ſides of the camp were guarded at night by the velites, who placed ten of their number at every gate, and kept watch alſo in the day-time throughout the whole extent of the intrenchment. It is well underſtood, however, from the information left us by other hiſtorians, that there were four principal gates, viz. one in the middle of the front of the intrenchment oppoſite to the termination of the ſtreet of fifty feet wide between the cavalry of the Roman legions, another directly oppoſite to it in the middle of the rear of the intrenchment, and two directly oppoſite to each other, and to the ends of the ſtreet of 100 feet wide between the tents of the tribunes and the Roman legions in the tranſverſe ſides of the intrenchment. That one of the two laſt mentioned, which was on the right hand ſide of the camp, was called *porta principalis dextra*, and the other on the left hand ſide, *porta principalis ſiniſtra*. The other two principal gates, namely the two firſt mentioned, were called *porta prætoria* and *porta decumana*. But in regard to their real or actual ſituations, though all writers on the ſubject allow them to have been oppoſite to each other, doubts and different opinions have ariſen, ſome placing the decuman gate in the front ſide of the intrenchment and others in the rear. Thoſe, who contend for its having been placed in the middle of the rear ſide of the intrenchment, make it derive its name from this circumſtance, that ſuch of the ſoldiers, as had been found guilty of neglect of duty or delinquency, were conducted through it to the place appointed for their puniſhment or execution, and refer to the following words of Vegetius, book i. chap. 23, "Porta autem, quæ appellatur prætoria, aut orientem ſpectare debet, aut illum locum, qui hoſtes reſpicit; aut ſi iter agitur, illam partem debet attendere, ad quam eſt profecturus exercitus, intra quam primæ centuriæ, hoc eſt, cohortes papiliones tendunt, et dracones et ſigna conſtituunt. Decumana autem porta, quæ appellatur, poſt prætoriam eſt, per quam delinquentes milites educuntur ad pœnam.

The late major general Roy referring to this paſſage expreſſes himſelf in theſe words: "With regard to the decuman gate mentioned in this paſſage of Vegetius, it is to be obſerved, that for the maintenance of that rigorous diſcipline eſtabliſhed in the Roman armies, when a particular corps or any number of ſoldiers had miſbehaved in the field, or had been mutinous to their officers, it became neceſſary to decimate the delinquents, every tenth man being drawn out by lot and doomed to ſuffer death. Hence we may judge, that the decuman gate had its name from thoſe, who had received ſentence, being led out by it for puniſhment or execution." Military Antiquities of the Romans in Britain, page 50.

It does not follow, however, from the foregoing words of Vegetius, that delinquents were led out through the gate in the rear of the camp to receive puniſhment. It may juſt as well be inferred from them that they were carried out through the gate in the front of the camp. And from his obſerving that the prætorian gate ought to look either towards the eaſt or the enemy, we cannot exactly aſcertain whether it was cuſtomary for the Romans to make the front or rear of their camp look towards the eaſt. But this inference may reaſonably enough be drawn from them that the prætorian gate ſometimes looked towards the enemy and ſometimes not. Polybius, without making the four different aſpects of his conſular camp have any reference whatſoever to the eaſt, weſt, north, and ſouth, expreſsly ſuppoſes the front of it to look towards thoſe parts, that were moſt convenient for ſupplies of water and forage. If any one of the principal gates in his time went by the name of porta decumana, it was probably ſo called from the decumani manipuli, and decumanæ turmæ next to the front of the intrenchment. That it took its name from ſoldiers ſelected by decimation for puniſhment, being led through it out of the camp, is a ſuppoſition directly contrary to his authority; for he informs us, when ſpeaking of that puniſhment and the rigour of the Roman diſcipline, that it was actually inflicted within the camp.

Lipſius, whom moſt of the modern writers on the Roman caſtrametation as delivered by Polybius have followed, though a man of great learning, departs from ſome of the rules laid down by that hiſtorian. He leaves out the ſpace fifty feet wide between the ground, that was occupied by the tents of the tribunes, and the forum, prætorium, and quæſtorium, which Polybius expreſsly aſſigns for their horſes, beaſts of burthen, and other equipages, in theſe words, ἵπποις ἅμα δ᾽ υποζυγίοις καὶ τῆ λοιπῆ των χιλιαρχων αποσκευῆ τοπος. Now that their tents were not only in front of this ſpace, but alſo at ſome little diſtance from it, is evident from another paſſage in this hiſtory, where he informs us, that three companies were allotted to each tribune, who, among other ſervices they performed for him, furniſhed him always with a double guard, conſiſting of four ſoldiers, two of whom were ſtationed before his tent, and the other two behind it near to the horſes.

He allows, however, 50 feet in depth as we have done, for the tribunes' quarters; and this depth does not appear to be more than what was neceſſary for them, excluſive of the 50 feet allowed for their horſes, beaſts of burthen, &c. as they were the officers next in rank and dignity to the conſul and quæſtor, had, two by two in ſucceſſion, charge of the whole camp, and the ſuperintendance of every thing done in it, and had alſo all delinquents brought before them to be tried and to receive ſentence.

Although he leaves out the aforeſaid width of 50 feet left for the horſes, &c. of the tribunes, he quarters among the guards a number of volunteers, ſo greatly exceeding that which uſually attended one conſul, with two legions and the ordinary complement of allies, that he makes his camp 33 feet longer from front to rear than it is broad, contrary to the rule for keeping it always an equilateral quadrangle. In this particular, then, he departs not leſs than 83 feet from the rules laid down by Polybius, and makes the ground for quartering or encamping the extraordinarii in the rear deeper by the ſame number of feet than by theſe rules it could be.

Inſtead of making the quarters of the guards for the conſul and quæſtor commence, according to Polybius, from the laſt tents of the tribunes, or from the quæſtorium and forum, which extended on the right and left of the prætorium towards the tranſverſe ſides of the camp as far as the encamping ground of the tribunes, and that of the Roman legions did, he makes them begin 20 feet diſtant from the ſame.

Though Polybius neither mentions the præfecti of the allies, nor aſſigns any encamping ground for them, it is natural to ſuppoſe, that their quarters, like thoſe of the tribunes, extended the whole breadth of their own horſe and foot, and no farther, leaving a paſſage 50 feet wide between the laſt tent of the tribunes and the firſt of theirs, both on the right and left, which paſſages muſt have been very convenient as communications with the principia for the horſe guards, who fronted the forum and quæſtorium. Lipſius, however, makes the tents of the præfecti extend 29 feet into each of theſe openings, beyond the encamping ground of their own troops.

He alſo takes up ground for the quæſtor and two legati excluſive of that for the public, which he has no authority for from Polybius, who makes no mention at all in his account of the Roman caſtrametation of a legatus or legati.

As to the duke of Rohan's plan of a Roman camp, he leaves out with Lipſius the ſpace acroſs it 50 feet wide, expreſsly allowed by Polybius for the horſes, beaſts of burthen, baggage, &c. of the tribunes. He makes the ground for quartering the ſupernumeraries, ſtrangers, and part of the extraordinary, too deep by 50 feet, which additional depth being equal to the width of the ſaid ſpace left out behind the tribunes' tents, cauſes his plan to be a ſquare, though in his diſtribution of theſe quarters, he entirely miſtakes that hiſtorian's meaning. He alſo lays out the quæſtorium in various whimſical diviſions without the leaſt ſhadow of authority from that writer.

Sir Henry Saville, in his view of the military affairs of the Romans, gives a deſcription of their conſular camp, which he makes a ſquare or equilateral quadrangle, but 32 feet broader and deeper than it ought to be, by allowing the horſe of the allies 16 feet more depth on each ſide than their juſt proportion. He, in like manner, leaves out the ſpace 50 feet wide allowed to the tribunes for their horſes, beaſts of burthen, and baggage; but makes the encamping ground for the extraordinary that remain after thoſe ſelected for the guards are taken from them, and for ſtrangers and ſupernumerary allies, too deep by 82 feet, which being equal to the 50 and 32 feet juſt mentioned, conſtitutes the Roman camp as deſcribed by him a ſquare, of which the ſide, however, is 30 feet longer than it ought to be according to Polybius. He alſo makes the quæſtorium and forum too large, and the quarters of the guards too ſmall. He likewiſe gives the encamping ground of the præfecti of the allies an extent of 50 feet more than that which their own horſe and foot cover.

The late major-general Roy has profeſſedly given us a plan and deſcription of a conſular camp, and alſo a plan of a Roman camp, when both conſuls encamped together, or within the ſame intrenchment, in his military antiquities of the Romans in North Britain, publiſhed after his death in one volume in folio by the Royal Society of Antiquaries in 1793. But not being acquainted with the Greek language, he took the accuracy of Mr. Hampton's tranſlation of Polybius for granted, as he himſelf informs us, ſuppoſed with him the cavalry of the allies to have been triple that of the Romans, and on that erroneous ſuppoſition has grounded all his computations reſpecting their caſtrametation, and particularly in comparing the Polybian camp with thoſe in Scotland, that were firſt diſcovered by the learned, ingenious, and very able military antiquarian, general Melville, in 1754, who manifeſted a very fine and ſuperior degree of diſcrimination in concluding from Tacitus's narrative, and the reaſons of war, that Agricola muſt have croſſed the Tay above Perth, and proceeded along Strathmore, and that there were certainly ſome remains of his camps ſtill to be found in that vale, in oppoſition to the opinion of the engineers, who were then employed by government on a ſurvey of that country, and the perſevering aſſertions of one of them in particular, who had actually ſurveyed the ſituations, on which they were afterwards diſcovered by general, then captain, Melville, without knowing what they were. General Roy received from captain Melville, who was about to leave this country and repair to the Weſt Indies, a communication of that diſcovery, and firſt learnt from him, as he himſelf acknowledges, what was really meant by a temporary Roman camp, which information excited his curioſity, and led him to turn his attention to the ſubject of Roman military antiquities in Great Britain. But though he proſecuted it occaſionally for a number of years with a very laudable degree of zeal and induſtry, it muſt be allowed, that he committed ſeveral material and great miſtakes in his plan and deſcription of the Polybian conſular camp.

He leaves out the ſpace fifty feet wide behind the tents of the tribunes, expreſsly allotted by Polybius for their horſes, &c. He does not make the extent of the tribunes encamping-ground tranſverſely acroſs the camp, ſo great as that of the Roman horſe and foot, by about one hundred and fifty feet, leaving a diſtance of about two hundred feet between their firſt tents on the right and left; whereas Polybius tells us, that the one was equal to the other. His words are theſe: ἀφεϛᾶσι δ' ἀλλήλων μὲν ἴσον αἱ τῶν χιλιάρχων σκηναὶ, τοσοῦτον δὲ τόπον ἄϛε παρ' ὅλον τὸ πλάτος ἀεὶ τῶν Ῥωμαικῶν ϛρατοπέδων παρήκειν.

He leaves an open place or ſtreet of twenty five feet wide on the left of the prætorium, between it and the forum; then ſets off a rectangular ſpace of the ſame depth with the prætorium, and about one hundred and thirty feet wide, which he divides equally into two parts, the one next to the tents of the tribunes as quarters for the legati, and the other immediately behind that for the market-place, or forum; then leaves another ſtreet of twenty five feet wide; and on the remainder of the ground ſet apart by Polybius for the forum, extending as far as that occupied by the laſt tent of the tribunes on the left he encamps one half of the ablecti, or ſelect horſe of the allies for the conſul's guard. He then leaves a ſtreet fifty feet wide, making that between the haſtati and horſe of the allies on the left extend quite to the rear of the camp, then encamps half the evocati and volunteer horſe looking toward the prætorium, and cloſe behind them, with their backs to theirs, half the evocati, or volunteer foot; then leaves another ſtreet of twenty-five feet, and beyond that encamps half the ſelect foot of the allies for the conſul's guard. On the right of the prætorium, he in like manner leaves a ſtreet twenty five feet wide, then ſets off a rectangular ſpace as deep as the prætorium, and about one hundred and thirty feet broad for the quæſtor's quarters, and for the cloathing, arms, and proviſions behind them; then leaves another ſtreet twenty five feet wide; then encamps the other half of the ablecti, or ſelect horſe of the allies for the conſul's guard; and ſo on as on the left. In making all theſe ſtreets, diviſions, allotments, and allocations, he is ſo far from being ſanctioned by Polybius, that they are in direct repugnance and contradiction to that author's authority, who makes no mention at all of legati, but allows about five times as much ground for the forum, and about twice and a half as much for the quæſtorium as he does.

On each ſide of the ſtreet fifty feet wide, leading to the rear from that of one hundred feet in width behind the prætorium, he allots a rectangular ſpace of four hundred feet by one hundred and twenty five for the extraordinary horſe of the allies facing the ſaid broad ſtreet, and an equal ſpace on each ſide for the extraordinary foot of the allies immediately behind them and facing the rampart; then leaves on each ſide a ſtreet fifty feet wide, and laſtly makes two rectangular locations of four hundred feet by two hundred and fifty each for ſtrangers coming to the camp, thus prepoſterouſly allowing for occaſional comers, as much ground as he allots for the encampment of all the haſtati and principes, with four fifths of the velites of a complete Roman legion. The truth indeed is this: he makes the depth of the encamping ground in the rear of the prætorium one hundred and eighty three feet, and one third of a foot greater than it ought to be by Polybius's account of the Roman caſtrametation. And his camp taken altogether differs widely and eſſentially from the one deſcribed by that author. For he makes each ſide of the encampment one hundred and thirty three feet, and one third of a foot longer than it ſhould be, and each ſide of the intrenchment alſo of courſe. Of this, he ſeems to have been partly aware himſelf; for in page 45 of his work, when he uſes in the text theſe words, "therefore the ſide of the ſquare of intrenchment of a conſular army was two thouſand one hundred and fifty Roman feet," he in a note expreſſes himſelf in the following: "If according to Lipſius and others, who have copied from him, there had only been in the conſular camp twice the number of *allied foot* (he muſt unqueſtionably have meant to ſay *allied horſe*) that there was of Roman horſe, then the ſpace actually occupied by the troops would have been a ſquare of ſixteen hundred and ſixteen Roman feet, and two thirds of a foot." It is much to be regretted that there are many palpable errors and miſtakes in that elaborate, and in many reſpects valuable performance, which might have eaſily been avoided by a little proper attention to the printing of it. They are ſo numerous indeed, that we cannot allow ourſelves to regard it as a correct copy of the manuſcript, he left behind him.

The ſquare was the moſt convenient and beſt figure the Romans could have adopted for their encampments. Of all right-angled quadrilateral figures of the ſame perimeter, its area is a maximum, or the greateſt. It therefore required leſs extent of intrenchment than a rectangle of the ſame area or ſuperficial contents. And if we examine the diſpoſition or arrangement of the various locations they made within it for their troops, taking into conſideration at the ſame time the invariable ſimplicity and regularity of their method of encamping, we ſhall find, that there neither was any ground loſt nor any wanted to render it more commodious, and be apt to regard it as the beſt perhaps, that could have been contrived before the invention of gunpowder, and the uſe of fire-arms, which have made great and eſſential alterations neceſſary.

Even in modern encampments, however, ſo much of the Roman method is ſtill retained by all nations, that in encamping their troops, they conſtantly place the privates in the front, behind them the ſubalterns, then the captains, and in the rear of theſe the field-officers. And Frederick the Great, king of Pruſſia, tells us, that it was his cuſtom, in imitation of the Romans, to encloſe his camps with intrenchments, which, beſides anſwering other good purpoſes, contributed greatly to prevent deſertion.

We ſhall now proceed to give an account of modern caſtrametation, which is alſo regulated, in a great meaſure, by certain rules, that are liable, however, to be altered and varied in different ſituations and poſitions, ſo as to occupy the ground to the beſt advantage, and moſt commodiouſly for the free and uſeful operations of the different deſcriptions of troops, according to the opinion and judgment of the general, or officer commanding them.

Camps take different names, or denominations, from the objects thoſe have in view who form them; ſuch as for inſtance:

Camps offenſive,
Camps defenſive,
A camp of rendezvous,
A camp of paſſage,
A camp of reſt or repoſe,
A fixed or ſtanding camp,
A flying camp,
A camp of peace and exerciſe,
A camp for forage,
A camp of obſervation,
A covering camp,
An entrenched or retrenched camp.
An entrenched or retrenched camp in a campaign, or open country.

*Camps offenſive*, or camps for the attack, interruption, and annoyance of an enemy.

The principal objects which every general either has, or ought to have in view when he chooſes ground for a camp, are of two kinds, the one offenſive, and the other defenſive. The camp in which an army aſſembles, at the beginning of a war or the opening of a campaign, is of the firſt claſs or deſcription. In ſuch camps, attention ought chiefly to be paid to the convenience of the troops, who ſhould encamp in ſmall ſeparate corps near their magazines, or depots, in ſuch a manner, as to be able to unite in a ſhort time. And as ſuch camps are generally at ſome diſtance from the enemy, there is little or no danger to be apprehended from making the convenience and accommodation of the troops the firſt object of attention.

The moſt eſſential properties of every camp are health, fulneſs, and ſecurity. Theſe are advantages which ought to be attended to and ſought after on all occaſions. But an attention to wholeſomeneſs is ſtill more neceſſary in one that is to be occupied for a conſiderable length of time, than in another, where troops are to make but a ſhort ſtay. Low, wet, damp, and marſhy places ſhould be avoided in every country; and in hot climates, ſituations that are much expoſed to the burning heat of the ſun. On the other hand, riſing grounds with an eaſtern aſpect, commodiouſly ſituated for paſture, and for ſupplies of water, forage, and fuel, ought to be preferred to other ſituations for encampments.

A general ought to be a good judge of ſituations himſelf, and to chooſe his own camps. His knowledge ſhould not, as is ſometimes the caſe, be confined to the mere rudiments of the art of war, or to the fiddle faddle buſineſs of parades, reviews, and ſham fights, that have no reſemblance whatever to real actions. He ſhould be able to diſcern at ſight, or to diſcover with a glance of his eye, all the poſſible advantages, as it were, which any poſt or poſition is capable of affording, and to improve this talent in practice, by the principles of fortification, which are the baſis, or ground-work of it, and which he ought to carry with him into the field, and apply to every ſituation of his army, availing himſelf of heights, defiles, rivers, rivulets, moraſſes, inundations, woods, &c. When maſter of the rules of that ſcience, he can alſo apply it ſucceſsfully for finding out the weakneſs of the enemy's poſition and order of battle.

*A camp offenſive*, or of offence, is formed for the purpoſe of annoying an enemy in various ways, ſuch for inſtance, as to force him to raiſe a ſiege by cutting off, or ſtraightening his intercourſe with the adjacent parts of the country and his own depots; to compel him to quit an advantageous poſition by either attacking it at laſt if neceſſary, or by inveſting one of his towns or places; to make incurſions into ſome one or other of his provinces; to intercept his convoys; to embarraſs his communications; to conſume the forage he might draw benefit and advantage from; &c.

As ſecurity is always one of the firſt objects of conſideration, every camp, of whatever ſpecies or deſcription it may be, ought to have its front and flanks placed entirely out of the reach of inſult. In any ſituation, therefore, that is choſen or fixed on for a camp, (and there are various ways of occupying the ſame ground) care ſhould be taken not to extend either flank towards the enemy, or to expoſe it to commanding ground within cannon-ſhot, that he may have it in his power to occupy or poſſeſs himſelf of, but to place it in ſuch a manner as to make it afford ſupport to both wings of the army. It ought to be guarded and ſecured both in front and rear by detachments; and particular attention ſhould be paid to its lying commodiouſly for paſture, forage, water, and wood, which is not only uſeful as fuel, but for pickets, paliſades, and other purpoſes. It ſhould alſo be conveniently ſituate for the army that occupies it, to move out of it either to form in order of battle, or to abandon it altogether without being expoſed to much moleſtation from the enemy, who, did he command the principal avenues or approaches to it, would have it in his power to ſhut them up, and thereby force them either to ſurrender, or to attack and fight him on very diſadvantageous terms. There are many ſituations that appear to be very ſtrong, and naturally are ſo, which, from this very circumſtance of troops not being able to quit them when neceſſary without expoſing themſelves, are in reality both weak and dangerous. And an unſkilful general may be led by the mere appearance of them into great miſtakes, and thereby, not only draw diſgrace on himſelf and his troops, but alſo plunge his country into the moſt diſaſtrous calamities. But a knowledge of fortification will enable a commander of naturally good talents to chooſe heights, and occupy them in ſuch a manner, as to prevent their being commanded by others; to cover his flanks effectually, ſo as to ſecure each poſt as to render it capable of defence, and to avoid thoſe, in which a gallant officer cannot maintain his ground, without running the riſk of loſing his reputation.

*Camps defenſive*, or camps of defence. Such camps are ſtrong by their ſituations chiefly, and have no other deſign than that of preventing attacks. Every ſituation that has its front and flanks equally ſtrong, and is free and open behind, is proper for this ſort of camps. There are heights that have a front of a certain extent, and their flanks covered by moraſſes, and poſitions, that are ſecured in front by a river or marſhy rivulet, and their flanks by ponds. Such camps having no other object than to prevent their being attacked by the enemy, great care ſhould be taken not to fix on falſe points of ſupport. For this purpoſe, the rivers and marſhes in their front, and on their flanks, ought to be ſounded in order to aſcertain whether the rivers are not fordable, and the marſhes impracticable.

When ſuch a camp has a river in its front, it ſhould not be placed nearer to the bank thereof than eight hundred or a thouſand paces, in order to leave ground ſufficient for drawing up the army in order of battle.

Poſitions taken under the protection of towns or places, are defenſive camps.

When the object of a defenſive camp is to cover a country, the principal attention of a general in chuſing it ought to be directed to thoſe points, which the enemy has it in his power to attack, and by which he might penetrate.

*Camp of rendezvous*. When at the commencement of a war, or the opening of a campaign, an army is brought together in the field, either in one entire body, or in a ſeparate corps, or parties, at no great diſtance from one another, it is ſaid to be in a camp of rendezvous. Such a camp is either more or leſs out of the reach of the enemy, and in the firſt of theſe caſes the convenience of the troops ought to be the firſt object of attention. It is alſo ſometimes intended to be offenſive, and ſometimes defenſive. When it is formed for the purpoſe of offenſive operations the following maxims ought to be obſerved:

To avoid extending either flank towards the enemy, or expoſing it to ground that he can take poſſeſſion of; to chooſe a poſition for it ſtrong by nature; to ſupport well the wings; and to ſecure it againſt ſurpriſe or any ſudden aſſault by detachments, both in front of, and behind it.

To proportion its extent to the ſtrength of the army.

If you are in an open and level country, to encamp your army in order of battle, and if you cannot ſecure your camp againſt inſult or ſurpriſe by detachments, to throw up intrenchments ſufficient to prevent your being obliged to fight contrary to your intention or inclination, or when it is not neceſſary for you to come to action.

In a broken or uneven country, to ſeparate your army without encamping the different corps at too great a diſtance from one another, occupying the highways, villages, &c. in your front.

In a mountainous country, to encamp your troops according to the ſituation and nature of the ground, but in ſuch a manner that the moſt advanced corps may receive prompt aid and ſupport from the reſt.

Not to place your cavalry on either wing when it is near a wood, village, or other place, into which the enemy can throw in ſome of his infantry; but ſometimes to place them all on one wing, and ſometimes to encamp them in a ſecond line, or otherwiſe, as the ground and circumſtances may point out.

When the enemy is on the oppoſite ſide of a river, rivulet, moraſs, &c. to encamp at a ſufficient diſtance from it to prevent your being incommoded by his fire, in even forming your army in order of battle in front of your own camp.

To reconnoitre the highways, rivers, riſing grounds, rivulets, ferries, caſtles, woods, and other places in the neighbourhood of your camp; and to keep open a communication between its rear and ſeveral roads, for the purpoſe of receiving ſupplies of proviſions, &c.

To chooſe your camp in ſuch a manner, that the enemy, by moving on his right or left, may not oblige you to quit your poſition, but on the contrary, that by making a ſhort or ſmall movement yourſelf you may compel him to make a long or circuitous one, and to quit his poſition or leave the country.

This is the ſureſt criterion by which one can judge of the ſkilful or unſkilful choice of a camp.

And, in ſhort, though you are acting offenſively, to take every poſſible precaution for the ſecurity of your camp when the enemy is near you, and by no means to deſpiſe him. For negligence and contempt of an enemy tend always to render him bold and enterpriſing.

When defenſive operations are the object of a camp of rendezvous, it is neceſſary to obſerve, beſides theſe, the following maxims:—

To avoid encamping in a plain or level country.

To attend particularly to the extent of the ground you occupy, and to the number and nature of the troops your army is compoſed of.

Always to entrench your camp, taking care that no part of it can be enfiladed.

To occupy the bridges and fords of rivers, &c. and if you are apprehenſive of ſuffering by inundations, to make dikes to turn the courſe of the water.

To avoid placing either of your wings behind a moraſs, or any thing elſe, that may be an obſtacle to its manœuvring eaſily, and co-operating with the reſt of your army in caſe of an attack.

To place your artillery on heights, and diſpoſe of it in ſituations from which it can do moſt execution.

And to keep open a free and convenient egreſs from it in the rear, that your retreat may not be cut off.

*A camp of paſſage.* In an offenſive war troops encamp tranſiently, when they march either to attack an enemy, or to diſlodge or force him from a poſt, by different manœuvres; or to get before him to ſome paſſage, and penetrate into his country ; or to inveſt a place, and form the ſiege of it ; or, in ſhort, to join an advanced corps or army.

In a defenſive, as well as an offenſive war, they occupy a camp of paſſage when they take poſt to cover their country; when they are obliged to regulate their movements by thoſe of their enemy ; when their object is to effect ſome junction; or, finally, when they are conſtrained to abandon a poſt, a frontier, or even one part of their country to cover another.

*A camp of reſt or repoſe*, is that in which troops either wait for forage, or watch the enemy's motions, in order to regulate theirs by his, or in which they are allowed to remain for ſome time ſtationary on account of ſickneſs or ſome other cauſe. As repoſe is the ſole object in ſuch a camp, it ſhould have ſuch a river or moraſs in its front as renders it inacceſſible. And if the river, rivulet, or moraſs in front of it has not a ſufficient depth of water it ſhould be dammed up ſo as to be impaſſable.

Such a camp ſhould not only have its front naturally ſtrong, but alſo have a ſite or ſituation that is elevated and healthy ; and when it is of a permanent nature, it ſhould have abundance of water, wood, forage, and proviſions, within its reach and command, and ſhould cover the road or route of all its convoys.

*A fixed or ſtable camp* may have different objects, according as an army acts offenſively or defenſively.

When it is on the offenſive, it occupies ſuch a camp for a certain time, to form the ſiege or blockade of a place ; to wait the effect of a diverſion or the capture of a place, which a detached corps has been ſent to attack ; to give a reinforcement or convoy time to arrive ; to conſume or deſtroy, during the courſe, or towards the end of a campaign, the forage or ſubſiſtence of a country, which they deſign to abandon ; to give reſt or repoſe to an army after a long march or operation that may have cauſed a loſs of men, or occaſioned diſeaſes, or, in fine, during the courſe of a campaign, that has not been ſo proſperous or fortunate as was at firſt expected.

When a general encamps before a place to attack it, which he knows the enemy cannot aſſemble a ſufficient force to attempt the relief of, and when he has little to fear from any detachments he may ſend out, either for that purpoſe or to interrupt the operations of the ſiege, he has then only to diſtribute his troops round the place as commodiouſly as he can, ſeizing on commanding grounds and other advantageous objects, and taking care to have his circumvallation as near to it as poſſible, provided he is juſt out of the reach of annoyance from the beſieged's ſhot and ſhells.

When he is on the defenſive, he chooſes a ſtable camp to cover his country, or ſome place of importance, that the enemy deſigns to beſiege. Beſides theſe two objects, a ſtable camp has ſeveral others, which are common to it with camps of other denominations. There is one, however, which it may not be improper to mention, which is this, that a general can remain in it till he ſees his enemy ſeparate his forces, and ſend them into winter quarters, in order that he may go into his own without dread of diſquietude or moleſtation.

*A flying camp* denotes a corps or body of troops conſiſting of three, four, five, ſix, &c. thouſand men, infantry and cavalry, that has power to encamp and decamp at the pleaſure of the general or officer commanding it, as neceſſity and circumſtances may require, that is continually in the field, and is conſtantly making divers movements to haraſs the enemy, ſtop his incurſions, check and render abortive his enterpriſes, intercept his convoys, teaze and fatigue the neighbouring country, and to throw itſelf, in caſe of need, into a beſieged place, that is in want of ſuccour or aſſiſtance.

Though there is ſome difference between the command of a flying camp and a large army, the reſemblance, however, is ſo great, that a general officer, who has often commanded a detached or ſeparate body of troops is, *cæteris paribus*, fitter for the command of a large army than one who has not enjoyed that advantage.

A general officer, therefore, who is ambitious of preferment, anxiouſly endeavours to procure for himſelf ſuch commands and to qualify himſelf for them.

A flying camp occaſions much uneaſineſs and diſquietude to an enemy, by hovering on his wings. It is deſtined to cover ſome tract of country between two armies ; to make head againſt ſome ſimilar corps, that the enemy has formed or detached ; to undertake and execute ſome particular enterpriſes ; to throw troops into ſome place that is menaced or threatened ; to draw contributions from certain diſtricts, and to regulate its movements at the ſame time, in ſuch a manner as always to have it in its power to join the main army after a march of one or two days at moſt, in order that, if a favourable opportunity for a general engagement ſhould preſent itſelf, it may arrive in time to take a ſhare in it.

The general, who commands a flying camp, ought to be extremely attentive and vigilant, to have his troops highly diſciplined, to ſuffer no ſtraggling or diſperſion of them, to march with great precaution, to chooſe advantageous camps, and to regulate his movements in ſuch a manner as to be always in readineſs to ſurpriſe his enemy when it is poſſible, without running the riſk of being ſurpriſed himſelf. He ſhould be alert againſt all ſorts of enterpriſes on the part of the enemy. He ought to have parties always on the look out, and to relieve them ; and he ſhould not be ſparing in the employment of ſpies, of whom he may have enough if he only pays them well. Money can ſeldom be more uſefully employed.

*A camp of peace and exerciſe*, is a camp deſtined for the exerciſe of all the military duties and functions.

In ſuch peaceable encampments the troops ſhould be trained up and inſtructed in every ſort of fatigue, labour, and duty, which is neceſſary on actual ſervice, for rendering warfare ſucceſsful. In ſuch a ſituation an active and able general will not only have them practiſed in throwing up works expeditiouſly, but will alſo turn a great part of his attention to their diſcipline. He will make them encamp in order of battle, and cauſe every part and branch of the ſervice to be performed with as minute accuracy, and as punctual an obſervance of orders, as if they were in the field, or in the face of an enemy. He will examine whether the officers on guard are ſufficiently vigilant and acquainted with every particular of their duty, and whether the guards themſelves are poſted according to orders. He will not only have the infantry exerciſed frequently, but the cavalry alſo, when they are not employed in foraging, and the recruits of both daily. He will inſpect and look at the horſes himſelf, praiſing thoſe officers, who have been careful of them, and ſeverely reprimanding thoſe who have neglected to have them taken care of. In ſhort, he will by his vigilance and attention, in making every part of his army perform its duty with punctuality and exactneſs, give activity, ſkill, and animation to the whole, and prepare them for acting with vigour, advantage, and ſucceſs againſt an enemy.

*A camp of forage, or for foraging.* Such camps are ſometimes at a diſtance from and ſometimes near to the enemy. In the firſt caſe, neither your camps nor foraging parties are in danger of moleſtation or inſult. There are certain precautions, however, that ought never to be neglected, even when you have nothing to apprehend from any attempts of the enemy. Your camps therefore ought, in either caſe, to be ſtrong by nature, or rendered ſo by art, and particularly in the laſt, when you are near to an enemy. Beſides, a ſtrong camp enables you to ſend out ſtronger foraging detachments than you could otherwiſe venture to do; and on this ſervice it is ſometimes neceſſary to employ a great part of your army. Foraging is certainly an eſſential part of the art of war; and parties of foragers may very juſtly be conſidered as detachments ſent out againſt the enemy. A rich and fertile tract or diſtrict of country ſhould be choſen for it, and ſecrecy ought to be obſerved in regard to the time when, and the place where, you intend to forage. Your orders reſpecting this ſervice ſhould not be communicated even to the officer, who is to command the troops employed on it, till late in the evening before it is to be performed. You ought, on ſuch occaſions, to detach a number of ſmall parties to acquire an exact knowledge of the enemy's motions. And, if you are on your guard againſt ſtratagems, it will be ſafer for you to forage when he does than at other times.

*A camp of obſervation* is the camp of an army employed in watching the motions and operations of an enemy, in haraſſing and perplexing him, and preventing him from penetrating in a country or tract of territory, to ſurpriſe or take an important place, or to moleſt another army, and force it to abandon its preconcerted enterpriſes and deſigns. An army of obſervation, during a ſiege, is almoſt always in motion and on the look out, occupies the avenues or approaches by which the enemy can preſent himſelf, follows him in his movements, keeping parallel to him, but conſtantly between him and the beſieging army, in the moſt advantageous manner it can, to avoid being obliged to fight contrary to its inclination, and ſometimes ſeizes on a commanding poſt, and there entrenches itſelf, when its camp may be called.

*A covering camp,* which appellation is given both to ſuch an encampment for covering a ſiege, and to poſitions choſen for camps that are deſigned to cover a country or diſtrict. In chooſing one for the laſt of theſe objects it is not neceſſary to pay ſo much attention to the natural ſtrength of the place itſelf as to the parts or paſſes, through which the enemy may or muſt attempt to penetrate, if he expects to penetrate at all. Theſe ſhould be occupied and ſecured by your army, in thoſe places where they are moſt eaſily defended, and where he cannot attack you without great hazard and danger. By acting judiciouſly in this manner you will, with very inconſiderable movements on your part, oblige him to take long and circuitous routes, and thereby haraſs his troops without being able to carry on any ſolid operations.

*An intrenched or retrenched camp.* Such a camp is ſometimes made during a campaign on the field, ſometimes before a place, and ſometimes under a place.

The ancients, and particularly the Romans, did not remain, even for an inconſiderable length of time, in any place without fortifying it. Their intrenchments did not hinder them from marching againſt the enemy when it was thought proper; but they put their armies out of the reach of inſult, particularly when they were compoſed of new levies or of raw and unexperienced troops, furniſhed places of ſecurity for their baggage and proviſions, and enabled them to ſend out large foraging detachments without expoſing their camps to inſult.

It is not ſufficient, when one is on the defenſive, to have your camp on a ſituation naturally ſtrong. It is alſo neceſſary, particularly when the enemy is under the neceſſity of coming to attack you, to remedy and remove the ſmalleſt defects of ground or poſition by intrenchments, which put you completely under cover, and place you in a condition to make a vigorous and obſtinate defence.

In an open or level country, it is adviſable for you, in conſtructing your intrenchments, to avail yourſelf of every advantage that the ground offers, to profit by rivers, rivulets, moraſſes, canals, marſhes, hollow ways, ditches, villages, incloſures, caſtles, &c. and to proportion the relative degrees of ſtrength in your intrenchments, in different places, in ſuch a manner as to render every part of your poſition equally ſtrong.

In a woody and mountainous country, you ſhould not only take all the precautions neceſſary to be obſerved in an open and level one, but ought alſo to make abattis, dikes, batardeaux, &c.

An intrenched or retrenched camp before a place, has for its object both offence and defence, when the enemy is either in ſufficient ſtrength to attempt to raiſe the ſiege, and to throw in ſuccour and relief to the beſieged, to enable them to hold out for a longer time than they otherwiſe would be able, or when the beſieged themſelves are ſufficiently numerous to make ſtrong and frequent ſallies. In the firſt caſe a line of circumvallation is made to ſecure the beſieger's army againſt all attempts from without; and in the ſecond a line of contravallation is thrown up between the beſieger's camp and the place, to prevent any moleſtation or interruption on the part of the beſieged from within.

In conſtructing both theſe lines you ſhould be particularly careful to occupy the moſt commanding and advantageous ground round the place, whether it be a little farther from or nearer to it than you could wiſh, availing yourſelf of heights, ravines, &c., and making uſe of abattis where there is wood, and every thing elſe from which you can derive advantage. If they are interſected by rivers, rivulets, canals, moraſſes, &c. you ſhould have ſecure and convenient bridges and ways of communication between the different parts.

An army of obſervation is even of the greateſt advantage at the commencement of a ſiege. It watches over the beſieger's preſervation till he firmly eſtabliſhes himſelf, can forward his operations, eſcort his convoys, ſupply him with faſcines, and perform many other ſorts of labour for him. Theſe two armies ſhould always be within reach of each other, particularly at the beginning, that they may be able to afford mutual aid and ſuccour to each other, and keep the enemy at a diſtance, who will naturally be afraid of approaching too near, if they are too powerful for him, leſt they ſhould fall upon him conjointly, and attack him with advantage.

Intrenched or retrenched camps under places, which are aſcribed by ſome to the celebrated marſhal Vauban, who recommends the forming of them at moſt frontier places, have defence only for their object. A camp of this ſort may have one particular object only, or ſeveral objects at once. Near or under a place of importance, it ſerves to render the attempt to beſiege it the more difficult, and to retard or hinder the taking of it. Under a place ſurrounded by heights, as well as one that has only a ſimple incloſure or bad fortifications, it becomes neceſſary for its defence. When there is a number of troops in a place, it is uſeful for aſſembling them in, for placing them commodiouſly, and for putting them in a condition to act againſt the enemy, as occaſions may preſent themſelves. It is a ſupport for an army that is not ſtrong enough to take the field, and is convenient for the inhabitants of the neighbourhood to retire to with their effects.

The depth of a regiment of infantry encamped, conſiſting of nine companies of 100 men each, from the ſerjeant's tents to the rear, uſed to be 200 yards, and the front 245, including the battalion-guns. A regiment of infantry of the ſame ſtrength is now allowed 200 yards in front, including its two battalion guns, and 520 yards in depth.

A regiment of dragoons encamped, conſiſting of ſix troops that form three ſquadrons, with the light troops, uſed to take up 200 yards in front and 258 in depth; and the interval between two regiments of infantry or cavalry uſed to be 60 yards.

A ſquadron of horſe has now a front of 120 yards; and an interval of 100 feet is allowed between each regiment.

The forming of an intrenched camp, near a town or village, is attended with many advantages. It furniſhes room for eſtabliſhing magazines for ſtores, forage, baggage, and for the ſick and wounded. The houſes and buildings help to cover its flanks, and thereby enable you to render it more compact than it otherwiſe could be made. Such a camp alſo covers and protects a place that has not works or fortifications ſufficiently ſtrong to reſiſt an enemy. When the ground is favourable for the purpoſe, ſuch a camp may be formed in the figure of a ſquare, or nearly ſo, which will require much leſs extent of intrenchment than a long rectangular one, and is more defenſible.

Some able generals have been for rejecting lines altogether; among which number is the celebrated marſhal Saxe, who is a great advocate, however, for redoubts in front of an army, and mentions particularly the wonderful advantage they were of to Peter the Great and the Muſcovites at the battle of Pultowa. It muſt be allowed that lines and intrenchments are often thrown up on a campaign very injudiciouſly and to little purpoſe; and unleſs ſome parts of them be cloſed in the rear, they are totally loſt the moment they are forced or carried in any one point. But ſuch temporary lines and intrenchments for tranſitory camps are different from thoſe we have juſt been ſpeaking of, either before or under places.

Frederic II., king of Pruſſia, has propoſed to form lines or retrenchments with ſquare redoubts, placed in ſaliant and re-entering angles, with an angle of each outwards or towards the enemy, joining them with trenches, as in *fig.* 4. *Plate* v. *Military*, &c. He obſerves, that the redoubts in the ſaliant angles ought not to be above 600 paces diſtant from one another; but 600 yards are diſtance enough. And the ingenious general Lloyd has propoſed a ſimilar arrangement of redoubts, in front of an army drawn up in order of battle, without joining them with trenches, but leaving the intervals between them open.

*Fig.* 1. *Plate* v. is marſhal Vauban's form of lines, and *figures* 2. and 3. are his firſt and ſecond profiles of them.

*Fig.* 5. is a form for lines, with baſtions and broken curtains.

Camp, *city*, *caſtra urbana*, was a place near the city-wall not far from the *via nomentana*, where the prætorian guard were encamped; whence it was alſo called the *prætorian camp*, *caſtra prætoria*, or *prætoriana*. The like we alſo read of at Jeruſalem, called by St. Luke abſolutely the *camp*, παρεμβολη. By which we are doubtleſs to underſtand the *caſtra antonia*, which Joſephus tells us, was afterwards uſed as a caſtle.

Camps, *mooned*, *caſtra lunata*, thoſe made in figure of a half-moon.

Camp, *naval*, *caſtra nautica*, or *navalia*, denoted a ſtation of ſhips.

Camp, *ſtanding*, *caſtra ſtativa*, was that wherein they deſigned to continue longer in a place; and therefore more pains were taken to fortify and regulate it.

The Roman camps, in a march, were alſo called in the middle age *manſiones*. See Camp, *ſupra*.

Camp, *ſummer*, *caſtra æſtiva*, among the Romans, was ordinarily light and moveable; ſo that they might be ſet up, or taken down, and removed in a night. In which caſe it was alſo called ſimply *caſtra*. See Camp.

Camp, *winter*, *caſtra hyberna*, or winter-quarters, were uſually taken up in ſome city or town; or elſe ſo contrived as to make almoſt a town of themſelves. See Camp.

Camps, *tertiated*, *caſtra tertiata*, thoſe which were a third part longer than broad, which Hyginus repreſents as the Roman model. *Caſtra in quantum fieri potuerit tertiata eſſe debebant—ut puta in longum duo millia quadrigenti, in latum mille ſexcenti pedes.*

Camp is alſo uſed among the Siameſe and Eaſt Indians, for a quarter of a town aſſigned to foreigners, wherein to carry on their commerce.

In theſe camps, each nation forms itſelf a kind of city apart, in which their ſtore-houſes and ſhops are, and the factors and their family reſide.

The Europeans at Siam, and in moſt other cities of the Eaſt, are exempted from this reſtraint, and allowed to live in the cities and ſuburbs, as they find them moſt commodious.

Camp *colours-men*, are ſoldiers appointed to attend and aſſiſt the quarter-maſter general, in marking out, and keeping the camp clean, receiving and diſtributing proviſions, &c.

The camp colours-men are drawn a man out of a company, that are exempt from all other duty during the campaign: each carries either a ſpade or a hatchet, or a pole bearing colours.

Camp *Diſeaſes*, or the diſeaſes incident to armies, are ſuch as ariſe chiefly from expoſure to the heat and inclemency of the weather, and from infection. Conſequently they are different, according to the ſeaſon of the year, and to the climate and ſoil of the country in which the army is engaged. The ancient maxim of Hippocrates, that "the ſummer and autumnal ſeaſons are the moſt ſickly," is confirmed by ſir John Pringle, not only with regard to warm climates, but to every camp, where men are neceſſarily much expoſed to heat and moiſture, the great cauſe of putrid and contagious diſeaſes. (Obſ. on Diſ. of the Army, P. II. ch. i.) The diſeaſes of ſummer and autumn are, remitting and intermitting fevers, cholera, and dyſentery. But the latter, though produced by heat and moiſture, is propagated extenſively by contagion: it declines, however, with the autumn; but the remitting fevers continue as long as the encampment, and never entirely ceaſe till the froſts begin. In the winter, inflammatory diſeaſes chiefly prevail, ſuch as coughs, pleuriſies, acute rheumatiſms, inflammation of the brain, bowels, and other leſs important parts: and the conſequences of theſe are often conſumptions, chronic coughs, and rheumatiſms.

Independently of the noxious effluvia from marſhes, from the privies of the camp, and the putrid ſtraw in the tents, which ſpread diſeaſes through a camp, the ſoldiers are often attacked with the typhous or putrid fever, when crowded together in hoſpitals and barracks in conſequence of the confined air; hence this fever has been demoninated the *hoſpital* fever.

There are other cauſes, alſo, which contribute to the production of diſeaſes in an army, partly by prediſpoſing the body to be more eaſily affected by noxious agents, and partly by actually exciting diſeaſe; ſuch are errors and irregularities in diet, the uſe of bad water, intemperance in ſpirits, the extremes of fatigue and inactivity, loſs of reſt, and want of cleanlineſs. The means of limiting the operation of theſe cauſes were ſuggeſted by Drs. Pringle, Monro, and other authors; and conſiderable improvements in the clothing, and means of ſubſiſtence of the men, in the ventilation of hoſpitals, &c. have been adopted, by which the number and mortality of camp-diſeaſes are ſomewhat diminiſhed.

Camp *duty*, in its utmoſt extent, includes every part of the ſervice performed by the troops during the campaign. But in a more particular ſenſe, it denotes the duty performed by guards and detachments, for the ſecurity of the camps, and preventing ſurpriſes.

Part of the camp duty is performed in the ſame manner as that of a garriſon.

Camp *fight*, or Kamp *fight*, in *Law Writers*, denotes the trial of a cauſe by duel, or a legal combat of two champions in the field, for the deciſion of ſome controverſy.

In the trial by camp fight, the accuſer was, with the peril of his own body, to prove the accuſed guilty; and by offering him his glove, to challenge him to this trial, which the other muſt either accept of, or acknowledge himſelf guilty of the crime whereof he was accuſed.

If it were a crime deſerving death, the camp fight was for life and death: if the offence deſerved only impriſonment, the camp-fight was accompliſhed when one combatant had ſubdued the other, ſo as either to make him yield, or take him priſoner. The accuſed had liberty to chuſe another to fight in his ſtead, but the accuſer was obliged to perform it in his own perſon, and with equality of weapons.

No women were permitted to be ſpectators, nor men under the age of thirteen. The prieſt and the people, who looked on, were engaged ſilently in prayer, that the victory might fall on him that was right. None might cry, ſhriek, or give the leaſt ſign; which, in ſome places, was executed with ſo much ſtrictneſs, that the executioner ſtood ready with an axe to cut off the right hand or foot of the party that ſhould offend herein.

He that, being wounded, yielded himſelf, was at the other's mercy, either to be killed or ſuffered to live. But if life were granted him, he was declared infamous by the judge, and diſabled from ever bearing arms, or riding on horſeback. Verſteg. Reſt. Dec. Intell. cap. iii. p. 51. See Acre-*fight*, Battle, Champion, and Combat.

Camp *hoſpital*. See Hospital.

Camp *law*, a method of deciding controverſies by duel or camp-fight.

Camp-*mills*, in the *Military Art*, denote portable or moveable mills, which can be uſed, particularly in time of war, when there are neither wind-mills nor water-mills in the neighbourhood, and which, on that account, formerly accompanied armies, in the ſame manner as camp-ovens and camp-forges. Some of theſe mills have ſtones for grinding the corn, and others are conſtructed with a notched roller like thoſe of our coffee-mills. Some of them are alſo ſo contrived, that the machinery is put in motion by the revolution of the wheels of the carriage, in which they are placed; and others, more commonly, are driven by horſes or men, after the wheels of the carriages are ſunk in the ground, or faſtened in ſome other manner. The invention is aſcribed to Pompeo Targone, engineer to the marquis Spinola, about the end of the 16th century. Others aſcribe the invention to the Germans, about the year 1633. Beckmann's Hiſt. Invent. vol. iii. p. 160.

Camp of *Gold Cloth*, in *Hiſtory*, a denomination given to the ſcene of interview between the kings of France and England, Francis and Henry, and their reſpective queens, in 1519; ſeated between Ardres and Guines. This interview was conducted with ſingular magnificence and ſplendour; it laſted 10 or 12 days, exhauſted the treaſures of both monarchs, ruined many of their nobility, and terminated without anſwering any uſeful purpoſe.

CAMPACH, in *Geography*, a river of Carinthia, which runs into the Moll, near Velach.

CAMPÆ, in *Ancient Geography*, a town of Cappadocia, in the department of Cilicia. Ptolemy.

CAMPAGNA, in *Geography*, a town of Naples, in Principato Citra; the ſee of a biſhop, ſuffragan of Conza; 16 miles E. N. E. from Salerno, and 13 S.S.W. from Conza.

Campagna *di Roma*, formerly *Campania*, a province of Italy, in the ſtate of the church, comprehending the greater part of ancient Latium, and bounded on the north by the river Sabina, on the eaſt and ſouth-eaſt by Abruzzo Ultra and Lavoro, on the ſouth-weſt by the Mediterranean, and on the north-weſt by the Patrimony of St. Peter. It is about 60 miles long on the Mediterranean ſea, and 33 broad. The country contains many beautiful plains, and the ſoil is fertile; but a great part of it is inſalubrious on account of the Pontine marſhes, ſo that there are few towns or villages, and the inhabitants are poor. Several attempts have been made to drain theſe marſhes, and they are now traverſed by a firm road. By theſe means, and ſome internal regulations in favour of the huſbandmen, the inſalubrity of the air is likely to be corrected, and the population and fertility of the province increaſed. The unwholeſomeneſs of the climate in this province is ſaid to have commenced after the invaſion of the Goths in the 5th and 6th centuries; and to have been owing to the accumulated ruins of the edifices of Rome, which raiſed the bed of the Tiber, and cauſed its waters to ſtagnate and to overflow. The exhalations proceeding from ſuch a maſs of ſtagnated waters, contributed very much to infect the air of this hot climate. This evil, reſulting from the ſame cauſe, was aggravated as long as Rome was expoſed to the incurſions and devaſtations of the Lombards, the Normans, and the Saracens, which laſted for ſeveral centuries. At the beginning of the 13th century, the air was become ſo infectious, that Pope Innocent III. ſays, that few people at Rome attained to the age of 40 years, and that it was very uncommon to ſee a perſon of 60. When the papal ſee was transferred to Avignon, and during the 72 years of its continuance there, Rome became a deſert. Its monaſteries were converted into ſtables; and Gregory XI. on his return to Rome in 1376, could ſcarcely count in it 30,000 inhabitants. His death was ſucceeded by the weſtern ſchiſm, which continued upwards of 50 years; and when this ſchiſm terminated in 1492, Martin V. and thoſe who immediately ſucceeded him, were able to make but feeble efforts againſt ſo inveterate an evil. It was not till the commencement of the 16th century, that Leo X. vigorouſly attempted to reſtore the ſalubrity of the air; but the two ſieges of Charles V. plunged it again into its old calamities; and the number of inhabitants, which in the time of Leo X. amounted to 85,000, was reduced under Clement VIII. to 32,000. Since the time of Pius V. and Sixtus V. towards the cloſe of the 16th century, the popes have been aſſiduous in their endeavours to purify the air of Rome and its environs, by procuring proper diſcharges for the waters, drying up the moiſt and marſhy grounds, and covering the banks of the Tiber and other places that were deemed uninhabitable with ſuperb edifices. Since that time a perſon may dwell at Rome, and go in or out of it, at all ſeaſons of the year. But at the beginning of the laſt century, they never ventured to ſleep at Rome, even in the day, in any other houſe beſide their own. But theſe ſcruples, ſays M. Condamine, have of late very much ſubſided; and he ſays, that he has ſeen cardinals, in the months of July and Auguſt, go from Rome to lie at Fraſcati, Tivoli, Albano, &c. and then return the next or the following days to the city without any detriment to their health; and he adds, that he has himſelf tried all theſe experiments, without the leaſt inconvenience. "We have even ſeen," he ſays, "in the laſt war in Italy, two armies encamped under the walls of Rome, at the time when the heats were the moſt violent. Nevertheleſs, the country people in general dare not ſtill venture to lie, during that ſeaſon of the year, nor even ſo much as ſleep in a carriage, in any part of the territory comprehended under the name of the Campagna of Rome." The amphitheatre of hills that bound the Campagna on one ſide is crowned with towns, villages, and villas, which form very delightful landſcapes. The ancient Romans were accuſtomed to ſeek ſhelter from the ſcorching heats of ſummer among the woods and lakes of thoſe hills; and the cardinals and Roman princes, at the ſame ſeaſon, retire to their villas; while many of the wealthier citizens take lodgings in the villages, during the ſeaſon of vintage. The principal cities or towns of Campagna, are Rome, Velletri, Fraſcati, Paleſtrina, Terracina, Nettuno, and Oſtia. N. lat. 41° 18′ to 42°. E. long. 12° 14′ to 13° 29′.

CAMPAGNAC, a town of France, in the department of Aveyron, and chief place of a canton in the diſtrict of Milhau; the place contains 1531 inhabitants, and the canton 6107. The territory comprehends 140 kiliometres, and 7 communes.

CAMPAGNE, a town of France, in the department of the Straits of Calais, and chief place of a canton in the diſtrict of Montreuil; 2 leagues weſt of Heſdin. The place contains 1209, and the canton 11,508 inhabitants: the territory includes 212½ kiliometres and 25 communes.

CAMPAGNOL VOLANT, (Daubent,) in *Zoology*, Schreber's VESPERTILIO HISPIDUS, and great bearded bat of Senegal. Penn. Syn.

CAMPAGNOL, of Buffon, is the ſhort tailed rat of Engliſh writers, Mus campaignols of Geſner, and mus arvalis of Pallas, Schreiber, &c.

CAMPAIGN ſignifies a field, an open or level country.

In a military point of view, it is uſed to denote the ſpace of time, every or each year, during which troops are kept embodied as an army, or at leaſt in a condition to ſtop, thwart, or traverſe the progreſs of the enemy.

This term is alſo employed to expreſs the number of years which an officer or ſoldier has ſerved. This officer has ten campaigns over his head, that is to ſay, he has been ten years in the ſervice: this ſoldier has made ſixteen campaigns, that is, he has ſerved ſixteen years.

It is likewiſe made uſe of to ſignify the operations of a campaign. Thus we ſay, he wrote the hiſtory of that campaign; by which we mean to ſay, that he wrote the hiſtory of the tranſactions and operations that took place during that campaign. A general is ſaid to begin or open the campaign when he commences his operations.

The genuine object of a campaign is to attack your enemy, or to defend yourſelves, or to ſuccour an ally; and whichever of theſe be the object, it is neceſſary to have armies more or leſs numerous, money to pay them with, and to defray the other expences attending it, and conſiderable magazines of every ſort near the frontiers, where the armies are to aſſemble and operate. The general plan of a campaign is the reſult of political deliberation and arrangement, and is regulated by circumſtances and conjunctures.

Though campaigns may have different objects, as well as be opened and carried on at different times and ſeaſons, they may all be conſidered as falling under the following diſtinctions or denominations:

Offenſive campaigns.
Defenſive campaigns.
Summer campaigns, and
Winter campaigns.

In an *offenſive war*, you ought to conſider whether it is beſt to act offenſively every where, or to act on the defenſive in one quarter, to enable you to act with more vigour and effect in another. It is moſt adviſable to attack a country of which the conqueſt has a tendency to lead to a ſpeedy peace, or at leaſt to prove favourable to the opening of the next campaign. But it is of importance, before you undertake any ſuch enterpriſe, to know to a certainty that the powers, whoſe jealouſy you might excite, will not oppoſe the conqueſt you intend to make.

In a *defenſive war*, you ought to conſider what frontiers it is of moſt conſequence to defend. When you are inferior to the enemy, and find it difficult to defend your country with ſmall armies, you ſhould take care not to divide your force, but to keep your troops together in thoſe quarters where you have moſt to fear, in order to engage him with all your force, ſhould you be under the neceſſity of fighting him. Such conſiderations may ſometimes determine you to abandon one tract of country, and lay it waſte, in order to preſerve and protect another of greater importance.

When your object is to ſuccour or aſſiſt an ally, either in virtue of a treaty concluded with him, or to prevent his being ſubdued by ſome formidable power that wiſhes to invade his country, and ſtrip him of his territories, you ſhould, in the firſt inſtance, have ſome ſtrong and ſecure places of his put into your hands to prevent his making a peace without your participation and concurrence, and to keep open a ſafe retreat for you, ſhould you be forced to retire.

In every ſituation and ſpecies of warfare, either in commencing or continuing it, you ought not to enter on a campaign but after much and mature deliberation. You ſhould weigh every circumſtance, conſider what may happen, and ſuppoſe even the worſt, that you may not be ſurpriſed by incidents or events, but benefit by ſuch as are favourable, and ſpeedily remedy thoſe that are otherwiſe.

You ſhould not inveſt more than one perſon with the chief command of an army. For perſons who enjoy equal authority are generally of different ſentiments and opinions; and although no inconvenience aroſe to the allies from the coequal and joint command of prince Eugene and John duke of Marlborough, which was owing principally to the prudence and great good ſenſe of the latter, and to a magnanimity of mind natural to both, yet it ought not to be quoted as an example for imitation.

You ſhould keep your preparations as ſecret as poſſible, and endeavour to open the campaign with ſome blow or enterpriſe of importance, not ſuſpected by the enemy; and when you act in concert with allies, you ought to arrange and ſettle with them a general plan, that your ſucceſs may be thereby rendered more certain and rapid, and that the operations of the different armies may be ſo regulated and conducted, particularly in reſpect of time, which governs in the affairs of war, as to be conducive to the bringing about of the ſame object or end.

When a general is appointed to act, either offenſively or defenſively, it is neceſſary for him to have an exact knowledge of the ſituation, condition, and nature of the frontier and country where he is to act, to be able to ſettle properly a particular plan for the campaign. His conduct or management of a *campaign* is his manner of executing the plan of operations offenſive or defenſive, that he has formed.

The general maxims for a campaign of *offenſive* operations are chiefly the following:

To undertake no enterpriſe without mature deliberation.

To obſerve profound ſecrecy; as the beſt plans and deſigns are thoſe which the enemy is not only ignorant of, but does not even ſuſpect.

After an enterpriſe is once reſolved on, to carry it as ſpeedily into execution as poſſible.

To undertake no enterpriſe raſhly, but to conſider well the poſſible ways and means of executing it, and to be prepared to overcome with prudence and reſolution the probable obſtacles you may meet with in the execution.

Before you undertake any thing, to form magazines in different ſituations near your army, and to procure the means of tranſporting them with facility from one place to another.

When you penetrate into an enemy's country, to advance gradually rather than leave ſtrong fortreſſes behind you, and not to move unneceſſarily to a diſtance from navigable rivers convenient for the tranſport of ammunition and proviſions.

Not to enter on any enterpriſe without ſecuring a communication with your depots, and eſtabliſhing a protection for your convoys.

On entering an enemy's country to make the natives and people believe that your force is much greater than it really is, by undertaking as many enterpriſes at once as you can with ſucceſs and ſafety.

To eſtabliſh and ſtrengthen yourſelf in ſome advantageous poſition as a central poſt, from which you can ſupport all your ſubſequent movements.

To ſtudy the courage, talents, and diſpoſition of your officers and ſoldiers, to know which of them are fitteſt for one ſort of ſervice or enterpriſe, and which for another.

To take care to give your orders in writing, always when you can, as clearly and conciſely as poſſible.

To render the condition and ſituation of the troops as pleaſant and comfortable as you are able, whilſt you make them obſerve a rigid and exact diſcipline, and inure them to exerciſe and labour.

To conciliate the eſteem and affection of your troops.

To chooſe ſuch advantageous poſitions as will enable you to ſupport and command all operations to a conſiderable extent on every ſide of them, as will force the enemy to quit his and put it in your power by ſhort, ſimple, and eaſy movements on your part to compel him to make long, tireſome, and circuitous marches.

Not to revile or reproach your troops when they happen to be beaten, but to animate them and renovate their ſpirits.

To endeavour by every method to procure exact information in regard to the enemy's force and deſigns; and, above all things, to become acquainted with the real characters, diſpoſitions, ruling paſſions, and propenſities of the generals oppoſed to you.

Theſe maxims ought alſo to be obſerved by a general who is entruſted with the conduct or management of a defenſive campaign. There are a few others, however, peculiar to it, which it may not be improper to take notice of.

He ſhould endeavour to diſcover on what part of the frontier the enemy intends to aſſemble his troops, and of the object he has in view, by the ſituations, number, and nature of his depots; to put himſelf in a condition to oppoſe and fruſtrate his deſigns by proviſioning and furniſhing with ſufficient ſupplies the places that are moſt important and moſt expoſed, by reconnoitring good and ſtrong poſitions, and by taking every poſſible meaſure to prevent anticipation on the part of his opponent.

A general acting defenſively ſhould avoid an engagement where ſuperiority in numbers is of much avail; and, on the other hand, he ought to embrace any favourable opportunity of fighting the enemy in a ſituation where diſpoſition is every thing, and number nothing.

He ought himſelf to be active, vigilant, bold, enterpriſing, and capable of enduring fatigue.

He ſhould endeavour, by every ſtratagem, to draw the enemy into diſadvantageous and dangerous ſituations, where he can attack him with advantage, and without much riſk of loſing many men.

He ought not to occupy any poſition which the enemy can ſurround or ſhut him up in.

He ſhould, where it is neceſſary, ſecure his camp with intrenchments, placing his flanks out of the reach of inſult.

A general who has made ſome conqueſts, comes to be on the defenſive when he is ſtopped in his career of victory. He ſhould, therefore, ſeriouſly conſider whether he is able to keep or preſerve them, and what meaſures he ought to adopt for that purpoſe. For it is ſometimes eaſier to make conqueſts than to retain them after they are made.

When a general is on the defenſive, it is a material conſideration for him to be able to foreſee in good time and determine where he ſhall retire to, in order to take up his winter quarters, and to poſſeſs himſelf of every thing that can contribute to enſure their tranquillity. If, at the cloſe of a campaign he finds he has but little or no country left him to defend, no allies, with whom he can take refuge, or from whom he can receive ſuccour or ſupport, and that his means of repulſing the enemy are exhauſted, it is beſt for him to demand an armiſtice, and to open negociations for peace.

The cloſe, end, or concluſion of a *campaign* is the time when the oppoſing armies go into winter quarters. Sometimes one of them remains in the field longer than the other, but they generally both retire from it at the ſame time.

*Summer campaigns*. Almoſt all campaigns are made in ſummer, and none in winter, except in caſes of neceſſity, or when great and important advantages are expected to be derived from them.

Campaigns are generally opened in the ſpring; but ſome nations are later in opening them than others. In this reſpect ſome are neceſſarily regulated by climate, while others are governed by cuſtom.

It has been cuſtomary for moſt of the nations of Europe to open their campaigns in the month of March. The Turks are always later than them in taking the field, and quit it ſooner. This is owing to the great extent of country from which they have to collect their militia, their great number of cavalry, for which they muſt have paſture, and the immenſe quantites of baggage they carry along with them.

Moſt generals have endeavoured to take the field as ſoon as they were in readineſs for entering on the campaign, or as circumſtances would permit. But the celebrated and very ſucceſsful marſhal Saxe was an advocate for taking the field late in the ſeaſon. On this ſubject he expreſſes himſelf in theſe words:

"Many perſons are of opinion that it is advantageous to take the field early; in which they judge very properly, provided there is any important poſt to be ſeized or enterpriſe to be executed that requires it; but otherwiſe I am far from concurring with them, and think there is no occaſion for ſuch precipitate meaſures, but, on the contrary, that it is even prudent to remain in winter quarters much longer than the uſual time. The enemy's being ſuffered to lay ſiege to a place is of no ſignification, becauſe he will thereby only weaken and diſpirit his troops; and if you fall upon him towards the autumn with an army well diſciplined and in good order, he muſt infallibly be ruined. I have always remarked that a ſingle campaign reduces an army one-third at leaſt, and ſometimes one-half, and that the cavalry, in particular, is in ſo wretched a condition by the beginning of October, as to be no longer able to keep the field."

*Winter campaigns,* are campaigns carried on in winter.

There are ſome countries in which the climate is ſo ſevere, and the froſt ſo intenſe, that it is impracticable to make campaigns in them in winter. But in others, where they are practicable, in conſequence of the mildneſs of the climate, there are circumſtances that ſometimes render them neceſſary, and point out ſuch great advantages to be derived from them, though very diſtreſſing and injurious to troops, that a general does not much heſitate about undertaking them.

If an enemy has taken up his winter-quarters in one of your provinces or diſtricts of country, with the intention of invading a neighbouring or adjoining province early in the ſpring; and you underſtand that his cantonments are much ſcattered or extended, and think you can approach them without his being appriſed of your deſign in ſufficient time to collect his force, beat them up in ſucceſſion or detail, and diſperſe his army, obliging him to retire and abandon that tract of country, you ought to open a winter-campaign for the accompliſhment of ſuch an object.

There are but few circumſtances or conſiderations, however, that will juſtify the opening of a winter-campaign, which ought not on any account almoſt to be made in a country where there are many ſtrong places, which cannot be reduced but by long and tedious ſieges.

Frederic II. king of Pruſſia, who made more winter-campaigns than any other general of the laſt century, in ſpeaking of them expreſſes himſelf in the following words:

"Winter-campaigns are the ruin of your troops, not only on account of the ſickneſs they occaſion, but becauſe from your continual motion they can neither be clothed nor recruited. The ſame want of repoſe prevents all your carriages, &c. from being properly repaired, and ends in their total deſtruction.

"Nothing can be more certain than that the beſt army in the world cannot long ſupport ſuch campaigns; for which reaſon winter expeditions ought by all means to be avoided; not but that there is a poſſibility of a general being ſo circumſtanced as to be obliged to have recourſe to that kind of ruinous war."

CAMPAN, in *Geography*, a town of France, in the department of the Higher Pyrenées, and chief place of a canton, in the diſtrict of Bagnères, ſeated in a valley, which derives from it its name; 1 league S. of Bagnères-en-Bigorre. The place contains 4,200, and the canton 7,224 inhabitants; the territory includes 250 kiliometres, and 7 communes.

CAMPANA, a town of Naples, in the province of Abruzzo Ultra; 8 miles S.S.E. of Aquila.—Alſo, a town of Naples, in the province of Calabria Citra; 9 miles S. W. of Cariati.—Alſo, a ſmall iſland in the South Pacific Ocean, near the weſt coaſt of South America. S. lat. 48° 50′. W. long. 77° 51′.—Alſo, a river of South America, which runs into the Pacific Ocean. S lat. 48° 50′. W. long. 77° 41′.

CAMPANA, *La*, a town of Spain, in the country of Seville; 13 miles W. of Ecija.

CAMPANA *Floræ*, in *Botany*, a name given by Helwing, and ſome other of the German authors, to the plant we call *pulſatella*, or the *paſque flower*. It was named *campana Floræ*, or Flora's bell, by Helwing, becauſe of its being the ſignal of the approach of ſpring. In the Linnæan ſyſtem, this is a ſpecies of the ANEMONE.

CAMPANACEI, the thirty-ſecond natural order in the Philoſophia Botanica of Linnæus, and the twenty-ninth of the Poſthumous Lectures publiſhed by Giſeke. It contains the following genera: *Evolvulus*, Convolvulus, Ipomea, *Retzia*, *Falckia*, Polemonium, Campanula, *Canarina*, Roëlla, Phyteuma, Trachelium, Jaſione, Lobelia, Viola, *Parnaſſia*. Thoſe printed in Italics are not mentioned in the Philoſophia Botanica. None of them are arboreous; few ſhrubby; in all, the leaves are alternate, the calyx five-cleft, the corolla five-cleft, the ſtamens five, the ſtyle one (except in evolvulus, in which it is not certain whether it has four ſtyles, or one ſtyle with four ſtigmas,) and the pericarp a capſule. They are all lacteſcent, at leaſt when young and tender, and have a purgative ſlightly poiſonous quality; they have all a common character, but it is not poſſible to give them an excluſive one by which they may be diſtinguiſhed from all others.

CAMPANARIO, in *Geography*, a town of Spain, in New Caſtile; 10 miles from Paluccio-del-Rey.

CAMPANELLA, THOMAS, in *Biography*, a philoſopher of Italy, prompted by his genius to bold innovations, and remarkable for the ſufferings occaſioned by them, was born at Stilo, a village of Calabria, in 1568, and diſtinguiſhed himſelf, at a very early period, by his talents and application. At the age of 14 years he wrote verſes with great facility; and in his 15th year he entered into the order of the Dominicans. Having acquainted himſelf betimes with the ſcholaſtic theology of the age in which he lived, he directed his attention with great ardour to the ſtudy of philoſophy; and diſſatisfied with the opinions of Ariſtotle and other ancient philoſophers, becauſe, as he ſays, he did not find them conformable to the great volume of nature, he imbibed the bold and free ſpirit of inquiry manifeſted by Teleſius, in a work "On the Nature of Things," which then engaged much attention in Italy. Accordingly he publiſhed, at Naples, in 1591, a defence of this work in direct oppoſition to the philoſopoy of Ariſtotle, under the title of "Philoſophia Senſibus demonſtrata," or, Philoſophy demonſtrated to the Senſes. His determined oppoſition to long eſtabliſhed tenets, and his contempt of the authority of Ariſtotle, excited prejudices againſt him among his monaſtic brethren. Nevertheleſs, as he had ſome powerful patrons, he perſevered in his deſign of attempting the reformation of philoſophy: and he wrote two treatiſes, one "De Senſu Rerum," on ſenſation; the other, "De Inveſtigatione," on inveſtigation; thus propoſing to direct young perſons in the acquiſition of the knowledge of things, by a more eaſy and effectual method than that which had been taught by Ariſtotle or Plato. However, he was at length under a neceſſity of ſaving himſelf from inſult and perſecution by removing from Naples to Rome, and afterwards to Florence, Venice, Padua, and Bologna. At this latter place all his papers were clandeſtinely taken away and ſent to the inquiſition at Rome. At laſt he ſettled in his native country, and with a view of diſguiſing his innovations, wrote in defence of the See of Rome. In 1599 he was ſuſpected of entertaining hoſtile deſigns againſt the Spaniſh government, and of making himſelf maſter of the Higher Calabria; and committed to priſon at Naples, under a charge of high treaſon. He was ſeven times ſubjected to the torture, and during his confinement he was, for a conſiderable time, debarred the privilege of reading and writing, and of all intercourſe with his friends. Among other accuſations alleged againſt him, he was charged with having written a book, entitled "De Tribus Impoſtoribus," which, as he himſelf ſays, had been printed 30 years before he was born; when the rigour of his confinement was ſo far abated, that he was allowed to write and to correſpond with his learned friends, he compoſed ſeveral books, which were publiſhed in Germany. Many attempts were made for his liberation; and, at length, in 1626, pope Urban VIII. prevailed upon Philip IV. of Spain, to acquit him from the charge of treaſon, and he was removed to the priſon of the inquiſition at Rome, where he was confined under a pretext of hereſy till the year 1629, when he was finally liberated, after an impriſonment of about 30 years. The pope, who was a patron of learned men, in conſideration of his ſufferings, granted him a penſion, together with the title of his domeſtic. But here he was ſtill purſued by the reſentment of the Spaniards, and, therefore, the pope warned him of his danger, and aſſiſted him to make his eſcape to France, where he experienced the favour of cardinal Richelieu, who procured for him a penſion from Louis XIII. At Paris he lodged in the Dominican convent of St. Honore, and was much reſpected by men of learning, who ſought his converſation. This happy change in his ſituation was of no long continuance, for he died in 1639, as ſome have ſaid, from the imprudent uſe of antimony.

Campanella was much more diſtinguiſhed by the fertility of his imagination than by the ſoundneſs of his judgment. In this latter reſpect he was notoriouſly deficient, as many of his reveries ſufficiently evince. Beſide the credit which he gave to the art of aſtrology, and to a variety of ſupernatural cures, ſome of which reſemble thoſe of the Meſmerians or Magnetiſers of a later period, he fancied that demons appeared to him, and in a ſtate between ſleeping and waking, warned him of any threatening dangers. But, notwithſtanding the eccentricity of his genius, and his childiſh credulity, he had his lucid and happy intervals, in which he reaſoned more ſoberly. The extent of his erudition appears from his numerous writings, and particularly from his treatiſe "De Recta Ratione Studendi," or, on the right method of ſtudying; in which he pronounces judgment on a number of authors in philoſophy, poetry, oratory, hiſtory, theology, medicine, and mathematics, and lays down excellent rules for the proſecution of philoſophical ſtudies, and the knowledge of nature, which he propoſes to deduce from obſervation and experience. Many of his own opinions, however, on dialectics, phyſics, and ethics, were unintelligibly abſtruſe, and expreſſed with great obſcurity. Whilſt it ſeems to have been his aim to recede as far as poſſible from the ſyſtem of the Peripatetics, his own logic abounds with ſubtle diſtinctions, uſeleſs terms, and obſcure rules, which are not eaſily comprehended. Concerning nature, his leading doctrines were, that ſenſe is the only guide in philoſophy; that ſpace is the firſt incorporeal ſubſtance, immoveable, and the receptacle of all bodies; that time is the ſucceſſive duration of things, and only meaſured by motion; that heat and cold are the two principles, which act on the maſs of matter, the heavens having been produced by the former from rarefied matter, and the earth by the latter, from matter condenſed; that the ſun and earth are the two elements, whence all things are produced; that all animal operations are produced by one univerſal ſpirit; that all things in nature are endowed with feeling and perception; that the world is an animal or ſentient being, inſpired by a ſoul, by which it is directed, as man is by the divine principle within him; that the firſt, greateſt, and only true being, in whom power, wiſdom, and love exiſt as primary principles, tranſmits his inexhauſtible ideas by means of the active cauſes, heat and cold, to the corporeal maſſes, ſupported in ſpace, the baſis of the world, which itſelf has its ſtability in God; that all creatures are excellent in proportion to the degree in which they bear the image of eſſential principles of the divine nature; and that human depravity conſiſts in the loſs of this image, and human perfection in its reſtoration. His works contain a variety of other articles, which are very fanciful and obſcure. It redounds, however, in no ſmall degree to the praiſe of Campanella, that he expoſed the futility of the Ariſtotelian philoſophy, and that he wrote an apology for Galileo, with a defence of his ſyſtem. His acuteneſs in the ſcience of politics is diſplayed in his "Political Aphoriſms," and in his book "De Monarchia Hiſpanica;" but his principles reſemble thoſe of Machiavel. Whilſt he profeſſed to be a reformer in philoſophy, he was deſtitute of that ſober and ſound judgment, which was neceſſary for producing any very important and permanent effect. He was accuſed of impiety; but he ſeems to have been rather a fanatic and enthuſiaſt than an atheiſt. He was alſo accuſed of ſuggeſting cruel meaſures againſt the proteſtants, and, as Moſheim ſays, not without reaſon. Brucker's Hiſt. of Philoſ. by Enfield, vol. ii. p. 529. Moſh. Hiſt. vol. iv. p. 164.

Campanella, in *Geography*, a cape on the coaſt of Italy, nearly ſouth from the city of Naples, acroſs the gulf, of which it is the moſt ſoutherly point. The iſland of Cabrita lies to the weſt of it. See Cabrita.

CAMPANIA, now Campagna, in *Ancient Geography*, the moſt pleaſant and fertile province of Magna Græcia, deſcribed by the ancients under the appellation of "Regio Felix." It extended from the N.W. to the S. E. along the Mediterranean; and was bounded on the N.W. by Latium, on the S.E. by Lucania; and ſeparated from Samnium by a chain of mountains. Its principal mountains were Meſſicus, Gaurus, and Veſuvius; its lakes were the Avernus and Lucrinus; its rivers the Savus, Vulturnus, Clanis, and Silarus, which ſeparated it from Lucania. Capua was conſidered as its capital; beſides which it had ſeveral other conſiderable towns. See Campagna.

CAMPANIAN *diſeaſe*, *Morbus campanus*, in *Antiquity*, is variouſly explained by modern writers. Some will have it only a ſort of tubercles, or warts, on the face, to which the people of Campania were liable. Others maintain it to be the venereal diſeaſe; and hence draw an argument againſt the ſuppoſed novelty of that malady. Dacier will have it to be ſomething ſtill worſe; the Campanians, it ſeems, were addicted to a ſort of commerce too abominable to be named, *ore morigeri erant*. Whence it is, Plautus repreſents them as more pathic or paſſive than the Syrians themſelves. Hor. Stat. v. lib. 1. ver. 62. cum not. Dacier.

CAMPANIFORM, or Campanulated, in *Botany*, a denomination given to flowers in their form reſembling a bell.

CAMPANILE, in *Architecture*. This word, derived from *Campana*, Ital. a bell, is particularly uſed to denominate the bell towers which it is cuſtomary in Italy to erect, not like our ſteeples upon the churches, but detached from them.

Theſe edifices ornament moſt of the Italian towns, and are many of them remarkable for loftineſs and magnificent decoration. Of theſe, the campanile of Cremona is the moſt celebrated: this ſtructure is 395 feet in height, including the croſs; a ſquare tower riſes 262 feet, which is ſurmounted by two octagon ſtories, open to the air, and ornamented with columns; a conical ſhaft and a croſs terminate the elevation. The campanile of Florence is a tower of 267 feet high, on a baſe of 45 feet ſquare, entirely encruſted with marble of various colours. It was built from the deſigns of Giotto, and in ſpite of the veſtiges of a barbarous taſte which it exhibits, muſt be admired for its richneſs and workmanſhip.

Great elevation combined with narrowneſs of baſe has occaſioned, in ſeveral of theſe buildings, conſiderable ſettlements, and remarkable deviations from the perpendicular. This effect is ſenſible in the campaniles of Ravenna, Padua, and St. Agnus at Mantua, but particularly in thoſe of Bologna and Piſa. The campanile of Bologna, which is called the tower of Gariſendi, built in 1110, is 153 feet in height, and varies eight feet and a half from the perpendicular. It has been often aſſerted, that the tower was purpoſely ſo conſtructed, by the caprice of the architect; however, the interior of the building, the tables of the windows, and even the ſcaffolding holes, have all the ſame inclination, which ſeems ſufficiently to prove it to be owing to the ſinking of the ground. The durability of this tower is owing to its conſtruction with bricks, and an excellent cement, which ſeems to unite the whole into one maſs. The neighbouring tower, called *Degli Aſinelli*, has an elevation of 320 feet, and an inclination of three feet and a half, but the overhanging of the firſt is ſo remarkable, that this is not perceived.

The campanile of Piſa, called *Torre Pendente*, is, however, the moſt extraordinary of theſe. Its form, which is neither of a bad proportion, nor ill decorated, is a cylinder ſurrounded with eight ſtories of columns placed over one another, having each its entablature: the laſt ſtory, which forms the belfrey, retires from the general line of elevation. All the columns are of marble, and ſeem to have been taken from the ruins of ancient edifices; each column carries the ſpringing of two arches, and there is an open gallery between the columns and the circular wall of the tower.

The height to the platform is 150 feet, and a plumb line lowered thence to the ground falls nearly 13 feet beyond the baſe of the building.

CAMPANO, Gianantonio, or John Anthony, in *Biography*, an eminent Italian philologiſt, was born in Campania, in 1429; and from the obſcure condition of a ſhepherd, became a diſtinguiſhed ſcholar and writer. At Naples he enjoyed the benefit of Lorenzo Valla's inſtruction; and at Perugia, having in his 23d year applied to the ſtudy of the Greek language, he was advanced to the office of profeſſor of eloquence, which he occupied with great applauſe. In 1459, he attached himſelf to the Roman court, and ingratiated himſelf with pope Pius II. to ſuch a degree, that he was created by him, firſt, biſhop of Crotona, and then of Teramo. At Rome he aſſiſted Udalric, called Gallus, the firſt printer who ſettled there, in preparing MSS. for the preſs, and correcting them when printed, and writing prefaces for ſeveral of his editions. In 1471, he was deputed by Paul II. to the congreſs of Ratiſbon, held for the purpoſe of framing a league among the Chriſtian princes againſt the Turks; on which occaſion he employed himſelf in collecting ancient MSS., which he ſent into Italy. Campano was raiſed ſucceſſively by Sixtus IV. to the governments of Todi, Foligno, and Citta di Caſtello. But as he remonſtrated with the pope on the calamities which the inhabitants of the latter place ſuffered, when it was beſieged by his troops, he was deprived of his government; and withdrawing from the eccleſiaſtical ſtate, he repaired to the court of Naples. But being diſappointed of the preferment which he expected, he retired to Teramo, where he cloſed his life, in 1477. His various works, conſiſting of political and moral treatiſes, orations, letters, eight books of Latin poems, and the Hiſtory of Andrew Braccio, were publiſhed by Michael Ferno; and a new collection of them was edited at Leipſic by Mencken in 1707 and 1734. Gen. Dict. Tiraboſchi.

Campano, *Novareſe*, a diſtinguiſhed Italian geometer and aſtronomer, flouriſhed in the time of Urban IV., to whom he was chaplain, in the 13th century. He wrote Commentaries on Euclid, and he is ſaid to have tranſlated Euclid into Latin from the Arabic verſion; but Tiraboſchi aſcribes this tranſlation to Adelard, an Engliſh monk. He alſo wrote a treatiſe on the quadrature of the circle.

Several aſtronomical works of his compoſition, which treat of the motions of divers planets, or the inſtruments neceſſary for obſerving them, on the eccleſiaſtical computation, and on the theory of the planets in general, exiſt in MS. in various libraries. Tiraboſchi.

CAMPANOLOGIA, from *campana*, *bell*, and λογος, *ſcience*, the art or ſcience of ringing of bells.

CAMPANULA, in *Botany*, (Lat. a little bell.) Linn. gen. 218. Tourn. Tab. 37. Schreb. 290. Gært. 586. Tab. 31. Willd. 329. La Marck. Illuſt. 345. Tab. 123. Juſſ. p. 164. Vent. vol. ii. p. 470. Claſs and order, *pentandria monogynia*. Nat. Ord. *Campanaceæ*, Linn. *Campanulaceæ*, Juſſ.

Gen. Ch. *Cal.* perianth ſuperior, five-cleft, Linn. Gært. Lam. (in ſome ſpecies ten-cleft; five of the ſegments reflexed, and covering the capſule, Juſſ.) *Cor.* monopetalous, bell-ſhaped, five-cleft, ſhrivelling; ſegments broad, acute, ſpreading. *Nectary* in the bottom of the corolla; compoſed of five, acute, connivent valves, covering the receptacle. *Stam.* five, capillary, very ſhort, inſerted on the tips of the valves of the nectary; anthers longer than the filaments, erect. *Piſt.* germ inferior, angular; ſtyle thread-ſhaped, generally longer than the ſtamens; ſtigma two, three, or five-cleft, oblong, thickiſh; ſegments revolute. *Peric.* capſule inferior, angular; either top, egg, or priſm-ſhaped; two, three, or five-celled; in moſt ſpecies emitting the ſeeds at as many lateral holes as there are cells; in a few, opening by valves. *Seeds* numerous, ſmall, adhering to a columnar receptacle.

Eſſ. Ch. *Cor.* bell-ſhaped, cloſed at the bottom by valves bearing the ſtamens. *Stigma* two, three, or five-cleft. *Capſule* inferior; two, three, or five-celled.

*Obſ.* What Linnæus calls the valves of the nectary are conſidered by Gærtner, Juſſieu, and La Marck, ſimply as connivent dilatations of the filaments, forming a kind of vault over the receptacle. Dr. Smith drops the idea of a nectary, and ſays, that the bottom of the corolla is cloſed by ſtameniferous valves.

* *Calyx* five-cleft. *Capſules* top or egg-ſhaped.

† *Leaves* almoſt ſmooth, not harſh to the touch.

Sp. 1. C. *ceniſia*, Linn. Sp. Plant. Supp. p. 1669. Willd. 1. Mart. Mil. 1. Lam. Enc. 1. Illuſt. 2489. Allion. Ped. 35. Tab. 5. f. 1. Hall. Helv. n. 696. "Stems one-flowered; leaves egg-ſhaped, entire, ſomewhat ciliated." *Root* perennial, creeping, often a foot long, fibrous. *Stems* ſimple, ſmall, weak, about two inches high. *Root-leaves* about an inch long, roundiſh-ſpatule-ſhaped, entire, nearly ſmooth. *Stem-leaves* oblong-egg-ſhaped, ſlightly hairy, ſeſſile. *Flower* blue, terminal, large in proportion to the ſize of the plant; *calyx* rough, with ſhort, white hairs. A native of the Alps about mount Cenis, introduced into England in 1755, by Dr. Fothergill and Dr. Pitcairn. 2. C. *veſula*, Willd. 38. Mart. 69. Lam. Illuſt. 2490. Allion. pedem. n. 397. Tab. 7. fig. 1. "Stem one-flowered, nearly naked; leaves ſmooth, oval, toothed; calyx ſmooth." *Root* perennial. *Stem* about ſix inches high, round. *Root-leaves* numerous, petioled, decurrent, acute, nerved beneath. *Calyx* cleft beyond the middle. *Corolla* ſpreading. Found by Allioni at the foot of mount Veſulo in Piedmont. 3. C. *Bellardi*, Willd. 3. Mart. 68. Lam. Illuſt. 2491. Allion. Ped. n. 396. Tab. 85. fig. 5. "Stem one-flowered, nearly naked; leaves petioled, elliptic lanceolate, toothed." *Root* perennial. *Stem* an inch and a half high, erect, rather firm, round, ſmooth. *Leaves* drawn to a point at each end, deep green, roughiſh, firm, and not juicy. *Flower* blue, upright; *calyx* ſmooth, cleft beyond the middle; ſegments lanceolate-linear, not expanded. A native of Piedmont. 4. C. *uniflora*, Linn. Sp. Pl. 1. Flor. Lap. Tab. 9. fig. 5, 6. Willd. 2. Mart. 2. Lam. Enc. 2. Illuſt. 2492. "Stem one-flowered; calyx equalling the corolla." *Root* perennial. *Stem* ſimple, about three inches high, upright. *Root-leaves* oblong-egg-ſhaped, obtuſe; *ſtem-leaves* longer, lanceolate-linear. *Flower* blue, terminal, nodding. The whole plant ſlightly hairy. A native of mountains in Lapland. 5. C. *hederacea*, Linn. Sp. Pl. 38. Willd. 82. Mart. 53. Lam. Enc. 5. Illuſt. 2493. Mor. hiſt. 2. p. 456. Sect. 5. Tab. 2. fig. 18. Flor. Dan. Tab. 330. bad. Eng. bot. 73. "Leaves heart-ſhaped, five-lobed, petioled, ſmooth; ſtem flaccid." *Root* perennial, fibrous, ſmall. *Stems* procumbent, creeping, wide-ſpreading, ſlender, branched, ſmooth, leafy. *Leaves* oppoſite or alternate, tender, ſmooth, with the exception of a few ſcattered hairs. *Flowers* pale blue, terminal and axillary, nodding, ſome withering after they are gathered. *Capſule* ſmall, hemiſpherical. A native of England, Denmark, France, and Spain, in moiſt ſhady places. Linnæus, without ſufficient reaſon, ſuppoſed it a hybrid plant, from ſome campanula impregnated by Veronica hederifolia. 6. C. *cochlearifolia*, Lam. Ene. 4. Illuſt. 2494. Willd. 73. Barrel. ic. 454. "Stems ſimple, one-flowered; root-leaves roundiſh-heart-ſhaped, ſcolloped, on long petioles; ſtem-leaves ſmaller, ſomewhat ſpatula-ſhaped, acute; flower drooping." *Stems* three inches long, leafy, ſimple, weak. *Root-leaves* numerous, ſmooth, ſcarcely four or five lines broad. *Flowers* blue; *calyx* very ſhort, with five acute teeth. A native of the Italian Alps. 7. C. *Elatines*, Linn. Sp. Pl. 37. Willd. 80. Mart. 52. Lam. Enc. 5. Ill. 2495. Allion. Ped. n. 422. Tab. 7. fig. 1. Barrel. ic. 453? "Leaves heart-ſhaped, toothed, pubeſcent, petioled; ſtems proſtrate; peduncles capillary, many-flowered." *Root* perennial. *Stems* many, generally ſimple, round, pubeſcent, ſpringing from the fiſſures of rocks. *Leaves* alternate, on long petioles. *Racemes* axillary, with about three flowers, ſometimes branched. *Flowers* purple, cleft half way down; ſegments lanceolate, revolute. All the flowers have a linear bracte except the upper one. The whole plant is very milky and pubeſcent, with ſhort hairs. A native of Piedmont at the foot of the Alps. 8. C. *pulla*, Linn. Sp. Pl. 2. Willd. 4. Mart. 3. Jacq. Obſ. 1. p. 30. Tab. 18. Auſt. 3. Tab. 285. "Stems one-flowered; ſtem-leaves egg-ſhaped, ſcolloped; flower drooping." *Root* perennial, ſmall, creeping. *Stems* five or ſix inches high, ſlender, upright, zigzag; ſometimes having one or two flowering branches, each with a ſingle flower. *Root* and *ſtem-leaves* egg-ſhaped, obtuſe, petioled. *Flower* deep blue, terminal; *calyx* ſmooth. There is a variety with roundiſh leaves, and more than one flower. A native of mountains in Auſtria, Stiria, and Aragon. 9. C. *rotundifolia*, Linn. Sp. Pl. 3. Willd. 12. Mart. 4. Lam. Enc. 7. Illuſt. 2498. Curt. Flor. Lond. 4. 21. Eng. Bot. 866. "Root-leaves kidney-ſhaped; upper leaves linear." *Root* perennial, branched, ſomewhat woody. *Stems* ſeveral, from two or three inches to a foot or more in height, rather upright, but weak, round, ſmooth, milky, branched. *Leaves* ſmooth; root-leaves petioled, generally toothed, but ſometimes quite entire; ſtem-leaves near the baſe lanceolate and toothed; near the ſummit linear and entire. *Flowers* blue, ſometimes white, nodding; ſegments of the calyx linear, ſmooth, grooved, expanding horizontally when out of bloſſom; valves of the nectary fringed, pointed, white. The root-leaves from which this ſpecies, rather inconveniently, and, indeed, ſomewhat improperly, takes its name, are ſeldom obſerved, being uſually concealed among the ſurrounding graſs and leaves of other plants, and withering away as the plant advances to maturity. The juice of the flowers ſtains blue, but, with the addition of alum, produces a green pigment. It varies ſo much from ſoil and ſituation, that authors differ greatly from each other with reſpect to what are only varieties, and what are really diſtinct, though kindred ſpecies. Willdenow aſſerts, that C. *rotundifolia* of Allioni, (Flor. Ped. n. 398. Tab. 47. fig. 2.) quoted by Martyn, is certainly a diſtinct ſpecies, ſince it appears, from Allioni's figure, to be very different from *rotundifolia* of Linnæus in the form both of its leaves and of its corolla. La Marck ſpeaks of a variety which he has found in Auvergne, which differs in habit from *rotundifolia*, but, upon examination, is found to reſemble it in all its botanical characters, except that its ſtem-leaves are long lanceolate, and narrowed into a petiole at their baſe. 10. C. *pumila*, Curtis, Bot. Mag. 512. (rotundifolia β. Linn. Minor rotundifolia alpina, Bauh. prod. 34. C. puſilla, Jacq. 2. p. 79? C. ceſpitoſa, Lam. Ill. 2497. Enc. C. pulla, γ. "Root-leaves egg-ſhaped, ſcolloped; petioles flattened; flowers in unilateral racemes, drooping." A plant of much humbler growth than rotundifolia. *Root-leaves* never kidney-ſhaped; on ſhort, flattened, not thread-ſhaped, petioles; continuing during the time of flowering, and forming a mat, not diſappearing like thoſe of the preceding ſpecies; lower ſtem-leaves often of the ſame ſhape. It bears a profuſion of flowers, and being a hardy perennial, is particularly ſuited to adorn rock-work. There is a variety with white flowers. According to Curtis, the ceſpitoſa of Scopoli. (n. 225. Tab. 4.) is probably a variety. Profeſſor Martyn has taken it up as a diſtinct ſpecies, though he had before quoted it as a ſynonym under C. rotundifolia β, the pumila of Curtis. Villars, dauph. 2. 500. Hall. helv. n. 702. Bauh. Prod. 34, are alſo quoted by him under both. 11. C. *anguſtifolia*, Lam. Illuſt. 2499. "Stems many-flowered; lower leaves lanceolate, egg-ſhaped, petioled; ſtem-leaves narrow, acute, ſeſſile." A native of the ſouth of France. La Marck aſſerts that though nearly allied to rotundifolia, it is diſtinct, and refers to Gmelin, Sib. 3. tab. 33. 12. C. *ſubuniflora*, La Marck Illuſt. 2500. (Uniflora, Vill. Dauph. 2. p. 500. tab. 10. Linifolia, Willd. 13?) "Lower part of the ſtem ſomewhat hairy; loweſt leaves egg-ſhaped; upper ones narrow-lanceolate; flower terminal, erect. Small abortive flowers are found in the axils of the upper leaves." There is a variety entirely hairy, which La Marck conjectures may be C. valdenſis of Allioni (Flor. Ped. n. 400. tab. 6. fig. 1.) The valdenſis is taken up by Martyn as a diſtinct ſpecies; and C. Scheuchzeri of Villars (Dauph. 2. 503. tab. 103. taken up from Scheuch. it. 454. tab. 14. fig. 1.) is quoted as a ſynonym. Willdenow ſuppoſes the valdenſis of Allioni to be his linifolia, and C. Scheuchzeri a variety.

13. C. *pubeſcens*, Willd. 14. Schmidt. Bohem. n. 167. "Stem hairy; leaves ſmooth; root-leaves heart-ſhaped; ſtem-leaves oblong, toothed, petioled." *Root* perennial. *Stem* decumbent, angular. *Flowers* ſhort, broad. A native of rocky woods in Bohemia. 14. C. *linifolia*, La Marck Enc. 8. Ill. 2501. "Smooth; ſtem erect, many-flowered; leaves all ſeſſile; the lower ones egg-ſhaped; upper ones lanceolate-linear." *Stem* about a foot high, ſimple, ſmooth. *Leaves* almoſt entirely ſmooth; upper ones entire, acute, a little reſembling thoſe of flax. *Flowers* blue, peduncled, terminal; calyx ſmooth, with five erect, acute ſegments. Found by La Marck in great abundance in the paſtures of Mont d'Or, and, as he ſays, too diſtinct from C. rotundifolia to be confounded with it. 15. C. *diffuſa*, Willd. 81. Lam. Illuſ. 2502. Vahl. Symb. 1. p. 18. Barrel. Ic. 453. "Stems widely ſpreading; leaves petioled, ſerrate-toothed; lower ones heart-ſhaped; upper ones lanceolate; peduncles one-flowered." 16. C. *fragilis*, Mart. 76. Lam. Illuſ. 2541. Cyril. Rar. Neap. Faſc. 1, 32. tab. 11. fig. 2. (C. ſaxatilis, &c. Bar. ic. 453. Rai. Hiſt. 741. n. 21.) "Stems procumbent; branches directed one way, many-flowered; root-leaves kidney-ſhaped, ſcolloped; calyxes angular." A beautiful plant, but extremely brittle, abounding in milk, commonly quite ſmooth, bright green and ſhining, but ſometimes lanuginous. *Root* perennial, brown. *Stems* numerous, crowded, branched towards the middle, hanging down from the clefts in the rocks. *Root-leaves* crowded, petioled; ſtem-leaves alternate, lanceolate, egg-ſhaped. *Flowers* two or three from the ends of the branches; ſegments of the calyx lanceolate, acute; corolla large, bright blue, flat, with a very ſhort tube, and ſharp, deeply cut ſegments; edge of the nectary rough with hairs. A native of the kingdom of Naples, about Salerno and Amalphi, firſt obſerved by Ray, then by Barralier, and finally by Cyrilli. 17. C. *limonifolia*, Linn. Sp. Pl. 33. Willd. 74. Mart. 48. Lam. Enc. 63. Ill. 2539. (C. orientalis, limonii minimi facie, Tourn. Cor. 3.) "Branches ſpreading, undivided; root-leaves elliptical, even, entire; flowers ſeſſile, three together." *Branches* rodlike. *Root-leaves* ſmooth, petioled, not rigid; ſtem-leaves linear, or awl-ſhaped. *Flowers* remote, axillary, generally three together; bractes the length of the germ. A native of the Eaſt. 18. C. *virgata*, Martyn 77. Lam. Ill. 2540. Labillard. Syr. Dec. 2. p. 11. tab. 6. "Branches rodlike; root-leaves lanceolate, ſharp at both ends, toothed, ſomewhat rugged; branch-leaves very ſhort; flowers in pairs, ſeſſile." *Root* biennial. *Stem* upright, a foot or more high, ſtriated, with few leaves; branches ſpreading. *Root-leaves* petioled. *Flowers* remote, commonly two together, blue; bractes the length of the germ; ſegments of the calyx acute; thoſe of the corolla lanceolate, cut almoſt to the baſe. *Capſule* top-ſhaped, angular, three-celled, opening laterally with three holes. A native of mount Libanus. Nearly allied to the preceding, but differing in its deeply cut corolla, and its toothed, rather rugged leaves. 19. C. *patula*, Linn. Sp. Pl. 4. Willd. 22. Mart. 5. Lam. Enc. 9. Ill. 2503. Dill. Hort. Elt. 68. fig. 58. Flor. Dan. 373. Eng. Bot. 42. "Leaves ſtiff; root-leaves lanceolate-oval; panicle ſpreading; calyx toothed." *Root* biennial, ſlender, white. *Stem* a foot and a half high, angular, a little harſh to the touch. *Leaves* rather harſh, ſcolloped; root-leaves obtuſe, petioled; ſtem-leaves ſeſſile, alternate, acuminate, ſlightly toothed, few, diſtant. *Flowers* upright, tapering at the baſe, ſpreading at the border; ſegments of the calyx lanceolate, toothed toward the baſe. A native of Sweden, Denmark, Germany, Switzerland, Piedmont, but it does not appear to have been found in France, nor is it common in England. We have obſerved it growing, not only on the *outſide* of Buddon wood, near Loughborough in Leiceſterſhire, to which Mr. Woodward (Eng. Bot.) confines it, but alſo, and much more abundantly, *within* the wood, in its higher and more rocky part. It has alſo been gathered in ſeveral other midland counties, particularly Warwick, Worceſter, Stafford, Salop, Hereford, and Surry. 20. C. *gracilis*, Willd. 6. Mart. 67. Forſt. Prod. 15. Exot. Bot. p. 87. tab. 45. "Leaves rough, linear-lanceolate; lower ones bluntly toothed. *Stem* round, much branched. *Flowers* ſolitary, terminal; their tube ſhorter than the calyx-ſegments." *Stem* a foot or more high, leafy, two-edged. *Leaves* obtuſe; lower ones oppoſite, the reſt ſcattered. *Flowers* erect, on long peduncles; calyx globoſe, generally rough with deflexed hairs, but in Forſter's original ſpecimen ſmooth; ſegments awl-ſhaped, longer than the body; corolla ſlender, funnel-ſhaped, of a rich blue within, paler without; ſegments acute, fringed, ſometimes only four. *Capſule* three-celled, three-valved at its ſummit. Every part of the herbage rough with a ſhort rigid pubeſcence. Found by Forſter in New Zealand and New Caledonia, raiſed in England from ſeeds brought from New South Wales. 21. C. *vincæflora*, Ventenat. Jard. de Malmaiſon. 12. (Camp. gracilis, Bot. Mag. 691?) "Leaves linear-lanceolate; ſtem round, much branched; peduncles terminal, elongated, one-flowered." Ventenat ſuppoſes his plant and the gracilis of Forſter to be the ſame. Dr. Sims (Bot. Mag.) concurs with him; and there is certainly nothing in the ſpecific character, as given by Ventenat, which can lead to a different opinion; but we have kept them ſeparate, in deference to the judgment of Dr. Smith, who thinks the vincæflora a diſtinct ſpecies, being ſmooth, except ſome ſcattered longiſh briſtles on the leaves; and having a wider flower, with much ſhorter calyx-ſegments, and a leſs globular capſule. The figures in Exotic Botany and the Botanical Magazine are materially different. We have referred that in the latter, though with ſome heſitation, to Ventenat's plant, on account of its wide-ſpreading campanulate, not funnel-ſhaped, flower, which appears of itſelf to form a ſufficient ſpecific diſtinction. The teeth, or, as we ſhould rather call them, ſegments of the calyx, are repreſented in the Botanical Magazine expanding, which would form another good difference, if Dr. Sims had not in the deſcription expreſsly ſtated them to be erect. The ſmoothneſs or roughneſs of the leaves is too variable a character to be of much value. Dr. Smith ſays that the capſule of vincæfolia is leſs globular than that of his Gracilis, but in the Botanical Magazine it is evidently more ſo. Dr. Sims's deſcription differs in ſeveral reſpects from Dr. Smith's. We ſhall tranſcribe the moſt material parts, that future obſervers may be better able to determine the identity or the diverſity of the ſpecies. *Stem* ſquare, hairy, generally decumbent. *Leaves* moſtly oppoſite, toothed, ſomewhat pubeſcent. *Flowers* nodding whilſt in bud, erect when expanded; on long, ſquare, hairy peduncles; calyx egg-ſhaped, ſtriated; teeth awl-ſhaped, erect, diſtant; corolla bell-ſhaped, cut half-way down into five, ſometimes only four, egg-ſhaped, entire ſegments; nectaries or valves three-lobed; anthers oblong, diſappearing almoſt as ſoon as the flower opens; ſtyle erect; ſtigmas three, rolled back, villous. Firſt raiſed by Mr. Curtis, by ſowing the mould that came about the roots of ſome plants imported from New Holland and New Zealand. It flowers during the greateſt part of the ſummer, and is eaſily propagated by ſeeds or cuttings. 22. C. *Rapunculus*, Rampion. Linn. Sp. Pl. 5. Willd. 23. Mart. 6. Lam. Enc. 10. Ill. 2504. Gært. tab. 31. fig. 2. Eng. Bot. 283. (Rapunculus eſculentus, Rai. Syn. 277.) "Leaves waved; root-leaves lanceolate-oval; panicle contracted." *Root* biennial, ſpindle-ſhaped, white, ſweet, eſculent. *Stem* a foot and half

or two feet high, erect, angular, rough, eſpecially on the lower part with deflexed hairs. *Leaves* alternate, ſeſſile, toothed; lower ones rather hairy; upper ones ſmooth. *Bractes* awl ſhaped. *Panicle* erect; its ſide branches bearing from one to three or more flowers. *Flowers* bluiſh purple, or whitiſh; ſegments of the calyx ſometimes toothed, but not ſo much ſo as in patula; corolla inflated, not tapering at the baſe; nectary fringed. *Capſule* crowned with the lanceolate-linear ſegments of the calyx, retuſe, inverſely pyramidal-egg-ſhaped, with three nerves on each of the three blunt angles opening with three lateral holes, a little above the middle. *Seeds* numerous, ſmall, elliptical, lenticularly compreſſed, ſmooth, ſhining, of a pale ruſſet colour. Smith and Gærtner. A native of France, Switzerland, Germany, Piedmont, &c. It has been found in England, about Croydon and Eſher in Surry, old Buckenham caſtle in Norfolk, and Enville in Worceſterſhire. The fleſhy roots and the young leaves are eaten in France in ſallads, and are thought to increaſe the milk in nurſes. The roots are alſo eaten boiled. It was formerly much cultivated in England as an eſculent, but is now neglected. In the time of Parkinſon its roots were boiled till they were tender, and afterwards eaten cold with vinegar and pepper. 23. C. *perſicifolia*, Linn. Sp. Pl. 6. Willd. 26. Mart. 7. Lam. Enc. 11. Ill. 2505. (Rapunculus perſicifolius, Bauh. Pin. 93.) "Root-leaves inverſely egg-ſhaped; ſtem-leaves lanceolate-linear, ſomewhat ſerrated, ſeſſile, remote." *Root* perennial, eſculent. Whole plant, except the germ and capſule, ſmooth. *Stem* two or three feet high, erect, ſimple, angular. *Stem-leaves* ſtraight, acute, diſtant, ſlightly toothed. *Flowers* in a thin ſpike, blue, ſometimes white, on long peduncles; corolla large, broad, ſhort; bractes two to each peduncle. There is a variety found in low woods, with only two or three large flowers, and long narrow leaves. A double variety, both blue and white, is alſo common in gardens, called, in ſome parts of England, Batchelors' Buttons. A native of moſt parts of the continent of Europe. A magnificent, large-flowered variety from South Carolina, imported by Mr. Dickſon of Covent garden, and differing from the European plant only in ſize, is figured in the Botanical Magazine, *397*. It is very hardy and eaſy of culture, increaſing by its roots, which are ſomewhat creeping, and may be parted either in ſpring or autumn. 24. C. *ptarmicæfolia*, Willd. 39. Lam. Enc. 12. Ill. 2506. Tourn. Cor. 4. "Leaves all linear, toothed; ſtems ſimple; flowers erect, ſeſſile." *Stems* ſcarcely a foot high, ſmooth. *Leaves* ſcabrous at their edges with fine ſpinous teeth. *Flowers* alternate, bluiſh, forming a ſpike at the upper part of the ſtem; calyx ſhort, ſmooth; coralla oblong, ſlightly five-cleft: bractes three. Obſerved by Tournefort in Armenia. 25. C. *linarioides*. Lam. Enc. 13. Illuſt. 2507. Willd. 15. "Stem rod-like, panicled: leaves linear: flowers erect, terminal." *General habit* that of Antirrhinum linaria. *Stem* about a foot high, ſlender, ſmooth, ſlightly ſtriated, panicled at the top. *Leaves* numerous, ſcattered, minute, with a few, ſcarcely perceptible teeth. *Flowers* peduncled, ſmall: corolla deeply divided. Found by Commerſon on Monte-Video, near Buenos-Ayres, in South America. 26. C. *pyramidalis*, Linn. Sp. Pl. 17. Willd. 27. Mart. 8. Lam. Encyc. 14. Ill. 2508. (Rapunculus hortenſis: Bauh. pin. 93.) "Leaves ſmooth, even, ſerrated, heart-ſhaped; ſtem-leaves lanceolate: ſtems ruſh-like, ſimple: umbels ſeſſile, lateral." *Root* biennial, oblong, fibrous, milky. *Stems* ſeveral, near four feet high, ſmooth. *Leaves* petioled. *Flowers* blue, ſometimes white, large, open, coming out ſeveral together in lateral and terminal tufts or umbels, on ſhort peduncles: ſegments of the calyx upright, linear. Vigorous plants throw out numerous ſimple, ſhort, lateral branches. A native of Carniola. It is ſometimes cultivated in a pot, and ſet on the hearth of halls, &c. in ſummer, and by ſpreading the upright ſtems on a flat frame compoſed of ſlender laths is formed into the ſhape of a fan, which will nearly cover a common fire-place. 27. C. *americana*, Linn. Sp. 8. but not the ſynonyms which belong to the next ſpecies. Willd. 28. Mart. 9. Hort. Kew. 220. "Leaves heart-ſhaped and lanceolate: petioles ciliated: flowers unilateral; corolla five-cleft, flat." Linn. "Leaves heart-ſhaped and lanceolate, ſerrated; petioles of the lower ones ciliated: flowers axillary, ſeſſile; corolla five-cleft, flat; ſtyle longer than the corolla." Hort. Kew. *Root* annual. *Stem* and *germs* ſmooth. *Flowers* three or four from the axil of each leaf or bracte: corolla ſmall. Linn. A native of Pennſylvania, introduced into England in 1763, by Mr. J. Bartram. 28. C. *nitida*, Willd. 29. Mart. 74. Hort. Kew. 1. 221. L'Herit. Sert. Ang. (C. planiflora, Lam. Enc. 15. Ill. 2509. C. minor Americana, Herm. Lugd. 107. Trachelium minus Americanum: Dodart. Mem. 4. p. 119. tab. 118.) "Leaves oblong, ſcolloped, even; ſtem-leaves lanceolate, nearly entire; corollas bell-wheel-ſhaped. Hort. Kew. "Leaves oblong, ſcolloped, rigid, ſeſſile: flowers erect, flat." Lam. *Root* perennial. *Stems* five or ſix inches high, often ſimple, ſtraight, ſtiff, a little ſtriated. Stem-leaves ſmooth, green, gradually diminiſhing to the top of the ſtem. *Flowers* blue or white, one or two in each axil of the upper leaves: calyx ſhort; ſegments oval-acuminate. La Marck doubts whether it be ſpecifically diſtinct from C. americana, though he acknowledges that it differs from it in having no heart-ſhaped leaves, nor ciliated petioles; and in the flowers not being unilateral: the laſt circumſtance, however, is omitted in the ſpecific character of C. americana, drawn up for the Hortus Kewenſis. A native of America, deſcribed by La Marck from a living plant in the royal garden at Paris. 29. C. *ſtyloſa*, Lam. Enc. 16. Ill. 2510. Willd. 35. Gmel. Sib. 3. tab. 27. good. "Leaves petioled, ſomewhat heart-ſhaped, acutely ſerrated: flowers ſmall, nodding, ſtyle longer than the corolla." *Stem* a foot high or more, ſimple, and, like all other parts of the plant, ſmooth. *Leaves* ſcattered, acuminate, decurrent along the petiole with a ſlight membrane: bractes lanceolate and nearly ſeſſile. *Flowers* oblong, bluiſh, in a terminal panicle: border obtuſe: ſtyle very long: ſtigma club-ſhaped, ſlightly three-cleft. A native of Siberia, ſent to the royal garden at Paris, under the name of C. lilifolia. 30. C. *periplocifolia*. Lam. Enc. 17. Ill. 2511. "Leaves heart-ſhaped, obtuſely ſerrated, on long petioles: ſtems aſcending, few-flowered." Reſembling the preceding, but ſmaller, and not with upright ſtems. *Leaves* all petioled, acuminate, ſmooth, a little toothed or ſcolloped. *Flowers* terminal, pale blue, reſembling thoſe of C. ſtyloſa. A native of Siberia, cultivated in the royal garden at Paris. 31. C. *lilifolia*, Linn. Sp. Pl. 9. Willd. 30. Mart. 10. Lam. Enc. 18. Ill. 2512. Amm. Ruth. p. 11. n. 17. Gmel. Sib. 3. p. 143. tab. 26. "Leaves lanceolate; ſtem-leaves acutely ſerrated: flowers panicled, nodding." *Root* perennial. It varies in its form and ſize, and in the number and colour of its flowers; but may in all caſes be diſtinguiſhed from the two immediately preceding by its ſeſſile ſtem-leaves. A native of Siberia, from the Iaick eaſtward to the confines of China. The roots are eaten by the inhabitants boiled and raw. 32. C. *azurea*, Bot. Mag. 551. Solander MSS. in the poſſeſſion of ſir Joſeph Banks. "Leaves oblong, egg-ſhaped, ſeſſile, ſerrated: ſtem ſimple, angular: flowers panicled." Sol. *Root* perennial. *Stem* erect, quadrangular, with raiſed, ſomewhat cartilaginous angles. *Root-leaves*

*leaves* few, petioled, heart-egg-ſhaped; with a few, thinly ſcattered hairs underneath, chiefly about the margin: *ſtem-leaves* alternate, acute, thinly haired. *Flowers* blue: peduncles long, thread-ſhaped, alternate, axillary, once or twice divided; pedicels nodding, with linear bractes: calyx pentagonal. A native of Switzerland. It flowered in the botanic garden at Chelſea, in 1778. 33. C. *carpatica*, Linn. jun. Supp. p. 140. Willd. 16. Mart. 16. Jacq. Hort. 1. tab. 57. Bot. Mag. 117. "Leaves heart-ſhaped, ſerrated, ſmooth, petioled: peduncles elongated; calyx reflexed, glutinous." *Root* perennial. *Stem* herbaceous, milky, a little branched; in gardens much branched, and many-flowered. *Flowers* blue: calyx five-cleft; ſegments linear-lanceolate, acuminate, a little reflexed, beſet with glutinous glands. Mr. Curtis obſerves, that it deſerves to be better known and more cultivated, being large and ſtrong, and like many other Alpine plants, well calculated to decorate rock-work and the borders of the flower garden. A native of the Carpatian Alps. Sent to the royal garden of Kew, in 1774, by Profeſſor Jacquin. 34. C. *grandiflora*, Linn. jun. Supp. p. 140. Willd. γ. Mart. 17. Jacq. Hort. 3. p. 4. tab. 3. Bot. Mag. 252. (C. gentianoides: Lam. Encyc. 19. Ill. 2513.) "Leaves lanceolate, egg-ſhaped, ſerrated, nearly ſeſſile: branches one-flowered: flowers top-ſhaped, ſpreading: ſtigma five-cleft." *Root* perennial, white, ſpindle-ſhaped, and branched. *Stems* few, about a foot high, feeble, ſimple, or furniſhed at the ſummit with three or four ſmall branches. *Leaves* near two inches long, ſometimes growing in threes, ſmooth, bright green above, a little glaucous and finely veined beneath. *Flowers* large, of a beautiful blue, terminal, and ſometimes two or three from the upper axils, green and elegantly pear-ſhaped before expanſion, reſembling an air-balloon, whence it has ſometimes been called the balloon plant. No holes in the capſule. It was ſuſpected by the younger Linnæus to be only a variety of C. carpatica, but Jacquin determined it to be a diſtinct ſpecies. A native of Siberia and Tartary, introduced into England in 1782, by Mr. John Bell. 35. C. *rhomboidalis*, Linn. Sp. Pl. 10. Lam. Enc. 20. Illuſ. 2514. (C. rhomboidea: Mart. 11. Willd. 32. C. caule ſimplici, &c.: Hall. helv. n. 693. C. drabæ minoris folio: Bauh. p. 94. prod. 93. Rapunculus Teucrii folio: Bar. ic. 567. Bocc. Muſ. 75. tab. 61.) "Leaves rhomboidal, ſerrated; ſpike often unilateral; calyx-ſegments capillary." *Root* perennial, creeping. *Stems* from ſix to ſixteen inches high, upright, ſlender, angular, almoſt ſmooth. *Leaves* ſeſſile, ſcattered, with a few ſhort hairs. *Flowers* blue, in a ſhort, looſe ſpike: calyx ſmooth, with awl-ſhaped, entire ſegments. *Capſule* ſmall, ſcarcely three inches long, inverſely pyramidal, not egg-ſhaped, triangular; angles rounded, thick, three-nerved; interſtices narrow, depreſſed; holes juſt below the baſe of the calyx. *Seeds* ſmall, ruſſet, ſhining. Lam. and Gært. A native of Italy, Switzerland, and the ſouth of France. 36. C. *aſteroides*, Lam. Ill. 2515. "Stem angular, rod-like; leaves egg-ſhaped, acuminate, finely ſerrated, remote; flowers ſeſſile, axillary and ſpiked." *Corolla* widely ſpreading. *Calyx* reflexed. *Style* exſerted, aſcending. *Stigma* three-cleft. Cultivated by M. le Monnier at Paris; native country unknown. 37. C. *Alpini*, Linn. Sp. Pl. p. 1669. Lam. Enc. 21. Illuſ. 2516. (C. rhomboidea β.: Willd. Mart. pyramidalis minor: Alp. exot. 340.) "Leaves lanceolate, ſerrated; lower ones petioled; upper ones ſeſſile: flowers nodding: ſtyle exſerted." Lam. *Root* perennial. Larger and more branched than C. rhomboidalis, and diſtinguiſhed from it by its petioled lower leaves and long ſtyle. A native of Italy near Baſſano. 38. C. *criſpa*, Lam. Enc. 22. Ill. 2517. (C. orientalis, foliorum crenis amplioribus: Tourn. Cor. 3.) "Leaves even, petioled, ſomewhat heart-ſhaped, doubly ſerrated, gaſhed: ſtem ſimple: flowers lateral and terminal, ſpreading." *Stems* three or four, about a foot high, ſimple, round, ſmooth, rather thick. *Leaves* curled; lower ones interruptedly decurrent on long petioles. *Flowers* on ſhort peduncles; in an upright, long, leafy ſpike: corolla ſhort, very open; with five oval, rather acute ſegments: ſtigma five-cleft. Found by Tournefort in Armenia; deſcribed by La Marck from a ſpecimen in the Herbarium of Juſſieu, and from an original drawing by Aubriet. 39. C. *enſifolia*, Lam. Enc. 23. Ill. 2518. Willd. 31. "Stem ſhrubby: leaves ſword-ſhaped, ſerrated, ſmooth: flowers panicled, nodding." *Stem* in its lower part woody, ſimple or occaſionally a little branched, ſcarred with the marks of fallen leaves, and crowned with numerous cloſe-ſet leaves in a roſaceous form, which are from two to three inches long, and from four to five lines broad, ſimilar to thoſe of Yucca or Pandanus, and ſtriated with longitudinal nerves. From the midſt of theſe leaves riſes a ſmooth ſtem about ſix inches high, clothed with alternate, ſeſſile leaves, reſembling thoſe below, but ſmaller. From the axil of each ſtem-leaf ſprings a ſhort one-flowered branch furniſhed with one or two ſmall leaves, which give the whole a panicled appearance. *Flowers* drooping: calyx ſmooth. Found by Commerſon on the Volcano in the iſle of Bourbon. 40. C. *aurea*, Linn. jun. Supp. p. 141. Willd. 68. Mart. 18. Lam. Enc. p. 590. Ill. 2519. "Capſules five-celled: leaves elliptical, doubly ſerrated, ſmooth: flowers ſomewhat panicled: ſtem, ſhrubby, fleſhy." *Root* perennial. *Stems* growing cloſe to the rocks. *Calyx* coloured. Tube of the *corolla* diſtinct from the calyx: ſegments of the border reflexed. *Stigma* five-cleft. Diſcovered in the iſland of Madeira by Maſſon, and introduced at Kew in 1777. 41. C. *verticillata*, Linn. jun. Supp. p. 141. Wild. 11. Mart. 61. Lam. Enc. 24. Ill. 2520: Pallas it. vol. iii. p. 719. tab. g* fig. 1. German edition, vol. iv. p. 376. tab. 34. French Tranſlation. "Leaves five or ſix in a whorl, lanceolate, ſerrated: flowers in whirls." *Root* perennial, thick. *Stems* numerous, about a foot high, erect. *Leaves* about ſix in a whorl, nearly upright, ſtiff, ſtrongly nerved. *Flowers* blue, on the upper part of the ſtem above the whorls of leaves, drooping, many in a whorl, on ſhort peduncles: whirls about five, diſtant from each other: bractes awl-ſhaped, rather aſcending: calyx ſmall, with briſtle-ſhaped ſegments: ſtyle almoſt twice the length of the corolla. A native of Dauria. 42. C. *Zoyſii*. Willd. 5. Lam. Ill. 2521. Jacq. ic. 2. tab. 334. Hoſt. Syn. 105. "Stems tufted, few-flowered: leaves ſmooth, very entire; root-leaves petioled, roundiſh egg-ſhaped; ſtem-leaves oblong-inverſely egg-ſhaped, ſeſſile." *Root* perennial. *Stems* two or three inches high. *Corolla* cylindrical, nodding: orifice bearded. A native of rocky mountains in Auſtria. 43. C. *tenella*, Linn. jun. Supp. p. 141. Willd. 79. Mart. 19. Lam. Enc. p. 390. Ill. 2522. Thunb. Prod. (Lobelia tenella: Linn. Mant. 120. Syſt. Nat. 28. Lightfootia oxycoccoides: l'Herit. Sert. Ang. tab. 4.) "Stems diffuſe, thread-ſhaped: leaves egg-ſhaped, generally with one tooth, reflexed: flowers ſolitary, terminal." *Root* perennial. *Stems* five or ſix inches long, regularly branched; branches ſimple. *Leaves* ſmall, crowded, ſeſſile, gloſſy, obtuſe, channelled. *Flowers* ſmall, few, lateral, on ſhort peduncles near the ſummit of the branches: calyx gloſſy; ſegments acute: corolla five-cleft. Found at the Cape of Good Hope by Thunberg and Sonnerat. 44. C. *ſeſſiliflora*, Linn. jun. Supp. p. 139. Willd. 21. Mart. 57. Lam. Enc. p. 590. (Lightfootia ſubulata l'Heritier ſert. tab. 5. ?.) "Stem proſtrate; leaves linear-awl-ſhaped, entire; flowers axillary, ſolitary, ſeſſile." Found by Thunberg at the Cape of Good Hope. 45. C. *faſciculata*, Linn. jun. Supp. p. 139. Willd. 25. Mart. 58. Lam. Enc. p, 590. Ill. 2524, "Stem ſhrubby; leaves ſmall, egg ſhaped, with one or two teeth, recurved; flowers glomerated, terminal." Found by Thunberg and Sonnerat at the Cape of Good Hope. 46. C. *Lobelioides*, Linn. jun. Supp. p. 140. Willd. 17. Mart. 15. Lam. Enc. p. 590. Ill. 2525. "Stems round, ſtiff, and ſmooth; leaves linear-lanceolate, toothed; corolla funnel-ſhaped." *Root* annual. *Stems* much branched. *Leaves* ſeſſile. *Flowers* very ſmall, pale purple; calyx with three or five egg-ſhaped, obtuſe diviſions; corolla twice as long as the calyx; tube round, gradually widened; ſegments of the border three or five, erect; ſtamens three or five. *Capſule* two-celled. In general habit, tenderneſs, mode of diviſion and infloreſcence it reſembles a Lobelia, Linn. jun. Found by Maſſon in the iſland of Madeira; introduced into England in 1777. 47. C. *poroſa*, Linn. jun. Supp. p. 142. Willd. 18. Mart. 20. La Marck Enc. p. 590. Thunb. prod. 39. "Root-leaves inverſely egg-ſhaped; ſtem-leaves lanceolate; ſtem rough, with points; flowers in racemes." This plant is diſtinguiſhed by the minute pores on the ſtem, which are directed not downwards but upwards. *Stem* about a foot high, round; branches numerous, upright, ſhort. *Flowers* ſmall, a little nodding; calyx half the length of the corolla, even; ſegments lanceolate. 48. C. *undulata*, Linn. jun. Supp. p. 142. Willd. 19. Mart. 21. Lam. Enc. 590. "Leaves lanceolate, toothed, waved; flowers nearly ſolitary, peduncled." *Stem* a foot and half high, upright, ſlender, ſmooth, a little branched near the top. *Leaves* ſeſſile, a little decurrent, reflexed at the edges, repand, nearly even. *Flowers* the ſize of thoſe of rotundifolia; calyx even; ſegments ſhort, acuminate. 49. C. *capillacea*, Linn. jun. Supp. p. 139. Martyn 13. "Herbaceous, upright; leaves thread-ſhaped, ſmooth; panicle terminal; flowers alternate; capſules ſmooth." 50. C. *linearis*, Linn. jun. Supp. p. 140. Willd. 20. Mart. 14. "Herbaceous, upright; leaves linear, entire, ſmooth; flowers drooping; calyx the length of the corolla; capſule hiſpid." 51. C. *unidentata*, Linn. jun. Supp. p. 139. Willd. 24. Mart. 12. "Stems upright, ſimple, ſmooth; leaves lanceolate, ſmooth, with one tooth on each ſide; panicle divaricated, leafy." 52. C. *adpreſſa*, Linn. jun. Supp. p. 139. Willd. 47. Mart. 60. "Stem herbaceous, upright; leaves lanceolate, toothed, recurved, ciliated at the baſe, preſſed cloſe to the ſtem; panicle twice compound." 53. C. *procumbens*, Linn. jun. Supp. p. 141. Willd. 78. Mart. 62. "Stem dichotomous, diffuſed; leaves inverſely-egg-ſhaped, ſcolloped, obtuſe; flowers ſolitary, erect." 54. C. *cinerea*, Linn. jun. Supp. p. 139. Willd. 51. Mart. 26. Thun. Prod. 38. "Leaves lanceolate, waved, hairy, entire; ſtem angular, hiſpid; flowers in racemes." The laſt eight were found by Thunberg at the Cape of Good Hope. 55. C. *triphylla*, Willd. 10. Mart. 63. Thunberg, flor. jap. 87. "Leaves by threes, linear; flowers by threes in whorls." *Root* perennial, ſpindle-ſhaped. *Stem* herbacous, erect, ſmooth. *Leaves* an inch long, ſeſſile, acute, entire, reflexed at the edge, expanding, ſmooth. *Flowers* axillary, peduncled; peduncles capillary, ſeldom more than one flowered, three times the length of the leaves. 56. C. *tetraphylla*, Willd. 9. Mart. 64. Thunb. flor. jap. 87. "Leaves by fours, oblong, ſerrated." *Stem* two feet high, obſcurely angular, jointed, ſmooth, ſimple at bottom, panicled at top; branches four, oppoſite and alternate, wand-like, diffuſed, obſcurely quadrangular, ſmooth; the upper ones ſhorter, capillary. *Leaves* an inch or more long, the length of the internodes, ſeſſile, attenuated towards the baſe, acute, ſmooth, erect; green above, pale beneath, with a ſtrong midrib. *Flowers* on the branches numerous, drooping, on capillary peduncles; bractes briſtle-ſhaped, ſmooth; corolla whitiſh; anthers linear; ſtyle double the length of the corolla, ſtigma trifid.

† Leaves harſh to the touch.

57. C. *glauca*, Willd. 7. Mart. 65. Thunb. flor. jap. 88. "Leaves ſeſſile, egg ſhaped, ſerrated, glaucous beneath; ſtem angular, panicled; peduncles one-flowered." An under-ſhrub. *Stem* two feet high, erect, ſmooth; branches erect, zigzag, ſomewhat faſtigiate, angular, ſmooth. *Leaves* ſcattered, acute, a little reflexed at the edge, ſcabrous, netted; lower ones larger, expanding, upper gradually leſs, erect, about an inch long. *Flowers* axillary on the upper part of the branches; peduncles an inch long, erect; bractes one or two on a peduncle, alternate, lanceolate, reſembling the leaves; calyx ſomewhat angular, glaucous; ſegments lanceolate, reflexed; corolla large, blue. 58. C. *marginata*, Willd. 44. Mart. 66. Thun. jap. 89. "Leaves lanceolate, waved, ſerrated, bordered; branches weak; flowers terminal, ſolitary." *Stem* thick at the baſe, rather woody, decumbent; branches numerous, about ſeven inches long, capillary, rather erect, a little ſubdivided, ſtriated, ſmooth. *Leaves* on the lower part of the branches half an inch long, ſeſſile, alternate, white edged, hiſpid with white hairs. *Flowers* terminal, ſolitary. The laſt four were obſerved by Thunberg in Japan. 59. C. *paniculata*, Linn. jun. Supp. p. 139. Willd. 50. Mart. 59. Thunb. Prod. 39. "Leaves lanceolate, waved, hairy; ſtem angular, hiſpid; flowers in racemes." *Stem* herbaceous, panicled; branches divaricated. *Leaves* entire. A native of the Cape of Good Hope. 60. C. *latifolia*, Giant throat-wort, Linn. Sp. Pl. 11. Willd. 33. Mart. 22. Lam. Enc. 25. Ill. 2526. Eng. Bot. 302. "Leaves egg-lanceolate; ſtem quite ſimple, nearly round; flowers ſolitary, peduncled; calyxes ſmooth; fruit drooping." *Root* perennial, milky. *Stem* three or four feet high, erect, ſlightly angular, ſomewhat hiſpid, many-flowered. *Leaves* large, alternate, nearly ſeſſile, roughiſh, doubly ſerrated. *Flowers* large, blue, ſometimes white, axillary, almoſt always ſolitary, erect; calyx ſmooth, ſerrated. A native of Sweden, Switzerland, and other parts of Europe; common in Scotland and the north of England, rare in the ſouth. It is ſometimes cultivated in gardens. 61. C. *urticifolia*, Willd. 34. Schmidt. 173. "Stem angular, hiſpid; upper leaves egg-lanceolate, coarſely ſerrated: peduncles one-flowered, axillary, drooping; calyxes hiſpid." It differs from the preceding, chiefly in its hiſpid calyxes; but its ſtem is alſo more hiſpid, and has more prominent angles; its root and lower ſtem leaves are alſo heart-ſhaped, and in that reſpect approach more nearly to C. trachelium. A native of ſhady places in Germany and Bohemia. The urticifolia of Allioni (flor. pedem. n. 406.) taken up by Profeſſor Martyn n. 72., ſeems a different plant, which ought to be placed with a new ſpecific name in the preceding ſubdiviſion. It is thus characterized: "Stem roundiſh, ſimple, upper leaves ſeſſile; ſpike unilateral; peduncles one-flowered; calyxes ſmooth." Plant entirely ſmooth. *Stem* three feet high, ſtreaked. *Leaves* ſoft, egg-lanceolate, unequally and ſharply toothed. *Flowers* ſingle, axillary, on ſhort peduncles towards the top of the ſtem, with linear bractes; calyx five-cleft beyond the middle; ſegments narrow, not reflexed: corolla and calyx nearly equal. A native of Italy in woods. After all, the plants of Schmidt and Allioni are nearly allied to each other, and ſeem to differ chiefly in the comparative length of the calyx and corolla. Both of them may, perhaps, be not improperly conſidered as varieties of C. latifolia. Characters

drawn from the ſmoothneſs or roughneſs of the leaves, though they often afford a good and always an obvious diſtinction, and on that account make convenient ſubdiviſions in a large genus, are ſometimes fallacious, and can ſeldom be oppoſed to each other with rigid exactneſs. 62. C. *Trachelium*, nettle-leaved throat-wort, Linn. Sp. Pl. 16. Will. 41. Mart. 28. Lam. Enc. 26. Ill. 2527. Eng. Bot. 12. "Stem angular; leaves lanceolate-heart-ſhaped, acutely ſerrated; calyxes hiſpid; peduncles axillary, few-flowered." *Root* perennial. *Stem* two or three feet high, ſtiff, hiſpid. *Leaves* petioled, deeply and unequally ſerrated, harſhly rough, generally hiſpid with pungent briſtles. *Flowers* violet-coloured, rather leſs than thoſe of C. latifolia; ſometimes three, but more frequently only one on a peduncle; calyx hiſpid at the baſe and on the edge, but ſometimes ſmooth. A native of many parts of Europe; common in the ſouth, but rare in the north of England. 63. C. *rapunculoides*, Linn. Sp. Pl. 12. Willd. 36. Mart. 23. Lam. Enc. 27. Ill. 2528. Eng. Bot. 1369. "Leaves lanceolate-heart-ſhaped; ſtem branched; flowers ſcattered, unilateral, nodding; calyxes reflexed." *Root* perennial, creeping. *Stem* about a foot high, more or leſs branched, round, rough with deflexed hairs. *Leaves* ſcabrous; lower ones petioled, lower ones ſeſſile. *Flowers* blue, axillary. *Capſule* reſembling that of Rapunculus, but only half as large. *Segments of the calyx* linear, reflexed. *Openings* large at the very baſe of the capſule. *Seeds* elliptical, ſo much compreſſed as to be almoſt flat, plain on one ſide, marked with an elevated longitudinal line on the other, of a yellowiſh bay colour, ſcarcely ſhining. Gært. A native of Switzerland, France, and Auſtria; rare in great Britain, but, as appears from Buddle's herbarium, gathered among yew trees in ſome woods in Oxfordſhire, and found, apparently wild, by Dr. Skrimſhire at Blair in Scotland. 64. C. *bononienſis*, Linn. Sp. Pl. 13. Willd. 37. Mart. 24. Lam. Enc. 28. Ill. 2529. "Leaves egg-lanceolate, ſcabrous beneath, ſeſſile; ſtem panicled." *Root* perennial, large, woody. *Stem* with the habit of verbaſcum nigrum, three feet high or more, erect, rough. *Leaves* ſeſſile, almoſt heart-ſhaped, ſlightly toothed, covered with white hairs beneath. *Flowers* violet-colour, terminating the branches in a kind of ſpike, axillary; lower ones three together, on ſhort peduncles; upper ones ſingle, ſometimes two, ſeſſile. A native of Italy, Carniola, Switzerland; introduced into England in 1773 by John Earl of Bute. 65. C. *graminifolia*, Linn. Sp. 14. Willd. 40. Mart. 25. Lam. Enc. 29. Ill. 2530. "Leaves linear-awl ſhaped; head terminal." *Root* perennial, divided at the crown into ſeveral trunks, each producing a tuft of ſtraight, long, graſslike leaves, ciliated at their baſe. *Stems* ſimple, ſcarcely longer than the root-leaves. *Stem-leaves* alternate, rather embracing the ſtem. *Flowers* blue, five or ſeven together, in a head; bractes egg-ſhaped, acuminate; ſtigma twocleft. 66. C. *glomerata*, little Canterbury bells, Linn. Sp. Pl. 17. Willd. 42. Mart. 29. Lam. Enc. 30. Ill. 2531. Eng. Bot. 90. "Stem angular, ſimple; flowers ſeſſile; moſt of them collected into a head, a few ſolitary, and axillary within the upper leaves; leaves egg-ſhaped, ſcolloped." *Root* perennial, woody. *Stem* a foot high, erect, roundiſh, rather rough, ſeldom if ever branched, unleſs firſt eaten down by cattle. *Leaves* hairy, pale beneath; root-leaves a little heart-ſhaped, on long petioles; ſtem-leaves half embracing the ſtem. *Flowers* blue, purple, or white. A native of lime-ſtone and chalky ſoils in England, France, and other parts of Europe. 67. C. *petræa*, Linn. Sp. Pl. 20. Willd. 46. Mart. 32. Lam. Enc. 31. Ill. 2532. Bar. ic. 890. (Trachelium majus petræum; Pon. bald. 161.) "Stems ſimple, rough; leaves oblong-egg-ſhaped, hairy, ſeſſile; head terminal." Nearly allied to the preceding, but more hairy. *Stem* one or two feet high, erect, rough. *Leaves* all oblong, harſh, deep green above, whitiſh and cottony beneath; ſtem-leaves not half embracing the ſtem. Found firſt by Pona on mount Baldo: a native alſo of Piedmont, Sileſia, &c. 68. C. *Cervicaria*, Linn. Sp. Pl. 18. Willd. 43. Mart. 30, Lam. Enc. 32. Ill. 2533. "Hiſpid; flowers ſeſſile; head terminal; leaves lanceolate-linear, waved, ſcolloped." *Root* biennial, eſculent. *Stem* about a foot high, ſimple, or a little branched. *Leaves* ſtraight, almoſt linear, rough with hairs. *Flowers* blue or white, moſt of them in a head, a few axillary. A native of woods on the continent of Europe; introduced into England in 1783 by Dr. Pitcairn. 69. C. *thyrſoidea*, Linn. Sp. 19. Willd. 45. Mart. 31. Lam. Enc. 33. Ill. 2534. "Hiſpid; raceme oblong egg-ſhaped, terminal; ſtem quite ſimple; leaves lanceolate-linear." *Root* biennial, large, woody. *Stem* eight or ten inches high, erect, rough with white hairs. *Root leaves* tufted, rough, lanceolate-egg-ſhaped. *Stem-leaves* numerous, upright, ſcattered, hairy, a little harſh to the touch. *Flowers* yellowiſh white, very numerous, denſely diſpoſed in a kind of thyrſe; corolla hairy. A native of Auſtria, Switzerland, and the ſouth of France. 70. C. *lanuginoſa*, Lam. Enc. 34. Ill. 2535. (C. peregrina: Linn. Mant. Willd. 52?) "Hiſpid-lanuginous: leaves egg-ſhaped, wrinkled, ſcolloped, narrowing into a petiole: ſtem ſimple; flowers nearly ſeſſile, erect, open." *Stem* a foot high, erect, round, thickly covered with ſeparate white hairs. *Root-leaves* rough on both ſides, pale green above, whitiſh beneath, a little reſembling thoſe of the primroſe: *ſtem-leaves* ſmaller, alternate; the upper ones ſeſſile and rather acute. *Flowers* lateral and terminal, ſolitary, blue: calyx hiſpid, a little ſhorter than the corolla; ſegments lanceolate: corolla ſhort, very open: ſtyle not longer than the corolla: ſtigma three cleft. Cultivated for a long time in the royal garden at Paris, and ſuppoſed to be a native of Tartary. The peregrina of Linnæus ſprang up in ground ſown with ſeeds from the Cape of Good Hope, but it was probably mixed with them by accident. 71. C. *tomentoſa*, Lam. Enc. 35. Ill. 2536, (C. foliis profunde inciſis, tomentoſa tota & incana, Tourn. Cor. 3.) "Root-leaves long, ſpatula-ſhaped, ſcolloped; upper ones wedge-ſhaped; flowers peduncled, ſomewhat ſpiked; calyx downy." The whole plant covered with a fine white down. *Stem* round. *Flowers* oblong, in a looſe, ſometimes unilateral ſpike, on ſhort peduncles: calyx half the length of the corolla. Deſcribed by La Marck from a dried ſpecimen in the herbarium of Juſſieu. Native country unknown. 72. C. *argentea*. Lam. Enc. 36. Ill. 2537. (C. leucoii folio: Tourn. Cor. 3.) "Leaves oblong, narrow, ſilvery-white with down; ſtem panicled: branches one-flowered." *Stem* three or four inches high. *Root-leaves* numerous, a little enlarged towards their ſummit, ſcarcely an inch long, entire. *Stem-leaves* almoſt linear. *Flowers* terminal. A native of Armenia, preſerved in the herbarium of Juſſieu. 73. C. *calaminthifolia*, Lam. Enc. 37. Ill. 2538. (C. ſaxatilis, foliis crenatis & veluti rugoſis: Tourn. Cor. 3.) "Pubeſcent: ſtem branched, decumbent: ſtem-leaves roundiſh egg-ſhaped, ſcolloped, nearly ſeſſile; thoſe on the branches ſmall, acute: corolla pubeſcent on the outſide." *Stem* ſcarcely a foot long. *Stem leaves* ſpatula-ſhaped, like thoſe of the daiſy. *Flowers* terminating and axillary: corolla a little tubular. Found by Tournefort in the iſland of Naxos; deſcribed from a dried ſpecimen in the herbarium of Juſſieu, and an original drawing by Aubriet. 74. C. *hiſpidula*, Linn. jun. Supp. p. 142. Willd. 49. Mart. 27. Lam. Enc. 40. Ill. 2542. "Hiſpid: flowers erect; calyx the length of the corolla." *Root* annual. *Stem* about four inches high, branched, eſpecially near the top. *Leaves* alternate, linear, acuminate, ciliated, eſpecially the midrib. *Flowers* nearly ſeſſile, terminal: ſegments of the calyx linear, ciliated: corolla funnel-ſhaped: ſtigma three-cleft. A native of the Cape of Good Hope. 75. C. *capenſis*, Linn. Sp. Pl. 36. Willd. 77. Mart. 51. Lam. Ill. 2543. Bot. Mag. 782. "Leaves lanceolate, toothed, hiſpid: peduncles very long: capſules beſet with ſtiff hairs." *Root* annual. *Stem* round, hairy, branched. *Leaves* waved, oppoſite below, ſcattered near the top. *Flowers* blue, nodding: ſegments of the calyx linear-lanceolate, entire, ſpreading: corolla funnel-ſhaped; tube ſhort, hairy within; ſegments of the border egg-ſhaped, acute: ſtigma five-cleft; ſegments petal-like, egg-ſhaped, ſpreading, deep blue, hiſpid underneath. *Capſule* five-celled, erect, obſoletely ten-angled, opening with five lanceolate valves. *Seeds* flat, ſhining, numerous. A native of the Cape of Good Hope. 76. C. *cernua*, Willd. 53. Thunb. Prod. 39. "Leaves oblong, waved, hairy: flowers terminal, drooping: calyx ſmooth." A native of the Cape of Good Hope. 77. C. *Erinus*, Linn. Sp. Pl. 40. Willd. 85. Mart. 56. Lam. Enc. 38. Ill. 2544. Læf. it. 127. (Rapunculus minor, foliis inciſis Bauh. pin.) "Stem dichotomous: leaves ſeſſile; upper ones oppoſite, three toothed." *Root* annual. *Stem* about ſix inches high. *Root-leaves* oblong; *Stem-leaves* oblong, a little ſpatula-ſhaped. *Flowers* pale blue, ſmall. A native of barren places in Italy, Spain, and the South of France. 78. C. *erinoides*. Linn. Mant. p. 44. Willd. 83. Mart. 54. Lam. Enc. 39. Ill. 2545. "Stems diffuſe; leaves lanceolate, ſlightly ſerrated, decurrent with a ſcabrous edge: flowers peduncled, ſolitary." *Stems* much branched. *Leaves* alternate. *Flowers* terminal, erect; germ not angular: ſtyle three-cleft. According to Linnæus it reſembles lobelia erinoides, and La Marck obſerves that his only ſynonym is Herm. Lugd. 100. tab. 11.; with a mark of doubt, the ſame which he has quoted under Lobelia erinus without ſuch mark, and which is alſo the only one under that ſpecies. Profeſſor Martyn conſiders them as one and the ſame plant, and has accordingly referred C. erinoides to Lobelia erinus; but La Marck, notwithſtanding his remark in the Encyclopedie Methodique, has continued C. erinoides in his Illuſtrations. Said to be a native of Africa. 79. C. *repens*. Mart. 78. Loureiro Cochin. 139. "Stem ſubdivided, creeping: leaves oblong, fleſhy: flowers ſolitary." *Stem* herbaceous, much branched. *Leaves* entire, ſmall, hairy, oppoſite. *Flowers* ſmall, white, ſeſſile, axillary: ſegments of the calyx acute, upright: ſegments of the corolla rounded, acuminate: ſtigma three-cleft. *Capſules* roundiſh triangular, hairy, three-celled, one-ſeeded. A native of Cochinchina.

* * Calyx five-cleft: capſules elongated, priſm-ſhaped.
(Priſmatocarpus: l'Herit. legouiſia: Durande.)

80. C. *fruticoſa*, Linn. Sp. 30. Willd. 69. Mart. 45. Lam. Enc. 60. Ill. 2569. C. africana, ericæ folio Herm. afr. 5. "Capſules five-celled, ſtem ſhrubby; leaves linear-awl-ſhaped: peduncles very long." *Root* perennial. *Flowers* blue, expanded. A native of the Cape of Good Hope. 81. C. *Speculum*, Venus's looking-glaſs. Linn. Sp. Pl. 31. Willd. 70. Mart. 46. Lam. Enc. 61. Ill. 2570. Bot. Mag. 102. "Stem much branched, diffuſe: leaves oblong, ſlightly ſcolloped: flowers ſolitary." *Root* annual. *Stems* from ſix to ten inches high. *Leaves* ſmall, ſeſſile. *Flowers* purple, inclining to violet, peduncled, terminal, folding up in the evening into a pentagon figure: ſegments of the calyx linear-lanceolate, acute, the length of the corolla: corolla flat, wheel-ſhaped, deeply divided; ſegments egg-ſhaped: valves of the nectary ſcarcely diſcernible. A native of corn-fields in the South of Europe; and a common annual in Engliſh gardens, where, when once introduced, it generally ſows itſelf without farther trouble. 82. C. *hybrida*. Linn. Sp. Pl. 32. Willd. 71. Mart. 47. Lam. Enc. 62. Ill. 2571. Eng. Bot. 375. "Stem often branched at the baſe, ſtiff, leaves oblong, ſcolloped, waved; corolla ſhorter than the calyx." *Root* annual, ſmall, fibrous. *Stem* nearly erect, a little zigzag, angular. *Leaves* alternate, remote, ſeſſile, rough at the edge. *Flowers* ſmall, terminal, ſolitary, ſeſſile, pale purple: ſtyle and ſtigma club-ſhaped, hairy. From a compariſon of many wild and cultivated ſpecimens of C. ſpeculum and hybrida, Dr. Smith is perſuaded that they are varieties of each other, and that the ſegments of the calyx in both are very variable in length and breadth, as is alſo the corolla in ſize. Linnæus ſuppoſed it a mule produced from C. ſpeculum, impregnated by ſome other plant. A native of corn fields on a chalky ſoil in Cambridgeſhire, Norfolk, and Suffolk, and in ſeveral parts of the Continent of Europe. 83. C. *Pentagonia*. Linn. Sp. Pl. 34. Willd. 75. Mart. 49. Lam. Enc. 64. Ill. 2572. (C. thracica. Tourn. Inſt. p. 112. Rai Hiſt. p. 742. n. 2.) "Stem ſubdivided, much branched: leaves linear acuminate." *Root* annual, ſimple, white. *Stem* ſlender, weak. *Leaves* ſeſſile; lower ones broader. *Flowers* terminal, of a paler blue, twice as large, more concave, and more bell-ſhaped than thoſe of C. ſpeculum, with a corolla leſs deeply divided. Cultivated by Mr. Ray before 1686, from ſeed collected in Thrace, by Mr. Covill of Cambridge. La Marck from the inſpection of ſpecimens preſerved in the herbarium of Juſſieu, judges it to be only a variety of C. hybrida. 84. C. *perfoliata*. Linn. Sp. Pl. 35. Willd. 76. Mart. 50. Lam. Enc. 65. Ill. 2573. Moriſ. hiſt. 2. tab. 2. fig. 3. Barr. rar. 83. tab. 33. Tourn. 112. Rai. hiſ. 743. 3. "Stem ſimple: leaves heart-ſhaped, toothed, embracing the ſtem: flowers ſeſſile, aggregate." *Root* annual. *Stem* from ſix inches to a foot and half high, ſometimes with one or two branches near the bottom, upright, angular, ſlightly woolly. *Flowers* blue, ſmall, axillary, three or four together. A native of Virginia. 85. C. *ericoides*. Lam. Ill. 2574. (C. ſubulata, Thun. Prod. 38? Polemonium roelloides, Linn. jun. Supp. 139?) "Stem erect, ſlender, leaves awl-ſhaped, tooth-ciliated: panicle naked, few-flowered. 86. C. *Priſmatocarpus*. Willd. 72. Mart. 75. Hort. Kew. i. p. 224. (C. nitida: Lam. Ill. 275. Priſmatocarpus nitidus: l'Herit. Sert. 2. tab. 3.) "Stems ſhrubby at the baſe: leaves egg-lanceolate, toothed, very ſmooth: flowers terminal; corolla twice the length of the calyx." *Root* annual. *Stem* decumbent. *Flowers* ſeſſile. *Capſule* linear. A native of the Cape of Good Hope; introduced at Kew in 1787. Willdenow intimates a doubt whether it may not be the ſame as C. cernua, n. 76.

* * * Calyx ten-cleft; five alternate ſegments reflexed, covering the capſule.

87. C. *nana*, Lam. Enc. 41. Ill. 2546. "Stem one-flowered: root-leaves inverſely egg-ſhaped, ciliated, rugged: ſtem-leaves lanceolate, a little toothed: calyx hiſpid." Stem two or three inches high. *Stem-leaves* two, alternate, ſlightly hairy. *Flower* large, terminal, upright: border ſometimes a little bearded: ſegments of the calyx lanceolate, ſtraight, expanding. Cultivated in the royal garden at Paris, and ſuppoſed to be a native of the Alps. It differs from C. ceniſia chiefly in its calyx. 88. C. *ligularis*, Lam. Enc. 42. Ill. 2547. "Stem one-flowered: root-leaves ſpatula-ſhaped: ſtem-leaves ſtrap-ſhaped, entire: flower erect." *Stem* three inches high, upright, ſlender, nearly ſmooth. *Stem-leaves* numerous, alternate, ſlightly ciliated. *Flower* terminal, upright, tubular, bell-ſhaped, a little bearded: calyx hiſpid; ſegments almoſt linear. Cultivated in the royal garden at Paris, and ſuppoſed to be a native of the

Alps. 89. C. *barbata*, Linn. Sp. Pl. 22. Willd. 57. Mart. 35. Lam. Enc. 48. Ill. 2548. "Capſules five-celled: ſtem generally few-flowered: leaves lanceolate: corolla bearded." *Root* ſaid by ſome authors to be perennial, by others biennial. *Stem* ſimple, from ſix to eighteen inches high, hairy. *Root leaves* from five to ten, bluntiſh, obſcurely ſcolloped, rather rugged, narrowing into flat petioles. *Stem-leaves* few, ſeſſile. *Flowers* blue or white, peduncled, commonly drooping, few, unilateral: calyx hiſpid: ſmoothiſh on the outſide, bearded within with long white hairs. According to Scopoli, it varies with one, two, three, or four, and ſometimes with a greater number of flowers. According to Haller the capſule is five-angled, but only three-celled. A native of the Alps and other mountains in Europe. 90. C. *alpeſtris*, Mart. 73. Allion. Ped. 2. 418. tab. 6. fig. 3. (C. Allionii, Willd. 54. Vill. delph. 2. tab. 10. C. trilocularis, Turr. fl. ital. Prod. p. 64. n. 10.) "Stem ſimple, generally one flowered, hiſpid: leaves linear-lanceolate, waved, hiſpid." *Root* perennial, creeping. *Stems* numerous, two or three inches high. *Root-leaves* of the firſt year ſmall, blunt, almoſt round; ſucceeding ones longer: bottom ſtem leaves ſtill longer, acute, all roughiſh and ciliated. Haller conſiders it as a variety of the preceding; but Allioni and Villars pronounce it to be diſtinct. A native of the Alps. 91. C. *dichotoma*, Linn. Sp. Pl. 24. Mart. 33. Lam. Enc. 43. Ill. 2549. (C. mollis, β. Willd.) "Capſules five-celled: ſtem forked: flowers drooping." *Root* annual. *Stem* near a foot high, rather ſlender, ſlightly hiſpid; branches ſpreading. *Leaves* ſeſſile, lanceolate-egg-ſhaped, ſcabrous, diſtant, alternate, often oppoſite under the forks of the ſtem. *Flowers* bluiſh, ſolitary, terminal, and in the forks of the branches, on ſhort peduncles: calyx hiſpid; ſegments egg-ſhaped-acuminate. Lam. A native of Sicily and the Levant. 92. C. *mollis*. Linn. Sp. Pl. 25. Willd. 61. Mart. 38. Lam. Ill. 2550. Bot. Mag. 404. (dichotoma β. Enc.) "Capſules five-celled, peduncled: ſtem proſtrate: leaves nearly round." *Stems* decumbent, a little branched, rather ſtiff, hairy. *Leaves* ſmall, ſeſſile, nearly entire, cottony. *Flowers* axillary, ſolitary, on long petioles, ſix times larger than the leaves: calyx large, naked, Linn. A native of Spain and the Levant. 93. C. *Medium*, Linn. Sp. Pl. 21. Willd. 56. Mart. 34. Lam. Enc. 44. Ill. 2551. Coventry or Canterbury bells. "Capſules five-celled; ſtem upright; flowers upright." *Root* biennial. *Stem* two feet high, round, furrowed, hairy, rugged a little branched. *Root-leaves* narrowed at the baſe, into long petioles ſlightly ſcolloped, hairy, harſh to the touch. *Stem-leaves* oblong, ſeſſile, ſcolloped. *Flowers* blue, purple or white, large: ſegments of the corolla ſhallow, reflexed: ſtigma five-cleft. *Capſule* entirely covered by the reflexed ſegments of the calyx. A native of woods on the Continent of Europe; common in Engliſh gardens, where it was cultivated in 1597. 94. C. *punctata*. Willd. 55. Lam. Enc. 45. Ill. 2552. Gmel. Sib. 3. p. 155. tab. 30. "Capſules three-celled; ſtem ſimple, upright: flower nodding." *Stem* about a foot high. *Root-leaves* petioled, egg-ſhaped, acuminate, ſerrated, hairy on both ſides, whitiſh beneath. *Stem-leaves* alternate, lanceolate, attenuated at the baſe into ſhort petioles. *Flowers* at the top of the ſtem, on ſhort peduncles; corolla whitiſh without, hairy within, and marked with purple ſpots. A native of Siberia. 95. C. *pelviformis*, Lam. Enc. 46. Illuſt. 2553. Tourn. Cor. 3. "Capſules five-celled, root-leaves egg-ſhaped, ſerrated, petioled; ſtem-leaves nearly ſeſſile; flower large, baſon-ſhaped." *Root* large, about a foot long, fibrous, whitiſh. *Stems* numerous, ſix or ſeven inches long, generally ſimple, hairy, decumbent. *Leaves* hairy. *Flower* ſolitary, terminal, pale blue; corolla ſhort, a little ſwelling, ſlightly hiſpid at its angles and edges. Found by Tournefort in the iſland of Candia; deſcribed by La Marck, from a dried ſpecimen in the herbarium of Juſſieu, an original drawing by Aubriet and the MSS. of Tournefort. 96. C. *tubuloſa*, Lam. Enc. 47. Ill. 2554. (C. cretica caulibus ſupinis, flore oblongo, Tourn. Cor. 3.) "Root-leaves petioled, egg-ſhaped, unequally toothed, gaſhed at the baſe; ſtem-leaves oblong, ſerrated, ſeſſile; flower oblong." Allied to C. dichotoma. *Stems* numerous, ſlender, procumbent, ſcarcely a foot long, hairy, reddiſh, branched. *Flowers* blue, ſolitary, terminal, upright; calyx half the length of the corolla; corolla tubular. Lam. Found by Tournefort in the iſle of Candia. 97. C. *ſpicata*, Linn. Sp. Pl. 15. Willd. 58. Mart. 36. Lam. Enc. 49. Ill. 2555. "Hiſpid; ſpike looſe, flowers alternate; leaves linear, entire." The whole plant hairy in all its parts. *Root* biennial. *Stem* ſimple, four or five feet high. *Stem-leaves* half embracing the ſtem. *Flowers* blue, ſeſſile, axillary, from one to three in each axil, forming a long ſpike, reſembling that of Viper's bugloſs. A native of the Vallais, Dauphiné, and Alſace. 98. C. *ſpecioſa*, Lam. Ill. 2556. Pourret. chlor. nar. 15. "Hiſpid; leaves linear, tooth-ſcolloped; root-leaves very long; flowers ſomewhat panicled, nodding." A native of the South of France. 99. C. *alpina*, Linn. Sp. Pl. 1659. Willd. 60. Mart. 37. Lam. Enc. 50. Ill. 2557. Jacq. vin. 210. Auſt. 2. tab. 118. Hall. helv. 695. "Stem ſimple; peduncles one-flowered, axillary, with two bractes." *Root* perennial. *Stem* about ſeven inches high, ſmooth. *Root-leaves* linear-oblong, growing wider towards the top, blunt, entire, hairy. *Stem-leaves* ſtrap-ſhaped, ſmaller, ſeſſile. *Flowers* blue, upright; ſtigma trifid. *Capſule* roundiſh, three-celled. *Seeds* browniſh, with a membranous edge. A native of the Alps, and of mountains in Auſtria and Sileſia. 100. C. *ſaxatilis*, Linn. Sp. Pl. 26. Willd. 62. Mart. 39. Lam. Enc. 51. Ill. 2558. (C. cretica ſaxatilis, bellidis fol. Tourn. Inſt. p. 111. Barr. rar. 79. tab. 813. Bocc. muſ. 2. tab. 64.) "Capſules five-keeled; flowers alternate, nodding; leaves inverſely egg-ſhaped, ſcolloped. *Stems* from four inches to a foot high. *Root-leaves* ſpatula-ſhaped, two inches long, ſmooth, rather fleſhy, ſlightly toothed. *Flowers* blue, hairy within. *Capſules* hemiſpherical, five-celled. A native of the iſle of Candia. 101. C. *alliariæfolio*, Willd. 63. (C. orientalis Alliariæfol. Tourn. Cor. 3.) "Root-leaves kidney ſhaped, doubly toothed: ſtem-leaves egg-ſhaped, toothed, ſeſſile." *Root-leaves* large, rather rough, on long petioles; ſtem-leaves ſmall; flowers nodding. A native of the Levant. 102. C. *ſibirica*, Willd. 64. Mart. 40. Lam. Enc. 52. Ill. 2559. Gmel. Sib. 3. tab. 29. Jacq. Auſt. tab. 200. Bot. Mag. 659. "Capſules three-celled; ſtem panicled." *Root* biennial. *Stem* a foot high, upright, angular, ſlightly hiſpid, divided only at the top into a looſe panicle. *Leaves* oblong, almoſt linear, half embracing the ſtem, rough and commonly waved at their edges. *Flowers* ſmall, oblong; capſules hiſpid; peduncles often three-flowered. A native of Siberia, Auſtria, and Piedmont; introduced by Dr. W. Pitcairn in 1783. 103. C. *violæfolia*, Lam. Enc. 53. Ill. 2560. "Capſules covered; root-leaves heart-ſhaped, ſcolloped, petioled; flowers large, peduncled; calyx hiſpid." *Root* ſmall, fibrous. *Stem* three or four inches high. *Root-leaves* a little hairy beneath, and on their petioles, reſembling thoſe of Viola canina. *Stem-leaves* alternate, oblong-oval, toothed on ſhort petioles. *Flowers* two or three; corolla a little bearded: ſegments ſhallow; calyx-ſegments lanceolate. Introduced into the royal garden at Paris in 1765, and ſuppoſed to be a native of Siberia. Lam. in his Illuſtrations expreſſes a doubt, whether it may not be C. carpatica of Jacq. hort. 1. tab. 57. quoted as a ſynonym to our carpatica, n. 33. We have not Jacquin's work at hand, but this plant cannot be the carpatica of the Engliſh gardens figured in the Botanical Magazine, which has a five-cleft calyx, with the ſegments a little reflexed, but not alternate ones, covering the calyx as in all the ſpecies of this diviſion; whereas La Marck deſcribes the calyx of his violæfolia to be, à cinq decoupures lanceolées, et *à ſinus reflechies*, the expreſſion by which he uniformly denotes what we call the five alternate reflexed ſegments. Has he been led into an error by the ambiguous phraſe *calyce reflexo* in the definition of the younger Linnæus? If ſo, the preſent ſpecies muſt be expunged. He appears to have formed his deſcription only from a dried ſpecimen in the herbarium of Juſſieu. 104. C. *heterophylla*, Linn. Sp. Pl. 39. Willd. 84. Mart. 55. Lam. Enc. 54. Ill. 2561. (C. ſaxatilis, foliis inferioribus Bellidis, cæteris Nummulariæ, Tourn. Cor. 3. It. 1. tab. 243.) "Leaves inverſely egg-ſhaped, ſmooth, entire; ſtems ſpreading." *Root* perennial, white, ſweet and full of milk. *Stem* ſlender, feeble, generally ſimple. *Root-leaves* ſpatula-ſhaped, narrowed into petioles, dark green, ſhining. *Stem-leaves* numerous, ſmall, roundiſh, acute, fleſhy, bright green, on ſhort petioles, entire. *Flowers* clear blue, ſmall, axillary and terminal, on ſhort peduncles. A native of the Levant. 105. C. *tridentata*, Linn. Mant. p. 44. Willd. 65. Mart. 41. Lam. Enc. 55. Ill. 2562. Schreb. dec. 3. tab. 2. (C. orientalis pumila; Tourn. Cor. 3.) "Capſule five-celled; ſtem one-flowered; root-leaves three-toothed." *Stem* twice as long as the root-leaves. *Root-leaves* like thoſe of Statice reticulata, lanceolate, wedge-ſhaped, often with three teeth near the ſummit; ſtem-leaves linear. *Flower* large, upright, ſolitary. A native of the Levant. 106. C. *parvifolia*, Lam. Enc. 56. Ill. 2564. (C. orientalis, foliis inciſis, Tourn. Cor. 4.) "Stem branched near the top; root-leaves inverſely egg-ſhaped, ſcolloped, on long petioles. *Stem-leaves* lanceolate-egg-ſhaped, attenuated and gaſhed at the baſe; flowers panicled." *Stem* about a foot high, round, ſlightly pubeſcent. *Flowers* ſmall, numerous, in terminal panicles. A native of the Levant. 107. C. *lyrata*, Lam. Enc. 57. Ill. 2564. (C. foliis profundè [illegible]; fructu duro, Tourn. Cor. 3.) "Hiſpid; root-leaves lyre-ſhaped, on long petioles; terminal lobe heart-ſhaped, ſcolloped; flowers lateral and terminal, nearly ſeſſile." *Stem-leaves* ſeſſile, egg-ſhaped, narrowed at both extremities, gaſhed, toothed. *Flowers* upright. A native of the Levant, confounded by Linnæus with the following. 108. C. *laciniata*, Linn. Sp. 27. Willd. 66. Mart. 42. Lam. Enc. 58. Ill. 2565. (C. græca ſaxatilis, Jacobææ folio. Tourn. Cor. 3. It. 1. p. 99. tab. 99.) The ſynonyms of Linnæus in Species Plantarum taken from C. Bauhin, Moriſon, and Rauwolf, belong to Michauxia campanuloides.) "Capſules peduncled; leaves ſerrated; root-leaves lyre-ſhaped; ſtem-leaves lanceolate." Whole plant ſmooth. *Stem* a foot high, branched. *Flowers* large, terminal and axillary, very open; ſtigma five cleft. A native of Greece. 109. C. *capitata*, Bot. Mag. 811. "Leaves oblong, obtuſe, hiſpid, embracing the ſtem; flowers terminal, cluſtered." Whole plant hiſpid. *Root* biennial. Raiſed by J. Swainſton eſq. at Twickenham, from ſeeds brought from Greece by the late Profeſſor Sibthorp. 110. C. *ſtricta*, Linn. Sp. Pl. 28. Willd. 67. Mart. 43. Lam. Enc. 59. Ill. 2566. (C. orientalis folio longo; Tourn. Cor. 3.) "Leaves hairy; ſtem-leaves lanceolate, ſerrated; ſtem ſimple, flowers ſeſſile." *Stem* a foot and a half high, ſimple, hairy. *Root-leaves* heart or egg-ſhaped, rather oblong, ſerrated, hairy on both ſides, petioled. *Stem-leaves* alternate, remote, ſeſſile, obtuſe, narrowed at the baſe. *Flowers* axillary, ſolitary, upright; calyx hairy. Linn. A native of Syria and Paleſtine. 111. C. *edulis*, Lam. Enc. p. 590. Ill. 2567. Forſk. Ægyp. p. 44. n. 46. "Stem hiſpid, branched; leaves egg-ſhaped, acute, ſerrated, ſeſſile." *Root* thick, eſculent, of an agreeable taſte. *Flowers* pale blue, with violet veins, ſometimes white; ſegments of the calyx ciliated. A native of Arabia. 112. C. *ſtrigoſa*, Willd. 59. Lam. Ill. 2568. Vahl. Symb. 3. p. 34. "Leaves lanceolate, entire; peduncles axillary, one flowered; ſtem beſet with ſtiff briſtles." *Root* annual. *Flowers* nodding; corolla hairy on the outſide. A native of the Levant.

*Propagation and Culture.* Such of the ſpecies as come from the Cape muſt be kept in the dry ſtove, and treated like the other plants of the ſame climate; they may generally be increaſed from cuttings. Moſt of the others are hardy plants, which bear the open air, and will thrive in almoſt any ſituation. Thoſe that are annual are uſually ſown in the ſpring, in the borders of the flower garden; but, if ſown in the preceding autumn, they will be ſtronger and flower a month earlier. The perennial ones are eaſily propagated by parting the roots in autumn, but where this practice is long continued, the plants are apt to degenerate, and at length ſeldom produce ſeeds. It is deſirable, therefore, to raiſe a ſucceſſion from ſeeds, which will produce plants that are more vigorous, and bear a greater profuſion of flowers. The pyramidalis, in particular, is ſeldom fit to adorn halls and chimneys for two ſucceſſive ſeaſons. In order to procure good ſeeds, ſtrong plants ſhould be ſelected which grow in a warm ſituation, and which have been ſcreened from great rains at the time when their flowers were fully open. The ſeeds ſhould be ſown in autumn in pots and boxes filled with light undunged earth; and in the winter ſhould be ſheltered from ſevere froſts under a hotbed frame. In ſummer, they muſt be kept clear from weeds, and moderately watered in very dry ſeaſons. In September, when the leaves of the plants begin to decay, they ſhould be tranſplanted into beds of light ſandy earth without any mixture of dung, and care ſhould be taken not to break or bruiſe the roots. They ſhould be ſet about four inches from each other, and in two years will be ſtrong enough to flower. The Rampion, when it is cultivated for the table, ſhould be ſown in a ſhady border about the latter end of May; and in the courſe of the ſummer ſhould undergo three hoeings to cut up the weeds, and thin the plants to the diſtance of three or four inches. The roots are fit for uſe in the winter, and will continue good till April. If the ſeeds are ſown too early, the plants are apt to flower the ſame ſeaſon, by which the roots are always ſpoiled. See Martyn's Miller.

CAMPANULA *canarienſis*, (Linn. Sp. Pl. 29.) See CANARINA *Campanula*.

CAMPANULA *africana fruteſcens*, (Comm. hort. 2. p. 77. tab. 30.) See ROELLA *ciliata*.

CAMPANULA *capitis bonæ ſpei foliis articulatis*, (Pet. muſ. 21. fig. 157.) See ROELLA *reticulata*.

CAMPANULA *ſphærocephalus*, (Pluk. alm. 77. tab. 152. fig. 6.) See PHYTEUMA *comoſa*.

CAMPANULA *lutea linifolia*, (Lob. ic. 414.) See LINUM *campanulatum*.

CAMPANULA *minor fruteſcens*, (Brown. Jam. 166. tab. 14. fig. 1.) See HAMELIA *chryſantha*.

CAMPANULA *arboreſcens*, (Brown. Jam. 166.) See HAMELIA *grandiflora*.

CAMPANULA *ſerpillifolia*, (C. and J. Bauh. Scheuch. Tourn. Moriſ. Ray.) See LINNÆA.

CAMPANULA, in *Zoology*, a ſpecies of MEDUSA, found in the Greenland ſeas, and deſcribed by O. Fabricius. The diſk is gibbous; border wide, and ciliated; beneath a hairy croſs.

This kind preys on the marine oniſci, crabs, and other ſmall creatures, and is chiefly obſerved in autumn. Its body is of a conic-orbicular form, with the fringe, and hairy croſs of a yellow colour, and ſometimes white; beneath hollow and ſnowy white.

CAMPANULACEÆ, in *Botany*, the fourth order of the ninth claſs of Juſſieu's natural orders, ſo called from their affinity to the genus Campanula. Juſſieu gives them the following character. *Calyx* ſuperior, ſometimes but rarely half inferior; border divided. *Corolla* inſerted on the upper part of the calyx, moſt frequently regular, generally ſhrivelling; border divided. *Stamens* inſerted under the corolla, as many as its ſegments, and generally alternating with them, moſt commonly five; anthers either diſtinct or united. *Germ* glandular above; ſtyle one; ſtigma either ſimple, or divided. *Capſule* moſt commonly five-celled, but in ſome caſes two, five or ſix-celled, often many-ſeeded, and generally opening at its ſides. *Seeds* fixed to the interior angle of the cells. *Stems* generally herbaceous, but ſometimes ſhrubby; milky. *Leaves* moſt frequently alternate. *Flowers* diſtinct, or in a few inſtances aggregate, and encloſed in a common calyx. Juſſieu includes in it, Ceratoſtema, Forgeſia, Mindium, Canarina, Campanula, Trachelium, Roella, Geſneria, Cyphia, Scævola, Phyteuma, Lobelia, and Jaſione. According to Ventenat, its genera are Michauxia, Canarina, Campanula, Trachelium, Roella, Phyteuma, Scævola, Goodenia, Lobelia and Jaſione. His Michauxia is the Mindium of Juſſieu.

CAMPBELL, Archibald, in *Biography*, the deſcendant of an ancient and noble family in Scotland, was born in the year 1598; and having been educated in the profeſſion of the proteſtant religion, according to the ſtricteſt rules of the church of Scotland, as it was ſettled immediately after the reformation, he zealouſly ſupported that church, and the conſtitution of his country, according to the ideas which he had formed of its legal eſtabliſhment. In the earlier period of his life, he avowed his attachment to the king, and was diſtinguiſhed by marks of royal favour. At the commencement, and during the progreſs of the rebellion, he ſeems to have maintained his loyalty; and after the eſtabliſhment of the commonwealth his country was the laſt that ſubmitted, and even then, his ſon did not ſubmit. At length, Argyle himſelf, who had been created marquis in 1641, was induced, by the preſſing circumſtances of the times, and the authoritative interference of general Monk, to yield to the ruling powers. After the reſtoration, he was tried for his compliance, under a charge of treaſon, and ſentenced by the parliament of Scotland to be beheaded. During his trial, he behaved with great firmneſs and dignity: and on the ſcaffold manifeſted the intrepidity of a hero, or rather, as the writer of his life ſays, the conſtancy of a Chriſtian, aſſerting the uprightneſs of his conduct, and the ſincerity of his affection both to king Charles I. and king Charles II. As to his character, Mr. Hume (Hiſt. vol. vi. p. 272.) repreſents him as a man equally ſupple and inflexible, cautious and determined, and entirely qualified to make a figure during a factious and turbulent period. Biog. Brit.

Campbell, Archibald, earl of Argyle, ſon to the former, was educated under his father's eye, in the true principles of loyalty and of the Chriſtian religion, and diſtinguiſhed himſelf, in an eminent degree, by his perſonal character and ſteady attachment to the royal family. When Charles II. was invited home to receive the crown of the kingdom in 1650, he was conſtituted colonel of his majeſty's foot-guards by the Scots parliament, which then aſſerted a kind of ſovereign authority; but he declined accepting the office, till he obtained a commiſſion from the king; to whoſe favour he was recommended by his fidelity and valour in his ſervice, as well as by his affectionate and reſpectful attention to his perſon. After his majeſty's defeat at Worceſter, he adhered inflexibly to the royal cauſe, nor did he deſert it, when the king's affairs were become deſperate, and his own were reduced to a ſimilar condition. After having capitulated in 1655, to the victorious forces of the Engliſh, in conſequence of orders from general Middleton, ſanctioned by the king's authority, he determined to live peaceably, though he would never acknowledge either Oliver's or Richard's government; and of courſe he was obnoxious to perſons in power, and impriſoned by them. After the king's reſtoration, his enemies, jealous of the favour and influence which he was likely to acquire, combined in their attempts to deſtroy him; and they prevailed with the Scots parliament to impriſon him, and to commence a proceſs againſt him for the crime, ſtiled in their laws, leaſing-making, or creating diſſenſion between the king and his ſubjects, by giving the former falſe informations. They proceeded ſo far as to condemn him to loſe his head, and to forfeit his whole eſtate; but the king interpoſed to prevent the final execution of their purpoſes. At length, his friends came into power, and he was releaſed from a long and ſevere impriſonment. He was alſo ſoon after reſtored to his grandfather's title and eſtate, and part of his father's was ordered to be ſold for the payment of his debts. In the ſubſequent part of this reign, he behaved towards his ſovereign with reſpect and affection; and in his oppoſition to thoſe meaſures of the court which he could not approve, he manifeſted a mild and peaceable diſpoſition. When his majeſty thought fit to ſend his brother, the duke of York, into Scotland, in 1681, a parliament was convened, which, among other laws that were propoſed and enacted, paſſed an act for eſtabliſhing a teſt, obliging all who poſſeſſed offices, civil, military, or eccleſiaſtical, to take an oath not to attempt any change in the conſtitution of church or ſtate. This oath contained ſeveral clauſes, aſſerting the king's ſupremacy, renouncing the covenant, and ſanctioning paſſive obedience, introduced by the courtiers, to which the country party added another clauſe, of adhering to the proteſtant religion. The courtiers, however, propoſed, that all princes of the blood ſhould be exempted from the obligation of taking this oath. Argyle zealouſly oppoſed this exception, intimating, that the ſole danger to be dreaded, with regard to the proteſtant religion, muſt proceed from the perverſion of the royal family. His conduct, on this occaſion, excited the indignation of the duke, and expoſed him to its fatal conſequences.

When the earl of Argyle took this teſt, which he was obliged to do as a privy counſellor, he did it with an explanation which he ſubmitted to the approbation of his royal highneſs, and the whole privy-council. The explanation was allowed, and the earl took his ſeat at the board. However, to his great ſurpriſe, he was a few days after committed to priſon, and proſecuted for high treaſon, leaſing-making, and perjury. Three out of five judges found him guilty of the two firſt charges, and a jury of 15 noblemen gave verdict againſt him. The king's leave was obtained for pronouncing ſentence againſt him, but he ordered the execution of it to be delayed. The earl, having little reaſon to expect either juſtice or mercy from his enemies, contrived to make his eſcape from priſon, and arrived ſafely in London, where the place of his concealment was known at court, though the king would not ſuffer him to be arreſted. In the mean while, the privy-council of Scotland publicly proclaimed his ſentence at the croſs, and cauſed his coat of arms to be reverſed and torn. As ſoon as a convenient opportunity occurred, the earl went over to Holland, and continued there during the remaining part of that reign. Conceiving, probably, that his attainder had entirely diſſolved the obligations by which he was bound as a Britiſh ſubject, and conſidering the government in Scotland as unſettled, before king James II. had taken the coronation oath, he concerted meaſures with the duke of Monmouth, and paſſed over to Scotland to aſſemble his friends: but diſappointed in his expectations of ſupport, he was taken priſoner, and beheaded at Edinburgh upon his former unjuſt ſentence, June 30, 1685. Under his misfortunes he manifeſted great firmneſs and ſelf-poſſeſſion; he ate his dinner cheerfully on the day of his death, and, according to his uſual cuſtom, ſlept after it for a quarter of an hour or more very ſoundly; at the place of execution he made a ſhort, grave, and religious ſpeech; he cauſed the poſition of the block to be duly adjuſted; and after a ſolemn declaration, that he forgave all his enemies, he ſubmitted to death with extraordinary reſolution and compoſure. Biog. Brit.

**Campbell, Archibald**, firſt duke of Argyle, was the ſon of the preceding, and a very active promoter of the revolution. He accompanied the prince of Orange to England; was admitted into the convention as earl of Argyle, though his father's attainder was not reverſed; and in the Claim of Rights, the ſentence againſt him was declared to be, what it undoubtedly was, "a reproach upon the nation." When it was carried in the Scottiſh convention, that the crown ſhould be eſtabliſhed on the prince and princeſs of Orange, he was ſent from the nobility, together with ſir James Montgomery, and ſir John Dalrymple, from the barons and boroughs, to offer the crown in the name of the convention, to their majeſties, and to tender them the coronation oath. For this and other eminent ſervices, he was admitted a member of the privy-council, and in 1690, made one of the lords of the treaſury. He was afterwards appointed a colonel of the Scots horſe-guards; and, in 1694, one of the extraordinary lords of ſeſſion. He was likewiſe created duke of Argyle, marquis of Kintyre and Lorn, earl of Campbell and Cowell, viſcount of Lockow and Glengla, lord of Inverary, Mull, Morvern, and Ferrey, by letters patent, bearing date the 23d of June, 1701. He ſent over a regiment to Flanders, for king William's ſervice, the officers of which were of his own name and family, who bravely diſtinguiſhed themſelves through the whole courſe of the war. Biog. Brit.

**Campbell, John**, ſecond duke of Argyle, and alſo duke of Greenwich and baron of Chatham, ſon of the preceding, by Elizabeth daughter of ſir Lionel Talmaſh, was born on the 10th of October, 1678, and betimes devoted to a military life. At the age of 17 years, he was appointed by king William to the command of a regiment of foot, with which he ſerved abroad. In 1703 he ſucceeded to the honours and eſtates of his father; and in 1705 he was nominated lord high commiſſioner to the parliament of Scotland. In 1706 he made a campaign under the duke of Marlborough, and diſtinguiſhed himſelf by his courage and conduct on ſeveral occaſions. On his return to Scotland, he promoted the meaſure of the Union, and incurred ſome degree of unpopularity among his countrymen. In the years 1708 and 1709, he performed ſeveral important ſervices in his military capacity on the continent; in recompence of which he was, in 1710, inſtalled a knight of the garter. Having joined the tory-party, he was, in the following year, appointed ambaſſador extraordinary and plenipotentiary to Charles III. king of Spain, and commander in chief of her majeſty's forces in that kingdom. But by illneſs and want of ſufficient ſupport, he was diſabled from attempting any enterpriſe of importance; and, indeed, the peace of Utrecht ſoon after put an end to hoſtilities. In 1712 he was appointed commander in chief of all the land forces in Scotland; but as he oppoſed the meaſures of the miniſtry, by reſiſting the reſumption of the grants of crown-lands, by cenſuring the peace of Utrecht, by remonſtrating againſt the extenſion of the malt-tax to Scotland, and by ſupporting a bill for diſſolving the union, which he had once zealouſly promoted, he was deprived of all his employments under the crown. However, on the acceſſion of George I. in 1714, they were reſtored to him with ſeveral additional offices of honour and ſervice. In the rebellion of 1715, he had the command of the king's troops in Scotland; and at length compelled the rebels to abandon Perth, and the pretender to quit the kingdom. From this time his political conduct was fluctuating and verſatile; being occaſionally in and out of place, ſometimes ſupporting, and ſometimes oppoſing the miniſtry; at one time condemning, and afterwards defending ſtanding armies. In 1718 he was ſo much in favour as to be advanced to the dignity of a duke of Great Britain, by the title of duke of Greenwich. He afterwards, at different periods, occupied the poſts of lord ſteward of his majeſty's houſehold, maſter-general of the ordnance, and field-marſhal of all his majeſty's forces. In 1739 he vigorouſly oppoſed the adminiſtration of ſir Robert Walpole, and was removed from all his places; but regained them in 1741, when that miniſter was diſplaced. Some diſguſt at the political arrangements which then took place, induced him very ſoon to reſign them. A paralytic diſorder with which he had been for ſome years afflicted, terminated his life in September 1743; and he was interred in Weſtminſter Abbey, where a ſplendid monument, executed by Roubiliac, was erected to his memory, ſome years after his deceaſe. The titles of duke and earl of Greenwich, and baron of Chatham, became extinct at his death; but his Scottiſh titles devolved on his brother Archibald, earl of Ila. His memory has been uſually honoured with the title of the *great* duke of Argyle; and he has been celebrated in very high terms both by Pope and Thomſon. The encomium of the latter, in his Autumn, is diffuſe: that of the former is more conciſe:

"Argyle, the ſtate's whole thunder born to wield,
And ſhake alike the ſenate and the field."
Epilogue to the Satires, dial. ii.

His character is leſs favourably ſketched by Mr. Macpherſon in his "Hiſtory of Great Britain, vol. ii. p. 601." Careleſs and eager in his diſpoſition, he neither concealed his reſentment nor diſguiſed his deſigns. With a commanding manner, which ſtamped his very forwardneſs with an appearance of authority, he was feared by many, but beloved by none. Brave in his perſon, but not remarkable for his conduct; he might be conſidered, in his military capacity, as a bold partizan rather than a judicious commander. In his civil character, his fire degenerated into a violence, that often defeated his views. In his public exhibitions in parliament, he was rather ſpirited than eloquent; better calculated to terrify his enemies than to ſupport his friends. His great defect was a love of money and emolument, which he could not effectually conceal, with all the efforts of his pride. His chief talent was an addreſs in managing the prejudices of the vulgar. He marked their opinions as they changed, and fell dexterouſly down with the tide." In private life he is allowed to have been an affectionate huſband, and an indulgent maſter, a liberal friend to the poor, and a generous patron of merit in diſtreſs. As a ſtrict economiſt, he took care to maintain the dignity of his rank, without waſting any part of his income in empty pomp, or unneceſſary expences. Biog. Brit.

**Campbell, Archibald**, third duke of Argyle, was born at Ham-houſe in England, in 1682, and educated at the univerſity of Glaſgow. Although he ſtudied law at Utrecht with a view to the bar, he declined purſuing it, and devoted himſelf to a military life. But he ſoon abandoned the army, and determined on acquiring the neceſſary qualifications for a ſtateſman. Accordingly, he occupied ſeveral poſts of truſt and dignity in Scotland, which we ſhall not here enumerate. As chancellor of the univerſity of Aberdeen, he laboured to promote the intereſt of that, as well as of the other univerſities of Scotland; and he particularly encouraged the ſchool of phyſic at Edinburgh, which has ſince acquired ſuch high reputation. He was a man of great natural and acquired endowments, well verſed in the laws of his country, eminent for his knowledge of human nature, and poſſeſſed of very conſiderable parliamentary abilities. As he had the chief management of Scots affairs, he was very attentive to promote the trade and manufactures of Scotland, and to forward improvements for the good of the country. He excelled in converſation, and collected one of the moſt valuable private libraries in Great Britain. At Inverary he built for himſelf a very magnificent ſeat. Having retained his faculties in full vigour till his 79th year, he died ſuddenly in April, 1761; and was ſucceeded in his titles and the eſtates of his family by John Campbell, fourth duke of Argyle, ſon of the honourable John Campbell of Mammore, who was the ſecond ſon of Archibald, the ninth earl of Argyle. Biog. Brit.

**Campbell, John**, an ingenious writer, was the fourth ſon of Robert Campbell of Glenlyon, Eſq., and was born at Edinburgh in 1708. At the early age of five years, he was brought by his mother to Windſor, where her father reſided, and at a ſuitable age articled to an attorney. But the ſtudy of the law not ſuiting his taſte, he devoted himſelf to a literary life, and in due time engaged in the profeſſion of an author, in which he acquired eminence. His earlieſt productions are not now known; but in 1736, he publiſhed in 2 volumes folio, "The military Hiſtory of Prince Eugene and the Duke of Marlborough, &c." The reputation which he acquired by this performance, occaſioned his being employed in the compilation of the "Ancient Univerſal Hiſtory," in which he wrote, beſides other parts that are not poſitively aſcertained, the Coſmogony. The firſt work to which he prefixed his name, was "The Lives of the Engliſh Admirals, and other eminent Britiſh Seamen," of which 2 volumes were publiſhed in 1742; and the two remaining volumes were completed in 1744. This work was ſo well received, that it paſſed through three editions in the author's own life-time, and a fourth has been ſince reprinted under the inſpection of Dr. Berkenhout. His curious and entertaining pamphlet, entitled "Hermippus Redivivus, or the Sage's Triumph over old Age and the Grave; wherein a Method is laid down for prolonging the Life and Vigour of Man," was publiſhed in 1743. This ſecret is founded upon an ancient inſcription preſerved in Reineſius's ſupplement to Gruter, and conſiſts in inhaling the breath of young females. Campbell's tract had its origin in a foreign publication, which ſuggeſted the idea, improved by our author with additional learning, and in a ſtrain of grave irony, which made it doubtful whether he was in jeſt or earneſt. According to his account, indeed, the true key of the work was an imitation of Bayle's manner of writing on a difficult ſubject, without diſcovering to which ſide his own ſentiments inclined. In 1744, he publiſhed in 2 volumes folio, a much improved edition of "Harris's Collection of Voyages and Travels," which was very favourably received. The next work in which Mr. Campbell engaged, was the "Biographia Britannica," the publication of which commenced in 1745; and his articles are allowed to conſtitute the principal merit of the four volumes through which they extend. With regard to the extent of his reſearch, and the variety of information which he communicates, as well as the correct and animated ſtyle, generally elegant, though ſomewhat too diffuſe, in which he writes, he ſurpaſſes his coadjutors in that comprehenſive and uſeful work. If he errs, it is on the ſide of candour, and a freedom from party-prejudice, which have ſometimes degenerated into a ſyſtem of univerſal panegyric or apology. To the benevolence of his temper, and in ſome caſes to his ſuperior knowledge, and not to any intention of flattering or deceiving, this error ought to be aſcribed. To Mr. Dodſley's "Preceptor," which appeared in 1748, Mr. Campbell contributed the introduction to chronology, and the diſcourſe on trade and commerce. In 1750, he publiſhed the firſt ſeparate edition of his "Preſent State of Europe," which became very popular, and which contains, in a moderate compaſs, a great variety of hiſtorical and political information. The next great undertaking, in which our author's abilities and learning were eminently diſplayed, was "The Modern Univerſal Hiſtory," to which he contributed the hiſtories of the Portugueſe, Dutch, Spaniſh, French, Swediſh, Daniſh, and Oſtend ſettlements in the Eaſt Indies, and the hiſtories of the kingdoms of Spain, Portugal, Algarve, Navarre, and that of France, from Clovis to the year 1656. As our author had thus diſtinguiſhed himſelf in the literary world, the degree of LL. D. was very properly and honourably conferred upon him, in 1754, by the univerſity of Glaſgow. During the intervals of his greater labours, ſeveral ſmaller and anonymous works proceeded from his fertile pen. Among theſe, we may reckon his "Deſcription and Hiſtory of the new Sugar Iſlands in the Weſt Indies," which was written upon the concluſion of the peace of Paris, at the requeſt of lord Bute, as a vindication of that peace. This treatiſe was deſigned to ſhew the value and importance of the neutral iſlands that had been ceded to us by the French. It was preſented to his majeſty with a MS. dedication. It was probably in recompence of his political ſervices, that he was appointed in 1765 his majeſty's agent for the province of Georgia, in North America, which employment he held till his deceaſe.

The laſt and great work of Dr. Campbell, to which he had devoted many years of his life, was his "Political Survey of Britain," which appeared in 2 vols. 4to. in 1774. In this work, the author's patriotiſm and the extent of his knowledge were eminently diſplayed; but though it muſt be allowed to contain numerous plans and hints of improvement, which duly regarded would contribute to preſerve and perpetuate the proſperity of this iſland, ſome of its projects are founded on erroneous principles, others are of queſtionable importance and utility, and the reader, who wiſhes to acquire a juſt knowledge of the ſtate of theſe kingdoms, ſhould conſult it with caution. The diſcuſſions to which it leads engaged the author in a very extenſive correſpondence; and he derived from it a very conſiderable increaſe of reputation. Dr. Campbell's literary character was highly reſpected not only in his own country, but in the remoteſt parts of Europe. To this purpoſe it may be mentioned, that the empreſs of Ruſſia, in 1774, condeſcended to honour him with the preſent of her picture, drawn in the robes worn in that country in the days of John Baſilowitz, grand duke of Muſcovy, who was contemporary with queen Elizabeth. In return, the author conveyed to St. Peterſburg a ſet of the "Political Survey of Britain," bound in morocco, highly ornamented, and accompanied with a letter deſcriptive of the triumphs and felicities of her reign.

As Dr. Campbell's literary engagements allowed of few foreign avocations, his life was ſedentary and domeſtic; but by exerciſe in his garden and houſe, and a courſe of temperance and abſtemiouſneſs, he guarded againſt the inconveniences incident to this kind of life, and enjoyed a good ſtate of health, though his conſtitution was delicate. His general reputation, and his inſtructive, chearful converſation, drew to his houſe, particularly on a Sunday evening, a great number of literary friends and perſons of all ranks and profeſſions, who were deſirous of teſtifying their reſpect for his merit, and of deriving improvement and pleaſure from intercourſe with him. His knowledge was far from being reſtricted to thoſe ſubjects which employed his pen as an author; but he was well acquainted with mathematics and medicine, with the ancient and modern languages, and with the different parts of ſacred literature. His memory was ſingularly retentive; and he had an uncommon facility in communicating his ideas. The ſtyle of his works had been formed upon the model of that of biſhop Sprat, and was perſpicuous, eaſy, flowing, and harmonious. "To all theſe accompliſhments of the underſtanding, he joined the more important virtues of a moral and pious character. His diſpoſition was gentle and humane, and his manners kind and obliging. He was the moſt tender huſband, a moſt indulgent parent, a kind maſter, a firm and ſincere friend. To his great Creator, he paid the conſtant and ardent tribute of devotion, duty, and reverence; and in his correſpondence he ſhowed that a ſenſe of piety was always neareſt his heart." It was our author's cuſtom every day to read one or more portions of ſcripture in the original, with the ancient verſions, and the beſt commentators before him; and in this way, as appears from his own occaſional notes and remarks, he went through the ſacred writings a number of times with great thankfulneſs and advantage. His ſevere ſtudy at length brought on a decline which terminated his life, December 28, 1775, when he had nearly completed the 68th year of his age. Biog. Brit.

CAMPBELL, GEORGE, an eminent metaphyſician, divine, and biblical critic, was the youngeſt ſon of Mr. Colin Campbell, one of the miniſters of Aberdeen, and born in that city, December the 25th, 1719. Although he had the misfortune to loſe his father at an early age, he made a conſiderable proficiency in the Latin and Greek claſſics at the grammar ſchool, and Mariſchal college of his native place. It was his original intention to follow the profeſſion of the law, and with this view he actually ſerved an apprenticeſhip with a writer to the ſignet in Edinburgh. But being ſoon diſguſted with this employment, he directed his attention to the ſtudy of the ſcriptures, and determined to acquire the qualifications that were neceſſary for the office of a clergyman. Accordingly, in 1741, before the term of his apprenticeſhip was fully completed, he attended the divinity lectures of profeſſor Gobdie at Edinburgh; and he afterwards entered himſelf, as a ſtudent of theology, both in King's college, under the care of profeſſor Lumſden, and in Mariſchal college, under the tuition of profeſſor Chalmers. Beſide the advantages which he enjoyed at the univerſity for the proſecution of his theological ſtudies, he belonged to a literary ſociety of 14 learned perſons, which was eſtabliſhed in 1742, and which afforded him additional means and opportunities of improvement.

After completing his ſtudies at the univerſity, and paſſing through the uſual trials before the preſbytery of Aberdeen, Mr. Campbell was licenſed as a probationer, or preacher, in 1746: and two years after he was ordained miniſter of Banchory-Teman, 17 miles W. from Aberdeen. In this ſituation he excelled as a Scripture critic and lecturer; and compoſed a variety of diſcourſes, which were diſtinguiſhed by the ſimplicity and perſpicuity of their ſtyle. Here he formed the plan of his Tranſlation of the four Goſpels, and here he alſo drew up a part of his Philoſophy of Rhetoric. During his ſettlement in this country pariſh, he married a lady, who contributed in a very great degree to the prolongation and happineſs of his life. In June 1757 he was tranſlated to Aberdeen, and became one of the miniſters of that city, where his character as a lecturer was fully eſtabliſhed, and where he delivered a variety of ingenious and learned diſcourſes on rhetoric, criticiſm, and other ſubjects, in a literary ſociety, projected on a larger ſcale than that to which he had formerly belonged, by the late Dr. Reid of Glaſgow, and Dr. Gregory, who were at that time profeſſors of King's College, and eſtabliſhed in 1758. His firſt publication was a ſermon, preached in 1752, at the opening of the ſynod in Aberdeen, on the character of a miniſter, as a teacher and pattern; but as he probably thought that the ſtyle of this diſcourſe was too highly ornamented, he did not include it in the number of ſermons, which he collected a few years before his death. In 1759 he was preſented by his majeſty to the office of principal of Mariſchal College, then vacant by the death of principal Pollock. His advancement to this honourable office was partly owing to the intereſt of Archibald duke of Argyle, to whoſe family he was related, and partly to his known character as a man of diſtinguiſhed abilities and literature. Soon after his appointment to this office, he publiſhed his celebrated "Diſſertation on Miracles," in anſwer to Mr. Hume's eſſay on this ſubject, and thus deſervedly gained the reputation of a moſt acute metaphyſician, and a well-bred polemical writer. The ſubſtance of it was delivered in a ſermon before the provincial ſynod of Aberdeen in 1760, and afterwards moulded into the form of a diſſertation. Before it was publiſhed a copy of it was ſent to Dr. Blair of Edinburgh, and communicated to Mr. Hume; and when the author had availed himſelf of the remarks both of his friend and of his opponent, he preſented it to the public in 1763. Mr. Hume, in a letter addreſſed to the author, acknowledged the civil and obliging manner in which he had been treated; and the Diſſertation was ſo well received by the public, that it ſoon paſſed through ſeveral editions, and was tranſlated into the French, Dutch, and German languages. For a particular account of the author's reaſoning in this diſſertation, ſee our article MIRACLES. Some time before the publication of this treatiſe, the author, without any ſolicitation on his own part, received the degree of doctor of divinity from the neighbouring Univerſity of King's College in Old Aberdeen: a title which he was more ambitious to deſerve than to obtain. Dr. Campbell continued for 12 years to diſcharge the offices of principal of Mariſchal College, and of one of the miniſters of Aberdeen; which he did with great honour to himſelf and ſatisfaction to theſe with whom he was connected. During this period he amuſed himſelf with the ſtudy of botany, in which he became a great proficient; and beſide acquiring a conſiderable knowledge of Hebrew, as well as improving his acquaintance with the Greek and Latin, he made himſelf maſter of the French and Italian, ſo as to become a critic in theſe languages. In 1771 he was elected, by the town-council of Aberdeen, profeſſor of divinity in Mariſchal College in the room of Dr. Gerard; and though he reſigned his paſtoral charge as one of the miniſters of Aberdeen, the united offices of principal and profeſſor of

Mariſchal College devolved upon him a variety of duties, which required great application and exertion. As profeſſor of divinity he nearly doubled the number of lectures which the ſtudents had been accuſtomed to receive, and he finiſhed his courſe in four years, ſo that every ſtudent had an opportunity, if he thought proper, of attending the whole of it. His prelections, in the plan or outline of them, were equally ſimple and comprehenſive. They contained, under the theoretical part, every thing that the ſtudent of divinity ſhould know; and, under the practical branch, every thing that he ſhould do, as a reader of ſacred and church hiſtory, a ſcripture critic, a polemic divine, a pulpit orator, a miniſter of a pariſh, and a member of the church courts on the Scotch eſtabliſhment.

Under the firſt head, or *theory*, he included ſacred or church hiſtory, ſacred criticiſm, and polemic divinity. On ſacred or church hiſtory he delivered thoſe prelections, which he afterwards prepared for the preſs, and which were publiſhed after his death by the Rev. George Skene Keith, in 1800, under the title of "Lectures on Eccleſiaſtical Hiſtory," 2 vols. 8vo. On the ſubject of Scripture criticiſm, inſtead of a tedious and uninteresting diſcuſſion of many ſeparate and minute particulars, he laid down general rules or canons, by which the ſtudents themſelves might be critics without depending upon any commentator. Theſe canons were publiſhed in his Tranſlation of the four Goſpels. His general directions with regard to polemic divinity may be ſummed up in the following ſentences, which, being expreſſed in the moſt ſimple and conciſe language, may be ſoon read and eaſily remembered. We ſhall tranſcribe them for the benefit of thoſe readers whom they may more immediately concern. "Begin with ſtudying the Scriptures in the original languages; attend carefully to the diſtinction, that ſhould always be made, between claſſical or pure Greek, and the Greek of the Septuagint and Teſtament, where the words, taken ſeparately, are pure Greek, but where the idiom of the language, and even the acceptation of many of the words, is derived from the Hebrew, the Chaldaic, or the Syriac. Be acquainted with the civil hiſtory, the manners and cuſtoms of ancient times and nations, eſpecially with that of the Jews, where the reading of Joſephus will often be uſeful. But whatever books you read occaſionally, read the Scriptures frequently. Mark the different paſſages which you do not underſtand; read them with patience, not being too anxious to underſtand every thing at the firſt reading over. But perſevere and read the Scriptures in the original, a ſecond and a third time; and, without conſulting any commentator, thoſe difficult paſſages will always become fewer as your knowledge increaſes. Read the Scriptures alſo with modeſty, neither being too full of yourſelf, nor ſuppoſing that human reaſon can always comprehend divine myſteries: and read them always with fervent prayer to God, the ſource of wiſdom and light, that he would aſſiſt and direct you in your reſearches after truth. Do not complain that you want books, when you have the Scriptures themſelves in the original languages. If you have a Hebrew Bible, a Septuagint, and a Greek New Teſtament, you have the moſt neceſſary, and the moſt uſeful, of all books to a Chriſtian divine. Read carefully all the verſions which are given of diſputed paſſages; make much uſe of verſions, and compare them all carefully with the original. Read the Vulgate, though a tranſlation authorized by the Romiſh church, as well as the verſions of individuals, ſuch as Caſtalio, Beza, Junius, and Tremellius; and alſo Houbigant, if you have acceſs to his tranſlation. You cannot be hurt by reading verſions, and comparing them with the original. But put no confidence in commentators. Conſult them ſparingly, never uſe them till the laſt, and then uſe them only as dictionaries. In this view, however, read commentators of all parties; and judge of them more from their freedom of thought, abilities, and erudition, than from conſidering to what party they belong. In comparing the different kinds of commentators with one another, remember, that paraphraſts are the worſt, becauſe they undertake too much or promiſe moſt; while ſcholiaſts are the beſt, becauſe they undertake and promiſe leaſt. Be on your guard againſt too much ingenuity in commentators: for genius, in this caſe, has often led them aſtray, where humble piety, and plain common ſenſe, would have kept them in the right path. Beware particularly of any attachment to a pre-conceived ſyſtem; and do not think, that you will be ſafe, if you uſe what you call an approved commentator. (It is a pity, though there were leſs danger of being miſled, that a young man of taſte, learning, and genius, ſhould be chained to the opinions, or kept in the trammels, of a commentator.) See always with your own eyes, and not through the ſpectacles of gloſſariſts, commentators, or paraphraſts. Remember that your errors will be much more pardonable, when you uſe your own eyes, and when you come ſhort of the truth, after making the beſt uſe of your own reaſon, than when ye are led implicitly by paſſion, or by prejudice. Let your religious ſyſtem be the laſt thing that ye make; or where ye have made one in early life, be ſtill correcting it, as you acquire more knowledge—not contending for the opinions of men, but enquiring after the mind of the Spirit."

Under the ſecond general head, viz. *Practice*, or the practical part of theology, Dr. Campbell delivered ſeveral excellent prelections to the ſtudents, comprehending pulpit eloquence (See Eloquence), propriety of character in private life, or teaching by example, and propriety of character in public conduct. His manner of delivering theſe lectures was ſuch as to captivate and fix the attention of his ſtudents. His deep and extenſive erudition was irradiated by his fine imagination; and thoſe prelections, which were the moſt abſtracted and learned, were rendered entertaining by ſtrokes of wit and humour which Dr. Campbell took occaſion to introduce. Beſides, he recommended himſelf to the ſtudents, not only by the juſtneſs of his criticiſm, and by his lively mode of lecturing, but by the condeſcenſion and amiableneſs of his whole conduct.

Dr. Campbell, in his 72d year, was ſeized with a ſevere illneſs, which threatened his life; but, contrary to his own expectations and thoſe of his friends, he recovered; and though his bodily ſtrength was impaired, he reſumed his former occupations and ſtudies. Some years before his death he made a diſintereſted and unſolicited offer of reſigning his profeſſorſhip of divinity, provided that any one of thoſe gentlemen whom he named, and to whom he applied for their conſent, were choſen to ſucceed him. The offer, however, was not accepted by the patrons of the profeſſorſhip, and he conſented to retain it, leſt an improper perſon ſhould, in his life-time, be choſen as his ſucceſſor. But when application was made to him, and alſo to the town-council of Aberdeen (the patrons of the profeſſorſhip) in favour of Dr. William Laurence Brown, late miniſter of the Engliſh church, and profeſſor of moral philoſophy, of the law of nature, and of eccleſiaſtical hiſtory, in the Univerſity of Utrecht, who had been driven from theſe offices in conſequence of the French invaſion, he inſtantly reſigned, in 1795, his charge of profeſſor of divinity and miniſter of Gray Friars, which were worth 160l. a year; and expreſſed much ſatisfaction in the appointment of his ſucceſſor. Soon after his reſignation of the profeſſorſhip, government, deſirous of teſtifying, in a public manner, the high reſpect ſo juſtly entertained of his abilities and ſervices, offered him, on condition of reſigning the principalſhip of Mariſchal College, a penſion of 300l. a year. Dr. Campbell accepted this token of his majeſty's munificence, and was ſucceeded in the office of principal alſo by Dr. Brown. This penſion, however, he did not long live to enjoy; though he continued writing till within a week of his death; an event, which he expected with great tranquillity and compoſure. On the 31ſt of March, 1796, after ſome previous ſymptoms of uneaſineſs, he was ſtruck with the palſy, which deprived him of ſpeech, and under which he languiſhed for a few days till he died. He had long accuſtomed himſelf to prepare for death; in a former illneſs he had given the teſtimony of a dying man in favour of religion; and, therefore, he was peculiarly happy in not feeling the pangs of diſſolving nature. A funeral ſermon was preached, on occaſion of his death, by Dr. Brown, in which he has given a ſketch of his character as a public teacher, as the head of a public ſeminary of learning, and as a private chriſtian. His character is thus ſummed up in a few ſentences by his biographer, Mr. Keith. "His imagination was lively and fertile—his underſtanding equally acute and vigorous—and his erudition was at once very deep and wonderfully diverſified. His piety was unfeigned—his morals unimpeached—his temper chearful—and his manners gentle and unaſſuming. His love of truth was even more remarkable than the uncommon ſucceſs with which he fought after it. Where intuitive faculties could be of ſervice to any man, he ſaw at once if he ſaw at all. But his deep perſpicacity was not ſatisfied with a ſuperficial view of any thing: his piercing eye darted to the bottom of every ſubject, to which diſcernment could be applied. Where ſtudy and reflection were neceſſary, he could beſtow as much time on patient thinking, as if he had been poſſeſſed of no genius at all, and had acquired only a ſmall ſhare of erudition. And when once he began to examine any ſubject, he was never ſatisfied till he had viewed it in every light in which it could be ſeen. He always ſought for truth in the love of truth, but he could not bear to be ſuſpected of deviating from it; for he neither courted thoſe who might ſupport, nor feared thoſe who did oppoſe him. The tone of his mind was high, and he would not let it down from the elevation of truth and of virtue. Whether engaged in converſation, or employed in ſtudy, he could paſs eaſily from the lighteſt ſubject to the moſt ſerious one. And the reach of his mind was ſo great, as to comprehend a great variety of ſubjects. He could explore the cauſes of that pleaſure, which ariſes in the mind, from dramatic entertaiments, and lay down the rules of Scripture criticiſm. He could illuſtrate the whole theory of evidence, or detect the falſe reaſonings of Mr. Hume. He could explain the ſpirit of the Goſpel, marking the extremes of ſuperſtition and enthuſiaſm; and both as a philoſopher, and a divine, declare the nature, extent, and importance, of the duty of allegiance. While he zealouſly contended for the faith, he could warn the Chriſtian againſt imbibing a perſecuting ſpirit and yet ſhow the influence of religion upon civil ſociety, warning his countrymen againſt infidelity, before they had ſeen its dreadful effects. He could, with manly eloquence, deſcribe the ſucceſs of the fiſhermen of Galilee, while preaching the doctrine of the croſs to prejudiced Jews, learned Greeks, and ambitious Romans; and at the ſame time, with well applied erudition, he could delineate the characters of the pretended ſucceſſors of the apoſtles, and trace the progreſs of the hierarchy through all the dark and middle ages, until the reformation of religion. As the principal of a college, a profeſſor of divinity, or a miniſter of the Goſpel,—as a true patriot, a good man, and a ſincere Chriſtian; *Quando ullum invenies parem?*"

His different publications in chronological order, beſide the Diſſertation on Miracles, and a ſingle Sermon already mentioned, are as follow:—In 1771 he preached before the Synod of Aberdeen his ſermon on the Spirit of the Goſpel, in which he ſtruck at once both at fanaticiſm and ſuperſtition, and at fanatics and ſuperſtitious perſons of all parties and deſcriptions. In 1776 he publiſhed his "Philoſophy of Rhetoric," which eſtabliſhed his reputation, as an excellent grammarian, an accurate and judicious critic, a man of fine imagination and delicate taſte, and a philoſopher of great acuteneſs and deep penetration. The two firſt chapters of this book had been compoſed as early as 1750; and a remarkable coincidence had taken place between him and Dr. Beattie, on the ſubjects of wit, humour, and ridicule. In 1776 he preached a ſermon on the National Faſt, occaſioned by the American war, in which he diſcuſſes the nature, extent, and importance of the duty of allegiance, and which was very popular. Six thouſand copies of it were afterwards publiſhed at the deſire of dean Tucker, and circulated through America. Although in this ſermon he maintains, that the Britiſh colonies in America had no right, either from reaſon or from Scripture, to throw off their allegiance, he inſinuates that America ſhould be allowed to be independent rather than that Great Britain ſhould continue the war. In 1777 Dr. Campbell publiſhed a ſermon on the ſucceſs of the firſt publiſhers of the Goſpel conſidered as a proof its truth, before the ſociety for propagating Chriſtian knowledge, in which he ſtates this argument for the truth of Chriſtianity in a very forcible manner. In 1779 he publiſhed an addreſs to the people of Scotland, on the alarms which had been raiſed by the bill in favour of the Roman Catholics; in which addreſs he conſiders the doctrine of the Goſpel with regard to perſecution; the concluſions to which found policy would lead us in the toleration of the papiſts; and the proper and Chriſtian expedients for promoting religious knowledge, and repreſſing error. This addreſs exhibits a ſtriking evidence of the liberality of the author's mind, with reſpect to thoſe who differed from him in opinion, and of his diſlike of every ſpecies of intolerance and perſecution. In the ſame year he publiſhed a ſermon on the happy influence of religion on civil ſociety, which was preached at the aſſizes at Aberdeen. In this valuable diſcourſe the preacher has ſhewn, in the moſt ſatisfactory manner, that "religion is highly conducive to the exaltation and felicity of the body politic, or nation, by the tendency and extent of its laws, by the aſſiſtance which it gives to the civil powers, both in ſecuring fidelity and in diſcovering truth; by the nature and importance of its ſanctions; by the poſitive enforcement of equity and good government on the rulers, and of obedience and ſubmiſſion in the people." The laſt work which Dr. Campbell lived to publiſh, was his "Tranſlation of the Four Goſpels, with preliminary Diſſertations and explanatory Notes," in two 4to. volumes. His poſthumous work, entitled "Lectures on Eccleſiaſtical Hiſtory," has been already mentioned. See Keith's Account of the Life and Writings of Dr. George Campbell, prefixed to his "Lectures."

**Campbell**, in *Geography*, a county of America, in the ſtate of Virginia, lying E. of Bedford county, on Staunton river. It is 45 miles long and 30 broad; and contains 7685 inhabitants, including 2488 ſlaves.

**Campbell's** *fort*, a fort of America, in the ſtate of Tenneſſee, near the junction of Holſton river with the Tenneſſee; 135 miles from Abingdon, in Waſhington county, Virginia, and 445 W. of Richmond in Virginia.

**Campbell's** *ſalines*, a tract of country in America, in North Holland, in the ſtate of Tenneſſee, diſcovered by captain Charles Campbell, who obtained a patent for it in 1753 from the governor of Virginia. Since the diſcovery of ſalt-water, and the manufacture of ſalt in this diſtrict, it is become very valuable, and many thouſands of people are now ſupplied from it with ſalt of a ſuperior quality, and at a low price. It conſiſts of about 300 acres of ſalt marſh land, in which pits are ſunk for obtaining the ſalt water. The beſt is found at the depth of from 30 to 40 feet; and after paſſing through the rich ſoil or mud, from 6 to 10 feet, you come to a very brittle lime-ſtone rock, with cracks or chaſms, through which the ſalt-water iſſues into the pits, whence it is drawn by buckets and put into the boilers, which are placed in furnaces adjoining the pits. The hills, that ſurround this flat, are covered with fine timber; and a coal-mine has been diſcovered not far from it.

**Campbell**-*town*, is a royal borough in the county of Argyle, Scotland, ſeated on the banks of the lake of Kilkerran, on the eaſtern ſhore of Kintyre, of which it is the preſbytery ſeat. This place was merely a ſmall fiſhing village till 1701, when it was conſtituted a royal borough, and obtained its preſent appellation. Previous to that period it was called Ceann-loch (Loch-head) which it ſtill retains in the provincial language of the country. From the eſtabliſhment of a fiſhery here, and the advantage of a good harbour, this place has greatly increaſed in ſize and conſequence. The harbour is about two miles long by one broad, and aſſumes the form of a creſcent. It is ſurrounded by high hills, and protected at the entrance by an iſland. The anchorage is good, and meaſures from ſix to ten fathoms water. It is appointed the rendezvous of the buſſes employed in the herring-fiſhery, which is the principal trade of the place. Beſide the fiſhery, here is a conſiderable trade in the diſtillation of whiſkey. The pariſh of Campbell-town is about 11 miles by 8, and includes the greateſt portion of the diſtrict called Kintyre. It is narrowed in the middle by the bay of Machyr-haniſh on one ſide, and the loch of Kilkerran, or harbour of Campbell-town, on the other. The ſoil of the pariſh is various, but the arable land is well cultivated and fertile. At the diſtance of three miles are ſome coal-pits, and a canal has lately been finiſhed to communicate with the collieries and the town. A quantity of fuller's earth, or a kind of ſoapy rock, is obtained in this pariſh. In 1791 the population amounted to 8700. This town, with Air, Irvine, Inverary, and Rothſay, unite in ſending one member to the imperial parliament. It lies 176 miles W. by S. from Edinburgh.

**Campbell**-*town*, a large and flouriſhing town of America, in North Carolina, ſeated on a branch of Cape Fear river, 100 miles above Wilmington; the reſort of many inhabitants and travellers, who carry on a continual commerce by waggons, from the back ſettlements, with large trading boats.—Alſo, a village in Dauphin county, Pennſylvania, ſeated near a water of Quitipihilla creek; 13 miles E. of Harriſburgh, and 96 N. W. of Philadelphia.

**CAMPDEN**, or **Campden-Chipping**, anciently *Câmpedene*, is a borough and corporate town of Glouceſterſhire, England, ſituated in a fertile valley, ſurrounded by cultivated hills and hanging woods. Its remote origin may be inferred from the circumſtance of the Saxon kings aſſembling here, in the year 687, to conſult on the mode of carrying on the war with the Britons. The era, however, in which it attained the greateſt importance, was the 14th century, when it became a principal mart for wool, and the reſidence of many opulent merchants, who exported that commodity to Flanders, which was then the ſeat of the manufacture of cloth for the general ſupply of Europe. After the eſtabliſhment of this trade in England, and the more general diffuſion of the wool buſineſs, Campden was gradually deprived of its conſequence; and both the merchandiſe and manufactures of early days are now totally loſt. In a charter granted by James I. in the year 1605, it is ſtated that this town was an ancient vill, and originally incorporated: it is therein ordered, that its government ſhould in future be veſted in two bailiffs, twelve capital, and twelve inferior burgeſſes, a ſteward, &c. By the charter, the bailiffs and ſteward were empowered to hold a court of record every fourth Friday, and to take cognizance of all pleas of treſpaſs, debt, contract, and fraud, within the borough; provided the reſpective actions were for ſums not exceeding 6l. 13s. 4d. The buildings are principally ranged in one ſtreet, nearly a mile in length; about the middle of which are the court and market houſes. The former is an ancient ſtructure; and the latter was erected, by ſir Baptiſt Hickes, in the year 1624. A capacious manſion, yet remaining, of nearly the ſame age as the court-houſe, is ſaid to have been erected as a reſidence for one of the wool-merchants. The church, dedicated to St. James, ſtands on an eaſy eminence above the town, in the hamlet of Berrington, which tradition affirms to have received its name from the tumuli, or barrows raiſed over the bodies of thoſe who were ſlain in a great battle fought here between the Mercians and the Weſt Saxons; whoſe reſpective encampments are ſaid to have been at Willerſey and Meen-hill in this vicinity: a bridge at Berrington now bears the name of Battle-bridge. The church is an elegant ſtructure, and conſiſts of a ſpacious nave, 60 feet high, with an aiſle on each ſide, a chancel, and a tower at the weſt end, 120 feet high, ornamented in a very chaſte ſtyle. At the eaſt end of each aiſle is a chapel; that on the ſouth ſide is the burial place of the families of Hickes and Noel. To the munificence of the wool merchants, in the flouriſhing period above-mentioned, it is probable that this beautiful building owed its erection: ſeveral of them are here interred, with braſs effigies and memorials. Near the church are ſome remains of a very magnificent manſion, erected by ſir Baptiſt Hickes, ſoon after he purchaſed the manor, early in the 17th century. The population of this pariſh, as returned under the late act, was 1213 perſons, who were chiefly employed in manufactures; the number of houſes 255. Various donations have been made, for the uſe of the poor, and other beneficial purpoſes, particularly by ſir Baptiſt Hickes, whoſe "good deedes done to this towne" have found an accurate regiſter in Stow. Campden is 90 miles N.W. from London; and has a weekly market on Wedneſdays. Among the more diſtinguiſhed natives of this town are Dr. Robert Harris, a celebrated preacher in the intereſt of the commonwealth parliament, and Mr. George Ballard, author of "Memoirs of Britiſh Ladies."

The vicinity of Campden was the theatre of the *Coteſwold Games*, which, in the reigns of James I. and his unfortunate ſucceſſor, were greatly celebrated in this part of England. They were inſtituted by a public-ſpirited attorney, named Robert Dover, of Barton-on-the-Heath, in Warwickſhire, and, like the Olympic games of the ancients, conſiſted of moſt kinds of manly exerciſes. The victors were rewarded by prizes diſtributed by the projector, who for many years ſuperintended the games in perſon. Ben Jonſon, Drayton, and other poets of that age, wrote verſes on this feſtivity. Theſe were collected into one volume, and publiſhed under the title of "Annalia Dubrenſia," in 1636. The breaking out of the civil war terminated theſe diverſions; but the remembrance of them is yet preſerved by an annual meeting of young perſons on Dover-hill, an eminence about half a mile from Campden, where the principal games were celebrated.

CAMPEACHY, a town of America, in Old Mexico, or New Spain, ſituate in the province of Yucatan, on the weſt ſhore of a bay of the ſame name in the gulf of Mexico. Its houſes are well built of ſtone; when taken by the Spaniards, it contained 3000 houſes, and had conſiderable monuments of Indian art and induſtry. It has a good dock and fort, with a governor and garriſon, commanding both the town and harbour. It has been often ſtormed and taken, both by the Engliſh and French Buccaneers, viz. in 1659, 1678, and 1685, at which laſt time theſe freebooters plundered the whole country within 15 miles about it, ſet fire to the fort and town, which the governor would not conſent to ranſom, and burnt to the value of 50,000 l. of Campeachy wood, which was a part of their ſhare of the plunder. The port is large but ſhallow; and it uſed to be a ſtated market for log-wood, of which great quantities grew in the neighbourhood, before the Engliſh landed there, and cut it at the iſthmus, which they entered at Trieſte iſland, near the bottom of the bay, 40 leagues S.W. from Campeachy. The chief manufacture is cotton cloth. N. lat. 19° 30′. W. long. 91° 30′.

CAMPEACHY, or CAMPECHE *Wood*, in *Botany*. See HÆMATOXYLUM *Campechianum*.

CAMPEGGI, LORENZO, in *Biography*, an eminent civilian and prelate of the Romiſh church, was born at Milan in 1474; and having been educated to the profeſſion of the civil law, taught it firſt at Padua, and afterwards at Bologna. After the death of his wife, he entered into the eccleſiaſtical ſtate, and in 1510 was made auditor of the Rota at Rome. In 1512 he was advanced to the biſhopric of Feltre by Julius II. and deputed as his nuncio to Milan and into Germany. In 1517 he was created a cardinal by Leo X.; and in 1519 ſent as legate to England to collect the tenths for the war with the Turks; but he only ſucceeded in obtaining the biſhopric of Saliſbury. In 1524 he was appointed biſhop of Bologna, and delegated by Clement VII. to oppoſe the progreſs of Lutheraniſm in Germany. His legation to Henry VIII. of England, with which he was intruſted in 1528, was a very difficult charge, as, in conjunction with Wolſey, he was to pronounce ſentence concerning the king's divorce from his queen Catherine. When Henry could not be prevailed upon to renounce his project, Campeggi tried to perſuade Catherine to conſent to a voluntary ſeparation, that he might thus ſave the honour and authority of the church; but his endeavours were unavailing. In the following year he was recalled to Rome, and commiſſioned to attend as legate at the diet of Augſburg. He died at Rome in 1539; having, as a man of learning, enjoyed the eſteem of Eraſmus and of other eminent ſcholars, and having approved himſelf a faithful ſervant of the church, in times and circumſtances peculiarly critical and embarraſſing. His conſtitution for the reform of the German clergy, and his letters, throwing light on the hiſtory of his time, of which the principal are found in a collection of letters written to Frederic Nauſea, and printed at Baſil in 1550, are the only literary remains of him that are extant.

His brother, *Thomas Campeggi*, who ſucceeded him in the biſhopric of Feltre, was a learned canoniſt, publiſhed ſeveral works relating to the canon law, and died in 1564. Moreri. Tiraboſchi.

CAMPEL TREVE, in *Geography*, a town of France, in the department of the Ille and Villaine, and diſtrict of Redon; 5¼ leagues S.W. of Rennes.

CAMPELLO. See CALLAO.

CAMPEN, a tolerably large and handſome town of the United Provinces, ſeated on the weſt ſide of the river Yſſel, near its mouth, built in 1286, and fortified after the old manner. The moſt remarkable public buildings are the town houſe, and the churches of St. Nicholas and Notre Dame. It was formerly a place of conſiderable trade; but the port is now choked up by ſand; diſtant 15 leagues N.E. from Amſterdam, and 13 N. from Arnheim. N. lat. 52° 38′. E. long. 5° 35′.

CAMPENEAC, a town of France, in the department of Morbihan, and diſtrict of Ploermel; 1½ league from Ploermel.

CAMPER, PETER, in *Biography*, an ingenious and ſkilful anatomiſt, phyſician, and ſurgeon, born at Leyden in 1722, was early placed by his father under the De Moores to learn the art of deſigning and painting, in which he made ſufficient progreſs to enable him to make drawings of ſuch anatomical preparations as he choſe afterwards to have engraved. Quitting the pencil, he entered ſtudent at Leyden, under Boerhaave and the other profeſſors in that univerſity, but applied in a more particular manner to anatomy, which was his favourite ſtudy. In 1746 he took the degree of doctor in philoſophy and medicine, but continued his reſidence in Leyden until the year 1748, when he came to London, to attend the hoſpitals and anatomical lectures in this city; and having diligently employed twelve months in improving himſelf, and in forming connections with the principal anatomiſts here, he went to Paris. During the tour which he made in England, France, and Switzerland, in 1749, he was appointed profeſſor of philoſophy, medicine, and ſurgery at Franeker; and, in 1755, he was tranſlated to the chair of ſurgery and anatomy at the Athenæum of Amſterdam, where he was, in three years afterwards, alſo appointed profeſſor of medicine. Not finding that he enjoyed the quiet at Amſterdam which was ſuited to his habits of life, he quitted it in 1761, but retained the title of honorary profeſſor in that capital. He paſſed two years at his country-houſe in Frieſland, and was then nominated profeſſor of medicine, ſurgery, anatomy, and botany at Groningen. There he lived till June 1773, when he ſettled at Franeker, in order to ſuperintend the education of his ſons. From this period to that of his death, at the Hague in April 1789, he was occupied in the proſecution of his favourite ſtudies, in viſiting various parts of Europe, and in the performance of many public duties, to which he was called by the wiſhes of his countrymen. In 1762 he had been appointed a repreſentative in the aſſembly of the province of Frieſland; but, in 1787, he was nominated one of the council of ſtate, and was therefore obliged to reſide at the Hague. His death, at the age of 67, was occaſioned by a pleuriſy. Though he taught and cultivated every part of ſurgery, yet his attention ſeems to have been more particularly paid to the practice of midwifery, in which he had been inſtructed by profeſſor Trioen, who ſhewed him the uſe of the lever of Roenhuyſen. Of this inſtrument he gave an hiſtorical account to the Royal Academy of Surgery at Paris, which is publiſhed in the fifth volume of their Memoirs, and which procured him the honour of being made one of their foreign aſſociate members in the year 1774. He had before been made honorary member of the Royal Society in London; and was afterwards, in ſucceſſion, appointed fellow of of the Royal Society, and of the College of Phyſicians at Edinburgh, and of the Imperial Academy at Peterſburgh, and of the Royal Academy of Sciences at Paris, to each of which ſocieties he had ſent communications. He appears to have meditated a work of conſiderable magnitude and importance, of which, however, only two parts were publiſhed; viz. “Demonſtrationum Anatomico-Pathologicarum Liber primus, continens brachii humani fabricam et morbos, in folio maximo, cum quatuor figuris,” Amſtel. 1760; and “Liber ſecundus, continens pelvis humanæ fabricam et morbos,” 1762. The plates, which are commended for their accuracy, are from drawings made by the author. A ſmall time before his death he publiſhed in a Dutch journal at Amſterdam “An Account of a Method of performing the Operation of Lithotomy at two different times, by Peter Camper, M.D. &c.” The proceſs was communicated to him, he ſays, by M. Louis, who aſſured the author that ſince he adopted it, he had not loſt a ſingle patient by lithotomy. The operation is performed at twice, that is, on the firſt day the ſurgeon makes the inciſion into the bladder, the patient is then to be put to bed, and the extraction of the ſtone deferred until the ſecond, third, or fourth day. By this delay, the ſtone was at length taken away with greater facility, and with leſs pain to the patient, than when the whole of the buſineſs was completed at once. The method is not, however, new; it had been recommended by Peter Franco, who lived more than two centuries ago, and it has long ſince been laid aſide again, as attended with much greater inconveniences than the advantage expected compenſated. A tranſlation of this paper is publiſhed in the tenth volume of the London Medical Journal for the year 1789.

In 1789 his ſon, M. Adrian Gilles Camper, publiſhed at the Hague, in Latin, “A Diſſertation on the fracture of the Patella and Olecranon,” by his father, 4to. The object of this diſſertation is to inquire into the various circumſtances attending the accidents which are diſtinguiſhed by the general name of fractured patellæ. It is enriched with a large number of caſes, and with quotations from, and references to, the moſt celebrated authors on the ſubject; and it is accompanied with two plates, which do not reflect much honour on the artiſt. The laſt deſcribes the perfect cure of a fractured patella, though the upper and lower parts of the bone remained four inches diſtant from each other. In 1791 his ſon publiſhed at Utrecht in 4to. another work entitled “Verhandeling van Petrus Camper over het natuurlyk Verſhilder Wezenſtrekkan, &c.” i. e. Treatiſe of the late Peter Camper on the natural difference of features in perſons of various countries and ages; and on beauty, as exhibited in ancient ſculpture and engravings. Followed by the deſcription of a method of delineating various ſorts of heads with accuracy. The profeſſed object of this publication is to prove that the principal rules, laid down by the moſt celebrated painters and limners, are very defective; that they enable the ſtudent neither to delineate national characteriſtics in the countenance, nor to imitate the beauties of ancient ſculptors and artiſts. He contends that the obſervations of the abbé Winckelman, concerning *ideal* beauty, are not well founded; and he profeſſes to have diſcovered, in what that ſpecies of beauty really conſiſts. It is in conſequence of the imperfection of rules, he obſerves, that men of eminence have been ſo defective in their portraits of national characters; thus, in the paintings of De Wit, the chief ſignature of a Jew is a long beard; and Guido Reni, C. Marat, Rubens, and others have given no other characteriſtic of Moors than a black complexion. He denies the propriety of making either the oval, as is the moſt common method, or the triangle, as ſome artiſts have propoſed, the foundation of portraits to be taken in profile: and he propoſes more certain principles in their place. Neither the author's principles nor his mode of illuſtrating them, can be well underſtood without the plates that accompany this work. The general doctrine, however, is, that the difference in form and caſt of countenance proceeds from the relation which the cranium is found to bear to the direction of an horizontal and a perpendicular line. Let us ſuppoſe a frame of wood, ſimilar to that of a picture, to be made perfectly ſquare; and that the upper part be graduated into 90 degrees, proceeding from the right to the left. Let the cranium or head be placed in the centre of this frame. Draw an imaginary line from the lower part of the upper lip to the forehead, which the profeſſor terms the *linea facialis*, and obſerve in what degree it interſects the upper part of the frame; and this will give one characteriſtic, and the ſituation of the maxillæ, reſpecting the perpendicular ſide of the frame, another. E. G. the *linea facialis* of the orang will interſect the horizontal line at 58; that of the Negroe at 70; that of the European, at 80 or 90; while, in the Grecian antique, the facial line will project ten degrees beyond the limits of the frame, forming an angle in a different direction. In the ape, the negroe, and the calmuk, the maxillæ project in various proportions beyond a perpendicular line drawn from the lower part of the forehead to the chin; in the European, the maxillæ are on a line with the perpendicular; and in the antique, they recede within it. According to this poſition of the *linea facialis*, are every other part of the head, the poſition of the eyes, of the mouth, ears, &c. regulated. This Camper proves by various examples.

In 1792 the profeſſor's ſon publiſhed at Utrecht, in 4to. a ſequel to the preceding treatiſe, entitled, “Reden voeringen van wylen Petrus Camper, &c.” i. e. Lectures of the late Peter Camper on the manner of delineating the different emotions of the mind in the countenance;—on the ſtriking reſemblance between quadrupeds, fowls, fiſhes, and the human ſpecies;—and on the conſtituent beauty of form. Illuſtrated by plates. The firſt lecture treats of the manner of repreſenting the different emotions of the mind. For this purpoſe the firſt object, he ſays, is to become well acquainted with the form of the cranium;—the ſecond, with the principal muſcles of the face;—and the third, with the nerves which ſet theſe muſcles in motion. E. G. a perſon under the influence of ſorrow and melancholy, ſuffers his head to ſink, as it were, under the weight of the oppreſſion, or he ſupports it with his hand. The muſcles of the neck no longer maintain the equipoiſe; that is, the nerves belonging to the neck are rendered inert by the influence of this paſſion. On the contrary, a perſon under the influence of mirth and of violent laughter, elevates his head; his breaſt is agitated; he holds his ſides with both hands; his legs begin to fail him, and he would roll on the ground, if the fit continued. A man in a rage, beats with his hands, ſtamps with his feet, and his face is violently convulſed. Reſpect impedes ſpeech; an inward trembling takes away the power of motion, the heart beats, and the livelieſt eyes look downward; if ſhame accompanies the emotion, the blood paints the face, neck, and breaſt with crimſon. Thus, in all emotions, particular nerves are affected; and, conſequently, it is the buſineſs of every painter to make himſelf acquainted with theſe, &c. Conformably to this plan, the profeſſor having firſt given to his audience a general idea of the form of the cranium, of the principal muſcles of the face, and traced the courſe of the nerves, proceeded to point out, by various drafts or ſketches, the changes produced in the countenance in the emotions of ſurpriſe, contempt, complacency, laughter, ſorrow, weeping, wrath, and in death. The ſecond lecture treats of the ſimilarity which exiſts between quadrupeds. The profeſſor maintains that in all the larger animals, inhabiting the three elements, there is one part of the body common to all, and very ſimilar in its form; that the great diverſities obſervable in the animal creation, from man down to the finny tribe, proceed from the diverſity which takes place in the appendages to this central part; and that theſe diverſities are according to the nature of the animal, to the element which it is deſtined to inhabit, to the kind of food by which it is nouriſhed, and to the particular manner of obtaining this food. The permanent part is the trunk; that is, the vertebræ of the back and loins, with the ribs. He then illuſtrates this general idea in the horſe, camel, elephant, greyhound, &c. and then deduces the following ſelf-evident concluſion, that the more perfectly an artiſt is acquainted with the nature of animals, and the deſigns of their formation, the better he will ſucceed in delineating them. In the ſequel of this lecture, various rules are laid down, and examples given, by which artiſts may be enabled accurately to delineate the horſe, cow, dog, camel, &c.; or, with a few ſtrokes of the pencil, to convert the one into the other, merely by an attention to theſe rules, and to the deviations which take place in conſequence of the particular nature of the quadruped. In the third lecture the idea is extended to birds and fiſh.

In the year 1803, a collection of Camper's works was publiſhed at Paris, in 3 vols. 8vo. and a folio atlas of plates, under the title of "Oeuvres de Pierre Camper, qui ont pour Objet l'Hiſtoire Naturelle, Phyſiologie, et l'Anatomie Comparé, &c." i. e. The works of Peter Camper, which treat of natural hiſtory, phyſiology, and comparative anatomy. To theſe volumes a general account of his life, by his ſon, is prefixed, of which we have availed ourſelves in the compilation of this article. The firſt volume comprehends a diſſertation on the orang outang, and ſome others of the monkey tribe, a memoir on the double-horned rhinoceros, another on the rein deer, and conjectures relative to ſome petrified bones found in the mountain of St. Pierre, near Maeſtricht, which profeſſor Camper conſiders as the bones of fiſh. In his account of the orang outang, the profeſſor remarks, that immediately below the ſkin and platyſma myoides, two bags made their appearance on each ſide of the windpipe, the right extending over the clavicle, the left being much leſs. Theſe bags were empty, and each of them communicated with the cavity of the larynx, by means of an opening paſſing between the thyroid cartilage and the os hyoides, and terminating at the ſide of the epiglottis. Some ſpecies of monkies had one bag of a ſimilar kind, but the poſſeſſion of two the profeſſor conſiders as peculiar to the orang outang. This organization ſeems to have been known to Galen; but its uſes are unknown, except that theſe cavities can be filled with air, and compreſſed, at the pleaſure of the animal. The profeſſor obſerved a conformation in the throat of the rein-deer, reſembling that noticed above, with regard to ſome kinds of monkies. The ſecond volume is chiefly occupied with an intereſting account of the elephant; and this article is followed by two eſſays, one on the phyſical reaſons which render man ſubject to more diſeaſes than other animals, and on the means of eſtabliſhing health, which can be derived from comparative anatomy; the other on the origin and the colour of the negroes. Their origin is aſcribed to our firſt parents, and their colour to the long continued effects of the climate in which they lived, the food by which they were nouriſhed, and the diſeaſes to which they were ſubject. The third volume contains lectures on an epidemic diſeaſe of horned cattle; a diſſertation on the phyſical education of children; lectures read to the Academy of Painting; an account of the generation of the pipa, or American toad; obſervations on the croaking of male frogs; and an account of the ſtructure of the bones in birds. In his lectures delivered to the Academy of Painting, the author diſcuſſes the ſubject of phyſical beauty, and his general concluſions are the following: viz. That no philoſopher, or artiſt, has ever proved or taught what properly conſtitutes phyſical beauty;—that we have no innate idea of this, as we have of moral beauty; and that it is only by means of ſtudy that we arrive at the knowledge of what is beautiful in the imitative arts;—that phyſical beauty, whether in man and other animals, or in architecture, does not conſiſt in a certain proportion or ſymmetry of parts;—that in giving different forms to men and animals, nature has not aimed at endowing them with a certain degree of beauty, but only at beſtowing upon them what is uſeful in their particular ſphere;—that all which relates to phyſical beauty is founded only on tacit conſent, habit, and authority;—and that the true and only beauty which exiſts, and ſuch as the greateſt maſters have introduced into architecture, painting, and ſculpture, can be referred to nothing more than the care which they have taken that their works ſhould imitate nature as faithfully as poſſible: while they, at the ſame time, avoid the faults which neceſſarily reſult from the imperfection of viſion, and the refraction of light. No particular form, ſays this author, can, abſtractedly conſidered, conſtitute beauty; the real baſis of beauty, according to his reaſoning, conſiſts in the means being adapted to the end; and, excluſively of this, our ideas are influenced by cuſtoms, national prejudices, and implicit confidence in the taſte and opinions of others. This is a ſubject which has been treated with metaphyſical acumen by Burke, Smith, Aliſon, and Sayer. See Beauty.

The eſſay on the ſtructure of the bones of birds, which terminates this work, contains an account of the ſame peculiar conformation which was deſcribed by Mr. John Hunter in the Philoſophical Tranſactions for 1774; but it appears that this curious ſtructure was diſcovered by profeſſor Camper three years before Mr. Hunter's publication of it, and that it was ſoon afterwards made known to many ſcientific men on the continent. The account of the profeſſor's diſcovery was mentioned in a diſſertation read by M. Charnack, at a public meeting of the univerſity of Groningen, Auguſt 25, 1773, but Mr. Hunter's paper was not read to the Royal Society till the February following. See Bird. The atlas accompanying theſe volumes contains a number of well executed plates.

CAMPESTRE, in *Antiquity*, a ſort of cover for the privities, worn by the Roman ſoldiers in their field exerciſes; being girt under the navel, and hanging down to the knees. The name is ſuppoſed to be formed from *campus*, the field or place where the Roman ſoldiers performed their exerciſes.

CAMPESTRIS, in *Entomology*, a ſpecies of Cimex, commonly found in meadows. The colour is yellowiſh, with a ferruginous ſpot on the wing-caſes. Fabricius.

Campestris, a ſpecies of Cicindela, common in moſt countries of Europe. It is of a green colour, with five white dots on the wing-caſes. Linn. &c. Inhabits ſandy fields chiefly. Donov. Brit. Inſ. &c.

Campestris, in *Ornithology*, a ſpecies of Alauda, about ſeven inches long, that inhabits Europe. The tail-feathers are brown, with the lower half, except of the two middle ones, white: chin and breaſt yellowiſh. Linn.

This is called by Briſſon Alauda Campeſtris, and by Ray and Willughby, Alauda minor Campeſtris, Spipolette by Buffon, Brachlerche by Friſch, and *meadow-lark* by Latham.

CAMPHIRE, or Camphor-tree, in *Botany*. See Laurus *camphora*.

CAMPHOR is a white tranſlucent vegetable product, ſomewhat unctuous to the touch, and tenacious between the teeth; it may be crumbled between the fingers without difficulty; it has a peculiar fragrant odour, not unlike that of roſemary, which diffuſes itſelf to a conſiderable diſtance: its flavour is aromatic and bitter, giving at firſt the ſenſation of heat, but afterwards of remarkable cold. Its ſpecific gravity is 0.996, ſo that it juſt floats on the ſurface of water: when expoſed to a moiſt and warm air, it readily volatilizes: by the contact of flame it immediately takes fire, burning with a large white flame, and much ſmoke; if pure it is wholly conſumed, without leaving any reſidue. When heated in a ſpoon, it diſſolves into an oleaginous liquid.

There are two ſpecies of trees from which the camphor of commerce is procured. That with which Europeans are the beſt acquainted, is the laurus camphora, a large foreſt tree, that grows wild in the iſlands of Borneo and Sumatra. Of this tree, the leaves, the fruit, and every other part, when bruiſed, give out a ſtrong odour of camphor, and the wood is much ſought after as a material for cheſts, &c. becauſe its peculiarly aromatic ſmell renders it impenetrable to ants and other deſtructive inſects. The oldeſt trees in general contain the largeſt proportion of camphor, and it is reckoned a good ſign if the natural crevices in the principal branches have for ſome time paſt yielded ſpontaneouſly a quantity of oil of camphor. The camphor itſelf is found in perpendicular veins near the centre of the tree, or concreted in the knots of the wood. The larger pieces are picked out with a ſharp inſtrument, and the ſmaller ones are procured by means of raſps, to which the camphor adheres, mixed with ſmall bits of wood and other impurities. The ſame tree yields alſo the oil of camphor, which appears to be a very fluid kind of reſin, ſtrongly ſmelling of camphor, and from which a conſiderable portion of this latter ſubſtance may be extracted by diſtillation. This oil exudes ſpontaneouſly from the older trees, but is chiefly procured by inciſion, in the following way: a cavity capable of containing about a quart is cut in the trunk, into which a lighted reed is introduced for about ten minutes, this draws the juices towards the cavity; which, in the ſpace of a night, is compleatly filled with oil; the ſame copious flow of juice continues for three nights longer, after which, by a freſh application of heat, a further but leſs plentiful ſupply is obtained.

In Japan are large foreſts of another ſpecies of laurus, which yields camphor, though not in ſuch abundance as that which we have already deſcribed. In this tree the camphor is not contained in concrete maſſes, ſo that in order to procure it diſtillation muſt be had recourſe to. For this purpoſe, the roots and extremities of the branches, being cut into thin chips, are put into a net or upon a wooden framework, and ſuſpended within a kind of alembic, at the bottom of which is a little water: by the application of a boiling heat, the ſteam penetrates the contents of the net, and carries the camphor along with it into the capital, where it is depoſited like ſnow on the rice ſtraw with which the capital is lined.

The Sumatran camphor is much more eſteemed in the Eaſt than the Japaneſe, from which it may readily be diſtinguiſhed by its ſuperior adheſiveneſs, in conſequence of which, it is much leſs volatile than that which has been procured by diſtillation. All the camphor which comes to Europe is the produce of Borneo or Sumatra, and arrives in the form of irregular lumps of a yellowiſh grey colour, which are ſpungy and very light, and when broken diſcover a cryſtalline granular fracture.

The purification of crude camphor is an art that is carefully kept ſecret by thoſe who are in poſſeſſion of it. Venice had formerly the monopoly of this manufacture, afterwards it was ſucceſsfully practiſed in Holland, and at preſent large quantities are refined by ſome of the Engliſh druggiſts. The proceſs is underſtood to be very ſimple, and probably conſiſts merely in mixing the crude camphor with chalk or lime, and ſubliming it in as high a heat as can be ſafely applied. Spirit of wine has been propoſed and employed on a ſmall ſcale for the purification of camphor, but is ineligible, both on account of its expenſiveneſs and its being incapable of ſeparating any reſin with which the camphor may be deſignedly or accidentally mingled. Simple ſublimed camphor differs from the refined camphor of the ſhops in being of a looſe ſpungy granular conſiſtence like ſnow, but it may eaſily be made to aſſume the cloſe and foliated texture of the latter, by ſimple fuſion in cloſed veſſels.

Although the camphor of commerce is obtained only from the laurus camphora and a kindred ſpecies in Japan, yet its exiſtence has been proved in many other ſpecies of lauri. Thus the roots of the cinnamon tree *(laurus cinnamomum)*, of the caſſia, *(laurus caſſia)*, of the ſaſſafras *(laurus ſaſſafras)*, may be made to yield real camphor by diſtillation, though not in ſufficient quantity to balance the expence. The diſtilled water of fennel ſeeds has been found to depoſit cryſtals of camphor by long ſtanding. It has alſo been diſcovered in the freſh roots of galangal, zedoary, and ginger, and in the ſeeds of cardamom and long pepper. It is probably contained in all the eſſential oils, and has actually been procured from thoſe of juniper, ſage, hyſſop, thyme, peppermint, roſemary, and lavender. The depoſition of cryſtalline grains ſimilar to camphor in old eſſential oils had been obſerved by many of the older chemiſts, but no important inveſtigations took place in conſequence of this diſcovery, till Prouſt took the ſubject in hand, and ſhewed, from accurate and large experiments, that camphor may be profitably prepared from the eſſential oils produced in the ſouthern countries of Europe.

This able chemiſt having accidentally obſerved that the eſſential oil of lavender, diſtilled in the province of Murcia in Spain, depoſited a large proportion of camphor, and that the other eſſential oils of this diſtrict were remarkably fragrant, ſelected the eſſential oils of roſemary, marjoram, ſage, and lavender, as the ſubjects of the following experiments. Equal portions of the four oils were placed in ſhallow earthenware veſſels, and expoſed to ſpontaneous evaporation at a temperature not exceeding 57° Fah. and in proportion as the cryſtals of camphor were depoſited, they were taken out and drained, and kept in well-ſtopped vials. By this ſimple proceſs the oil

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| of roſemary yielded | 6.25 | *per cent.* of camphor. |
| — marjoram | 10.14 | ———— |
| — ſage - | 21.06 | ———— |
| — lavender - | 25 | ———— |

The oil of lavender appears to be fully ſaturated with camphor, for although when heated it will take up about $\frac{1}{16}$ of its weight more of this ſubſtance, yet it depoſits by cooling a greater quantity even than it was made to diſſolve. When expoſed to ſpontaneous evaporation the filaments of camphor begin to appear in about twelve hours, and continue to be depoſited till almoſt all the oil is evaporated. In the other oils the cryſtals are later in ſhooting, according to their relative proportions of camphor, and when about four-fifths of the oil are evaporated, the reſidue becomes thick, and ceaſes to depoſit any more cryſtals. The camphor produced by each of theſe four experiments, being dried by ſlight preſſure between filtering paper, was in dry almoſt pulverulent cryſtals as brilliant and almoſt as white as ſnow, and ſo little of the peculiar odour of the oil remained, that it was by no means eaſy to aſcertain, from the ſmell alone, from what ſpecies of oil any particular parcel of cryſtals was obtained.

The proportion of camphor procurable from theſe oils depends,

pends, in ſome degree, on the rate at which the evaporation proceeds, the quantity being in an inverſe ratio to the temperature. If oil of lavender is diſtilled from a water-bath in an alembic, at a temperature inferior to boiling water, till one-third is come over, the remaining two-thirds will depoſit flakes of camphor while cooling; theſe being removed, and the diſtillation repeated, a freſh depoſition will take place in the reſidue; and a third diſtillation will yield all the remaining camphor except about $\frac{1}{2}$ *per cent.* This, however, being a much more rapid proceſs than ſpontaneous evaporation, the total produce of camphor from the three diſtillations does not amount to more than 20 *per cent.*, the reſt being held in ſolution by the oil in the receiver. If the *balneum mariæ* is made to boil, the produce of camphor will be conſiderably diminiſhed, and part will ſublime into the capital of the alembic. The camphor from oil of lavender, by either of theſe methods, is not abſolutely pure, for when ſublimed at a gentle temperature, it leaves behind a ſmall portion of browniſh reſin ſtill mixed with camphor. The moſt economical way of refining this camphor is to mix it with half its weight of chalk or lime, or waſhed wood-aſhes, and ſublime it, by which operation it loſes about $\frac{1}{24}$ of its weight. The produce of refined camphor, therefore, by ſpontaneous evaporation of the oil of lavender, amounts to about 24 *per cent.*, and, by diſtillation, is equal to 19 *per cent.*; this latter method is, however, by far the moſt economical, notwithſtanding the additional expence of fuel and apparatus, as it ſaves both time and the oil, which would otherwiſe be entirely loſt.

The production of camphor by the action of muriatic acid on oil of turpentine, is a diſcovery of very late date: it was firſt effected, accidentally, by M. Kind, in preparing the arthritic liquor of Pott; the experiment was then repeated by Trommſdorff with the ſame reſult; and, laſtly, the ſociety of pharmacy at Paris being informed of theſe facts, nominated three of their members to repeat the inveſtigation, and make a report on the ſubject; from which ſources the following facts are derived.

A ſmall quantity of camphor may be obtained from oil of turpentine by ſimple diſtillation, provided the proceſs is carried on ſufficiently ſlowly. Eight ounces of this fluid were diſtilled in a glaſs alembic, at the temperature of about 124° Fah.; four ounces of very highly rectified eſſential oil paſſed into the recipient, and the capital was found lined with ſmall cryſtals of real camphor.

This ſubſtance, however, is procured in much larger proportions by the aſſiſtance of muriatic acid. Four pounds of oil of turpentine were put into a Woulfe's apparatus, and the retort being charged with an equal weight of decrepitated common ſalt, and half as much ſulphuric acid, the whole of the muriatic acid gas that could be obtained by a moderate heat from theſe materials, was tranſmitted into the oil of turpentine, and wholly abſorbed by it. In conſequence of this, the oil became exceedingly hot, and acquired firſt a light lemon-colour, and towards the end of the proceſs, a clear tranſparent brown, a ſmall quantity of a thick oily fluid being gradually diſengaged and ſinking to the bottom. The liquor being allowed to cool for twenty-four hours, was found converted into a thick cryſtalline maſs, from which, when laid on a ſloping ſurface, the brown liquor drained away. Being then wrapped in filtering paper, and ſubjected to moderate preſſure, twenty-four ounces of a perfectly white cryſtalline matter were left behind of a peculiar odour, in ſome degree participating both of oil of turpentine and muriatic acid. The liquor which had drained from the cryſtals was put into a cool cellar, and, in the ſpace of a few days, was found to have depoſited four ounces more of cryſtals, and two ounces additional were obtained by expoſing it to a powerful freezing mixture. Thus four pounds of oil of turpentine yielded thirty ounces of cryſtals, or not far ſhort of half its weight.

The cryſtals thus obtained acquired a dazzling white colour ſimply by waſhing them with water, but ſtill retained a terebinthinate odour; and the waſhings were acidulous to the taſte, having taken up a little muriatic acid, but were alſo highly aromatic. Another portion of cryſtals being waſhed with a weak ſolution of pearlaſh, was found to reſemble common camphor in its odour, that of turpentine having nearly diſappeared. It was thought that ſublimation would be more effectual than waſhing, in purifying this camphor; accordingly, two portions of it were mixed, the one with an equal weight of charcoal, and the other of quicklime, and were heated in glaſs alembics: the capitals ſoon became covered with radiating cryſtals of a brilliant white colour, entirely free from the terebinthinate odour, and reſembling that of camphor, only not quite ſo powerful. In this ſtate it floats on the ſurface of water, and communicates to it a camphoric flavour, is very inflammable, ſoluble in alcohol, and precipitable from it by the action of water. Nitric acid acts upon it in the ſame manner as on Eaſt Indian camphor, but more ſlowly; but it appears to be wholly inſoluble in acetic acid.

The preſence of camphor having been ſhewn in ſuch a variety of ſubſtances, in all of which, when brought to the higheſt degree of purity, it appears to be abſolutely the ſame, that it may be conſidered as one of the ſecondary vegetable principles; hence an inquiry into its chemical properties and compoſition becomes of conſiderable intereſt.

Camphor, on account of its volatility, requires to be kept in well cloſed veſſels; it is not, however, by any means ſo eaſily evaporable as is generally ſuppoſed. According to Kunſemuller, pulverized camphor ſpread thin and expoſed to the air at a temperature not exceeding 52° Fah. does not loſe more than half its weight in 16 weeks; the ratio of volatilization, however, rapidly increaſes with an increaſe of temperature. The moiſture of the air alſo has a conſiderable effect, the loſs of camphor being much greater in a humid atmoſphere than in a dry one. The degree at which camphor melts is fixed by Venturi at 302 Fah. and by dividing a maſs that has been ſlowly cooled in the direction of its laminæ, it appears to cryſtallize in octohedrons.

Water has little or no action on camphor; at a boiling heat it takes up, however, enough to acquire both the odour and flavour of this ſubſtance. By the aſſiſtance of gum-mucilage or ſugar it forms with water a whitiſh emulſion.

Alcohol at the uſual temperature will take up between a ſeventh and an eighth of its weight of camphor, and when boiling it will diſſolve half its weight, the greater part of which is again depoſited by cooling. If equal parts of camphorized alcohol and ſulphuric acid are diſtilled together, the produce is a camphorized ether, and a tenacious black reſinous maſs remains in the retort. Camphor is alſo copiouſly ſoluble in ſulphuric, and probably in all the other ethers. When camphorized alcohol or ether is mixed with water, nearly the whole of the camphor ſeparates in thick curdy flakes, which, when dried, exhibit the camphor unaltered in any of its properties. Oils, both the expreſſed, the eſſential, and the empyreumatic, combine with camphor, as alſo do the reſins and balſams. The hardeſt and dryeſt reſins are converted by it into a ſoft tenacious maſs, remarkably ſoluble in alcohol. The alkalies, whether in their cauſtic or carbonated ſtate, have no action whatever on camphor, nor will they unite even when aſſiſted with oil or ſoap.

Sulphur and camphor will combine together by means of very gentle fuſion; the reſulting maſs is brittle when cold, but ſoft and tenacious when warm. The alkaline ſulphurets will alſo unite by fuſion with camphor, and retain it when diſſolved in water; the addition of an acid to this ſolution throws down the ſulphur and camphor in a ſtate of intimate combination with each other.

When ſet fire to in atmoſpheric air or oxygen gas, camphor burns with a copious white flame and black ſmoak, and is entirely conſumed. A large quantity of carbonic acid and carburetted hydrogen is produced. The ultimate conſtituent parts of camphor appear to be carbon, hydrogen, and oxygen, but in what proportions is not yet aſcertained.

Camphor when diſtilled *per ſe* riſes unaltered; but if mixed with bole in the proportion of four parts of the latter to one of the former, and ſubjected to dry diſtillation, it is converted to a butyraceous conſiſtence; and by a ſecond diſtillation with an equal quantity of freſh bole is entirely reſolved into a fluid colourleſs oil, and a ſmall portion of watery acidulous liquor, ſmelling ſtrong of camphor; the bole at the ſame is reduced to a black ſparkling powder being almoſt entirely deoxygenated. Clay, according to La Grange, produces the ſame effect. This oil of camphor, according to Koſegarten, is nearly colourleſs, has a peculiar odour like that of thyme and roſemary, and bears a cloſe analogy to the eſſential oils. It is ſoluble in alcohol and ſeparable unaltered from its ſolution by agitation with water. It forms ſavonules with the alkalies, and is eaſily volatilizable for the moſt part by a gentle heat. Nitric acid produces no other effect than tinging it of a reddiſh colour, and even a mixture of this acid with the concentrated ſulphuric only deepens the colour of the oil ſtill more, and brings it to a ſomewhat thicker conſiſtence.

Both vinegar and carbonic acid will diſſolve a ſmall proportion of camphor. The muriatic and fluoric acids when in a ſtate of gas take up a conſiderable quantity, but depoſit nearly the whole by the contact of water. Concentrated ſulphuric acid diſſolves camphor largely even in the cold, but by the aſſiſtance of a moderate heat it takes up ſo much as to form a thick homogeneous maſs, of a brown or black colour, and a ſulphureous odour, which when warm is fluid, but coagulates by a moderate heat, and by evaporation is brought to a reſinous conſiſtence. This is ſoluble in alcohol, but is decompoſed by water, the camphor being diſengaged with little or no alteration, and the mixture now no longer exhaling a ſulphureous but a camphoric odour. The action of oxymuriatic acid on camphorized ſulphuric acid is remarkable: if one part of camphor is diſſolved in eight parts of ſulphuric acid, and this mixture is poured in a retort upon four parts of black oxyd of mangeneſe and as much water, the reſult of a ſlow diſtillation of theſe materials will be acetous acid mixed with a ſmall portion of undecompoſed camphor.

Nitric acid, when ſomewhat concentrated, diſſolves camphor in conſiderable quantities at the uſual temperature. The ſolution is of a very dilute yellow colour, and ſeparates by ſtanding into two diſtinct liquids. The lower conſiſts of a mixture of nitric and camphoric acids, the upper fluid is of the conſiſtence of oil, and is called *acid oil of camphor*: it is a combination of camphoric and nitric acid. This oil is ſoluble in alcohol, but is decompoſable with precipitation of the camphor by water or alkalies. The converſion of camphor into a peculiar acid was firſt obſerved by Koſegarten, and was afterwards more fully elucidated by La Grange.

The proceſs of Koſegarten is the following: Put one part of camphor into a retort, with 12 parts of ſtrong nitric acid, and diſtil it ſlowly to dryneſs: a large quantity of carbonic acid and nitrous gas is diſengaged, and the acid in the receiver is covered with a thin ſtratum of acid oil of camphor; a ſmall portion of camphor ſublimes into the upper part of the retort, and the maſs at the bottom of the veſſel is camphor approaching to the ſtate of a vegetable oxyd. It has no longer the peculiar odour of the original ſubſtance, and when laid on a hot coal it evaporates with ſomewhat of a reſinous odour, but without undergoing combuſtion: it is ſoluble in alcohol but not in water. This oxygenated camphor by being twice diſtilled to dryneſs, with ten parts of nitric acid at each proceſs, is converted to a white pulverulent ſalt, ſoluble in hot water, and which has obtained the name of *camphoric acid.*

The method of La Grange differs chiefly in requiring a ſmaller quantity of nitric acid. He takes one part of camphor and four of nitric acid, and diſtils the mixture by a very gentle heat; the acid that paſſes into the receiver being mixed with four parts more of freſh acid, is returned upon the matter in the retort and again diſtilled. This is repeated five ſeveral times with twenty parts of nitric acid in the whole, and the operation is known to be finiſhed when the liquor in the retort cryſtallizes on cooling. The produce of camphoric acid by either of theſe methods does not much exceed one half of the camphor made uſe of.

Camphoric acid, when cryſtallized haſtily, appears as a maſs of white ſilvery filaments; but by ſlow cooling aſſumes the form of parallelipipedal or rhomboidal plates, which effloreſce on expoſure to the air. To the taſte it is ſlightly ſour and bitteriſh. It reddens ſyrup of violets, and tincture of litmus. It diſſolves eaſily in alcohol and in hot water, but requires 200 parts of this latter fluid at the ordinary temperature for its ſolution. When heated it gives out a thick aromatic ſmoak, and is entirely diſſipated; in cloſe veſſels it ſublimes unaltered, if the heat is not too great. The alcoholic ſolution of this ſalt is not decompoſed by water, a circumſtance that diſtinguiſhes it from benzoic acid, to which it bears a conſiderable reſemblance. It is ſoluble in the expreſſed and eſſential oils, and in the mineral acids, and forms a precipitate with the muriat and ſulphat of iron.

Camphoric acid unites with the ſalifiable baſes forming a genus of ſalts, the CAMPHORATS. Of theſe very little is known. The neutral and earthy camphorats, which are the only ones that have as yet been the ſubject of any experiments, are all decompoſable by heat, except the camphorat of ammonia, which ſublimes unaltered. When expoſed to the blow-pipe, the acid burns off with a blue flame. The camphorats are decompoſable with abſtraction of the baſe by the mineral acids, and with abſtraction of the acid by moſt of the metallic, barytic, and calcareous ſalts. The camphorats of lime, barytes, and magneſia, yield their acid to alcohol.

The uſe of camphor in the arts is to aſſiſt the ſolution of the reſins in various menſtrua. It is employed with ſucceſs in cabinets of Natural Hiſtory to prevent the approach of inſects which appear to be ſtupefied and killed by the pungency of its odour. For its medical properties and application ſee the next article.

CAMPHOR, *Medical uſes of, and pharmaceutical preparations.* Camphor has long been conſidered as an article of high importance in the materia medica, and is in daily uſe for a great variety of purpoſes, in which its beneficial operation is unqueſtionable. Yet it is chiefly as an auxiliary that it is reſorted to, and though a valuable medicine, it does not appear quite to deſerve the very high encomiums that have been given to it by many eminent writers.

In a moderate doſe, camphor when taken into the ſtomach, (mixed with ſome vehicle which will allow of its being divided and diſtributed over this organ) increaſes the real heat of the body, though its firſt effect is often a ſenſation of coldneſs. It ſoon produces a ſtrong tendency to perſpiration; but the pulſe is not ſenſibly affected in quickneſs by a doſe capable of producing copious ſweat, and an elevation of ſpirits like the beginning of intoxication. In a febrile irritable ſtate of body, accompanied with ſpaſmodic affections of the muſcles, camphor may be given with ſafety and advantage; and it acts very decidedly as an antiſpaſmodic, and very materially aſſiſts the action of opium. Experience ſhews that the action of camphor is ſudden and very tranſitory, reſembling in this reſpect that of the eſſential oils, only it muſt always be remembered that on account of the extreme ſolubility of this ſubſtance in moſt of the animal fluids, unleſs it be very minutely divided, it will remain long unaltered in the alimentary canal; and thus the ſame effect may in fact be produced by the length of time in which it remains in contact with the organs, as if its operation were highly permanent.

Experiments have been made both on the human body and on other animals with regard to the effects of camphor in exceſſive doſes, which ſhew it to be poſſeſſed of extremely active deleterious powers, and teach ſome caution in the uſe of this remedy. Camphor given internally to ſmall animals, ſuch as birds, cats, dogs, &c. produced ſevere effects in all. The firſt operation appeared to be that of an exceſſive acrid ſtimulus on the ſtomach, producing foaming at the mouth, violent convulſive twitchings over the body, ſometimes with vomitings; acceſſions of fury in dogs and cats; ſymptoms reſembling intoxication; and laſtly, comatoſe ſtupor and death. On opening the body, the ſtomach was found violently inflamed, and the inteſtines dilated with wind and froth. Twenty four grains proved a pretty certain poiſon to cats. The effects of an over doſe of this ſubſtance on the human body were accurately ſhewn by the experiments to this expreſs object, which Dr. Alexander made on himſelf. On taking one ſcruple the pulſe ſoon fell from 68 to 65: two ſcruples more gave a great and at firſt agreeable ſenſe of warmth in the ſtomach, but ſoon followed by exceſſive anxiety and creeping of the fleſh, nauſea, giddineſs, tremors, convulſions, loſs of recollection, and delirium, coma and quickened pulſe. On drinking warm water, much of the camphor came up from the ſtomach three hours after it had been taken, and with very ſpeedy relief, and the whole of the formidable train of ſymptoms brought on by this raſh experiment ſubſided readily and left no permanent inconvenience.

To inſects and very ſmall animals, the effluvium of camphor, even at a common temperature, is obviouſly exceſſively haraſſing, as they quickly avoid it; but if confined in a cloſe veſſel with a piece of camphor, it proves fatal to many ſpecies.

Camphor is a very powerful antiſeptic; and from this and its ſtimulant powers, all the medicinal virtues attributed to it have been uſually derived. Indeed, to the very great antiſeptic power which it poſſeſſes, may be attributed the ſomewhat exaggerated praiſe which it has received as an internal medicine in the cure of typhus, and (ſo called) *putrid* fevers, in the fever attending local gangrene, and ſimilar diſeaſes; for its efficacy in theſe is certainly not comparable to that of other medicines. In the typhoid diſeaſes attended with ſpaſmodic motions of the limbs (at all times a moſt formidable ſymptom) camphor is peculiarly ſerviceable, and much aſſiſts the action of opium. In rheumatic complaints or other diſorders where a copious ſweat is wanted, there are few medicines ſo certain as a mixture of camphor and nitre, about five grains of the former, and from 15 to 20 of the latter, taken at ſhort intervals.

A very common, and generally cordial and grateful drink, (beſides being a good vehicle for other medicines), is the *miſtura camphorata*, or *camphor julep*, made by rubbing one dram of camphor firſt with a little ſpirit of wine to bring it to a powder, then with half an ounce of ſugar, and adding a pint of boiling water. When cold, the water taſtes ſtrongly and pleaſantly of the camphor, though almoſt the whole ſwims at the top unmixed; and ſo little camphor is diſſolved that neither by evaporation nor by any other method can any viſible quantity be extracted from the water. A very elegant preparation of camphor, often of ſingular uſe in ſpaſmodic irritability of the ſtomach, and inceſſant vomiting, is a ſolution of camphor in water ſaturated with carbonic acid. If pulverized camphor is diffuſed in water in a Nooth's machine or any ſimilar contrivance, the water as it takes up carbonic acid diſſolves alſo a very ſmall portion of the camphor, though it is doubtful whether it takes up in this way more than in the common camphor julep.

Almond emulſion with camphor diſſolved in it is a much ſtronger ſolution of this ſubſtance than the former preparations, the almonds much aſſiſting the ſolution of the camphor. One ſcruple of camphor, (rubbed to powder, with a drop or two of alcohol), two drams of almonds, one dram of ſugar and half a pint of water, make the "emulſio camphorata." It is uſed for the ſame intention as the camphor mixture, and it is alſo much employed as a drink in ſtrangury, difficult micturition, the ardor urinæ of gonorrhœa, and other painful affections of the urinary organs. It is ſaid that magneſia much aſſiſts the ſolubility of the camphor in this emulſion, and is beſides often an uſeful addition as a medicine.

Camphor and opium are very frequently joined both in the liquid and ſolid form. The commoneſt liquid preparation of the two is the "tinctura opii camphorata," or "elixir paregoricum," a medicine of undoubted utility in coughs, oppreſſion of breathing, and many other complaints; and perhaps of all others the commoneſt, (and we may add, one of the ſafeſt and the beſt) of the domeſtic medicines. Camphor is thought peculiarly to counteract the heating and unpleaſant effects of opium, and, together, to determine gently to the ſkin, and to allay ſpaſmodic irritation. They may be well combined in the form of pills, but to divide the camphor and increaſe its ſolubility, it ſhould be rubbed down with a drop or two of alcohol, or ſpirit of ammonia. A bolus is, perhaps, a better form, and the ſolubility of camphor in the ſtomach is further increaſed by being triturated with gum arabic.

Camphor is largely employed as an external application, ſometimes as a ſtimulant and antiſeptic conjoined, as where it enters into the compoſition of the fomentations of aromatic herbs uſed in gangrene or ſphacelus; ſometimes as a ſtimulant and ſuppoſed diſcutient to indolent tumors, rigidity of tendons, and the like; ſometimes as a ſimple ſtimulant, as for example, when uſed as a collyrium to chronic complaints of the eyes, &c.

Camphor for external uſe is diſſolved either in oily or in ſpirituous menſtrua. Olive oil diſſolves it largely, eſpecially when pulverized and aſſiſted by a gentle heat. The ſolution is quite limpid, and often greeniſh. It is a very valuable application of itſelf, or when brought into a kind of ſoap by ſpirit of ammonia. Palm oil with camphor, makes a common and very excellent liniment of the ſtimulating and diſcutient kind. It is yellow and of the conſiſtence of butter. Muriated ammonia in very fine powder, rubbed with camphorated palm-oil, makes a moſt active and valuable liniment.

Camphor is often mixed with reſinous ſubſtances in the harder and compound plaſters and unguents. Here the apothecary ſhould be aware of the remarkable power of camphor

phor, in permanently ſoftening moſt reſinous ſubſtances, ſo that the proper conſiſtence of a plaſter will not allow more than a ſmall doſe of this ſubſtance. The ſtrong, diffuſible, and grateful odour of camphor is often of uſe in maſking the unpleaſant ſmell of other applications.

CAMPHORATA, in *Botany*, hirſuta (Bauh. pin.) monſpelienſium (Bauh. hiſt.) See Camphorosma *monſpeliaca*.

Camphorata *glabra*, (Bauh. pin.) See Camphorosma *glabra*.

Camphorata *africana*, umbellata (Comm. hort. 2. p. 79. tab. 40.) See Selago *corymboſa*.

CAMPHORATED, denotes a thing tinctured, or impregnated with camphor.

Spirit of wine camphorated, is a remedy frequently applied externally in caſes of inflammations, &c.

CAMPHOROSMA, in *Botany*, (from camphora and οσμη, *ſmelling of camphor*.) Linn. gen. 164. Schreb. 221. Willd. 257. Lam. Illuſt. 236. Juſſ. p. 84. (Camphorata, Tourn. act. 1705.) Claſs and order, *tetrandria monogynia*. Nat. ord. *Holoraceæ*, Linn. *Atriplices*, Juſſ. *Chenopodeæ*, Vent.

Gen. Ch. *Cal.* perianth pitcher-ſhaped, four or five cleft half way down, compreſſed, permanent; ſegments acute; two oppoſite ones larger than the other, recurved. *Cor.* none. *Stam.* filaments four or five, thread-ſhaped, equal; anthers oval. *Piſt.* germ egg-ſhaped, compreſſed; ſtyle thread-ſhaped, ſemibifid, longer than the calyx; ſtigmas acute. *Peric.* capſule one-celled, covered with the calyx. *Seed* one, oval, compreſſed, ſhining.

Eſſ. Ch. *Calyx* pitcher-ſhaped: two oppoſite ſegments larger. *Corolla* none. *Capſule* one-ſeeded.

Sp. 1. C. *monſpeliaca*, Linn. Sp. Pl. Lam. Ill. Pl. 86. (Camphorata hirſuta, Bauh. pin. 486. Rai hiſ. 210. Tourn. Act. 1705. p. 313. Buxb. Cent. 1. p. 18. tab. 28. fig. 1. Camphorata monſpelienſium, Bauh. hiſt. 3. p. 379. Lob. Adv. 174. and Ic. 403. Selago ſ. Camphorata, Lugd. 1201.) "Leaves linear-awl-ſhaped, hairy; flowers in cloſe axillary cluſters." *Root* perennial. *Stems* about a foot high, ſhrubby, branched; branches numerous, round, long, hairy, whitiſh at their ſummit. *Leaves* alternate or ſcattered, cloſely ſet, ſmall, rather ſtiff. *Flowers* ſmall, green, pubeſcent without, ſometimes five-cleft. The leaves when rubbed between the fingers ſmell ſomething like camphor. The whole plant abounds in a volatile oily ſalt, and is warm and ſtimulating. An infuſion of it in a doſe from half an ounce to an ounce and a half is ſaid to be of ſervice in the aſthma. A native of a ſandy ſoil in Tartary, Spain, and the ſouth of France. 2. C. *acuta*, Linn. Sp. Pl. Pollich. pal. 4. 167. "Leaves awl-ſhaped, rigid, ſmooth." *Root* perennial, ſlender, ſpindle-ſhaped. *Stems* numerous, ſhrubby, decumbent, round, hairy, roughiſh, branched, from two or three inches to a foot in height; branches alternate. *Leaves* alternate, ſeſſile, entire, ciliated at the baſe, ſmall, pubeſcent, ſoft. *Flowers* ſmall, ſeſſile, axillary, growing two together; calyx roundiſh, hairy; ſegments five, ciliated; ſtamens five; longer than the flower; anthers roundiſh, yellow; germ egg-ſhaped, rather acute. Pollich. A native of dry ſandy fields in the Palatinate, Italy, and Tartary. La Marck obſerves that he is unacquainted with this ſpecies, and that as anthyllis altera Italorum, quoted by Linnæus as a ſynonym, appears to him to belong to ſtellera paſſerina, he ſuſpects that the ſame plant has been inſerted twice in the Species Plantarum, under different names. But as ſtellera paſſerina is alſo deſcribed by Pollich, in his hiſtory of plants growing in the Palatinate, the conjecture of La Marck does not ſeem to be well founded. 3. C. *glabra*, Linn. Sp. Pl. Bauh. pin. 486. Dalech. hiſt. 1179. "Leaves ſomewhat three ſided, ſmooth, unarmed." A native of Switzerland. This ſpecies is obſcure. Haller in the firſt edition of his Swiſs plants, keeps it and polycnemum [illegible] ſeparate, both under the name of camphorata; but in the ſecond edition he puts the ſynonym of camph. glabra Bauh. pin. to his polycnemum. Reichard and La Marck complain that they could not find in Haller the ſynonym referred to by Linnæus. 4. C. *paleacea*, Linn. jun. Supp. 128. "Shrubby; branches ſpike-ſhaped, chaffy, hairy." An evergreen ſhrub, ſcarcely a foot high, regularly branched; branches alternate, covered with chaff; hairs, leaves, and flowers imbricated and intermingled, and all ſo ſmall as to be ſcarcely diſcernible by the naked eye. *Chaff* membranous, white. *Leaves* elliptical, ſmooth, ſeſſile. *Calyx* four-leaved. *Petals* four, very ſhort, ciliated, obtuſe. *Stamens* four, ſcarcely longer than the calyx. *Germ* ſuperior. *Style* capillary. *Stigma* ſimple. A native of the Cape of Good Hope. La Marck obſerves in Encyc. that he believes it to belong to a different genus; he has, nevertheleſs, continued it under camphoroſma, in his Illuſtrations; although nothing can be more evident than its inconſiſtence with the generic character. Willdenow juſtly remarks that the flowers of all the ſpecies require a more accurate examination, and that the generic character cannot be conſidered as fixed. 5. C. *Pteranthus*, Linn. Mant. p. 41. Lam. Enc. vol. i. p. 523. Willd. Mart. (Pteranthus dichotomus, Forſk. Ægypt. 36. Lam. Ill. Pl. 764. Juſſ. 404. Vent. vol. iii. 534. Louichea cervina, l'Herit. Stirp. 1. p. 135. tab. 65. Pteranthus echinatus, Deſfontaines flor. atlan. vol. i. p. 145. Poiret. Enc. vol. v. p. 707.) "Much branched; peduncles ſword-ſhaped, dilated; bractes creſted." *Root* annual, fibrous. *Stems* herbaceous, jointed, dichotomous, or trichotomous below, and much branched above; lower branches in whorls, upper ones oppoſite. *Leaves* in whorls, linear, ſmooth, obtuſe, unequal in ſize. *Flowers* in the fork of the ſtem, and at the ſummits of the branches, green, ſmall; peduncles (common receptacle, Vent.) inverſely conical, compreſſed, ſtriated, hollow, trichotomous at their ſummit; pedicels (partial receptacles, Vent.) ſimilar to the peduncles, each bearing ſeven flowers; one fertile in the centre, with three on each ſide, of which two are barren, and that between them fertile; calyx four-cleft; two oppoſite ſegments oblong, concave, terminated by a recurved point; the two others larger, furniſhed on each ſide near the ſummit with a creſt or membranous wing; ſtamens ſhort; filaments awl-ſhaped, a little united at their baſe; ſtyle bifid; ſtigmas ſimple. *Capſule* rather globular, one-celled, one-ſeeded, not opening. A native of Ægypt and of the kingdom of Tunis, where it flowers all the winter and in the beginning of ſpring. The French botaniſts have formed for it a diſtinct genus on account of its capſule, which does not open at the top, as in the other ſpecies. But unwilling to increaſe the number of genera without abſolute neceſſity, eſpecially in ſo lax a genus, we have followed Willdenow and Martyn in keeping it where Linnæus placed it. The deſcription given by the Swediſh naturaliſt is, however, by no means ſatisfactory: in the ſpecific character, he ſeems to have miſtaken the larger ſegments of the calyx for bractes. We have formed our deſcription from thoſe of Juſſieu, Ventenat and Poiret, compared with La Marck's figure.

Camphorosma, (Mor. hiſt. 3. p. 366. tab. ii. fig. ult.) See Dracocephalum *canarienſe*.

CAMPHUYSEN, Dirk Theodore Raphael, in *Biography*, a painter of landſcapes, cattle, and moon-lights, was born at Gorcum, in 1586, and having learned the art of painting from Diederic Govertze, ſoon not only equalled, but far ſurpaſſed his maſter. He ſtudied nature with judgment and diligence; his pencil was remarkably tender and ſoft; his colouring a juſt repreſentation of nature, and very tranſparent; and his perſpective accurate and well contrived. His pictures, as he left off painting at the age of 18 years, are ſcarce, and fetch conſiderable prices. When he relinquiſhed his profeſſion, he became tutor to the ſons of lord Nieuport, and was recompenſed for his diſcharge of the truſt with the office of ſecretary to that nobleman. The deſigns which he executed by drawing with a pen are highly valued. Pilkington.

CAMPI, MICHAEL, and BALTHASAR, two diſtinguiſhed botaniſts of Lucca, flouriſhed in the early part of the 17th century. Well inſtructed in the writings of Dioſcorides, and of the Arabians, they compared the plants deſcribed by them, with thoſe uſed in the ſhops under the ſame name, which in ſome inſtances they found to be erroneous. They alſo in their excurſions over the Alps, diſcovered ſeveral plants not before known. The works publiſhed by them are, "Nuovo Diſcorſo, &c." 1623, 4to. in which they examine ſome of the articles uſed in the compoſition of the Mithridate. "Del Balſamo," Lucca 1639, 4to. "Specilegio Botanico," 1654, 4to. in which they attempt to ſhew, that the cinnamom now uſed, is not the ſame as the plant deſcribed under that name by Dioſcorides. Haller Bib. Bot.

CAMPIAN, EDMUND, a diſtinguiſhed popiſh martyr in the reign of queen Elizabeth, was born at London 1540, and brought up at Chriſt's hoſpital. He was admitted a ſcholar of St. John's college at Oxford, in 1553, and having taken his degree of M. A. in 1564, entered into orders, and became an eloquent Proteſtant preacher. When queen Elizabeth viſited the univerſity in 1566, he delivered an elegant oration and kept an act in her preſence, with great applauſe. In 1568, he went to Ireland, where he became a convert to popery; and upon being diſcovered in making proſelytes, he was apprehended. However, he made his eſcape into England, and from thence into the Low Countries, and entered into the Engliſh college at Douay. At Rome he was admitted into the ſociety of Jeſuits; and having been ſent by the general of the order into Germany, he at length ſettled at Prague, and for ſix years taught rhetoric and philoſophy in the Jeſuits' college. Having eſtabliſhed his reputation for recovering to the church many perſons who had ſeparated from it, he was recalled to Rome, and deputed by Gregory XIII. in 1580, on the dangerous miſſion to England. Here he was zealous in his endeavours by his diſcourſes and writings to make proſelytes; and he procured to be printed at a private preſs, and induſtriouſly circulated at Oxford, a kind of challenge to the clergy, entitled, "Rationes decem oblati certaminis in cauſa fidei, redditæ Academicis Angliæ." After he had for ſome time concealed himſelf, he was at length diſcovered in diſguiſe at the houſe of a gentleman in Berkſhire, and conveyed to the tower in proceſſion, with a paper affixed to his hat, on which was an inſcription, "Edmund Campian, a moſt pernicious Jeſuit." Soon after, he was convicted of a charge of high treaſon, and in December, 1581, he was hanged and quartered at Tyburn. None have queſtioned his abilities, honeſty, and moral character: and it has been alſo allowed, that he was well ſkilled in the learning of his age and profeſſion. Among ſeveral works, written by him, were "An Univerſal Chronology" and a "Narrative of the Divorce of Henry VIII. from his Queen Catharine," both in Latin; and "Various Conferences on Religion held with Proteſtant Divines in the Tower of London." Whilſt he was in Ireland he wrote in 1570, two books of the hiſtory of that kingdom, publiſhed by ſir James Ware, at Dublin, in 1633. Wood's Athen. Oxon. Nicholſon's Hiſtor. Library. Moreri.

CAMPICURSIO, in the *Ancient Military Art*, a march of armed men for ſeveral miles, from and back again to the camp, to inſtruct them in the military pace. This exerciſe was nearly akin to the *decurſio*, from which it only differed, in that the latter was performed by horſemen, the former alſo by foot.

CAMPIDOCTORES, or CAMPIDUCTORES, in the *Roman Army*, were officers who inſtructed the ſoldiery in the diſcipline and exerciſes of war, and the art of handling their weapons to advantage. Theſe are alſo ſometimes called *campigeni* and *armidoctores*.

CAMPIDUCTOR, in *Middle Age Writers*, ſignifies the leader or commander of an army, or party.

CAMPIGLIA, in *Geography*, a town of Italy, in the duchy of Tuſcany; 26 miles S. of Volterra.

CAMPILLO, a town of Spain, in the county of Seville; three leagues W. of Antequera.

CAMPION, FRANÇOIS, in *Biography*, one of the claimants to the invention of *La regle de l'octave*. It is recorded in Walther, that beſides ſeveral uſeful elementary tracts for the Theorbo and Guitar, in 1705, he publiſhed a treatiſe on accompaniment and compoſition, according to the rules of the octaves, a work generally uſeful for tranſpoſition, to all thoſe who ſtudy ſinging and ſtringed (keyed) inſtruments, or even a ſingle baſe part, which it will inform them how to figure.

CAMPION, in *Botany*. See AGROSTEMMA, CUCUBALUS, LYCHNIS, and SILENE.

CAMPION, in *Geography*, a town of Tartary, which was the capital of the kingdom of Tangut, or of the country lying immediately to the N.W. of the Chineſe province of Shenſi, and formerly remarkable for being a place through which the caravans paſſed in the road from Bucharia to China. It is diſtant 60 miles N. from the great wall of China. N. lat. 40° 25′. E. long. 104° 53′.

CAMPIONI, in *Biography*, an agreeable French compoſer of the Italian ſchool, ſtudent in 1770 at Sienna; whence removing to Florence, he was taken into the ſervice of the grand duke, and compoſed a Te Deum for the birth of his imperial highneſs's eldeſt daughter, full of curious canons and other ingenious contrivances, which was performed by a band of 200 voices and inſtruments. But though this compoſition was with propriety written *alla Paleſtrina*, his printed trios were in the modern Italian ſtyle, and in great favour in England, for more than 10 years, during the middle of the laſt century. They were in an eaſy and graceful taſte, and pleaſed univerſally till the ſuperior force and genius of the elder Stamitz and Boccherini, created new wants and expectations.

CAMPISTRON, JOHN GUALBERT, a French dramatic writer, was born at Toulouſe in 1656, and manifeſted an early taſte for poetry. Being diſcouraged from indulging it by his friends, he abruptly left them, and went to Paris, where he put himſelf under the direction of Racine. His firſt compoſitions were two tragedies, entitled "Virginia" and "Arminius," which were followed by two others of ſuperior merit and more permanent reputation and popularity, viz. "Andronicus" and "Alcibiades." He was recommended by Racine to the duke of Vendôme, as a proper perſon for compoſing a new opera for a magnificent feſtival which he was preparing to give to the dauphin. The piece produced on this occaſion was the heroic paſtoral of "Acis and Galatea," which being the means of introducing him to the duke, laid the foundation of his fortune. The duke, engaged by his talents for converſation and conviviality,

ality, took him as a companion in his campaigns, and advanced him to ſeveral offices of honour and emolument. The circumſtance by which he contributed to the advancement of Alberoni, has been mentioned under that article. Campiſtron, tired at length, both of the camp and the court, withdrew to his native city, of which he was appointed, in 1701, “ Capitoul,” or chief magiſtrate, and in the ſame year he was admitted a member of the French academy. In 1710 he married, and paſſed the remainder of his life in the circle of his family and friends. His death was occaſioned by an apoplexy in 1723. Beſides the dramatic pieces already mentioned, he publiſhed ſeveral others, among which are his “ Phocion,” “ Adrian,” “ Tiridates,” “ Phraates,” and “ Jaloux deſabuſé :” and theſe contributed to ſupport the reputation of the French theatre, though in an inferior degree, after it had loſt Corneille and Racine; neither of whom he could rival. His ſtyle, however, was pure, natural, and ſometimes elegant; but his diſtinguiſhing excellence conſiſted in the diſpoſition of his plans, the modelling of his characters, and the knowledge of ſtage-effect. Nine editions of his “ Theatre” were printed at Paris during his life; but the laſt and beſt was publiſhed ſince his death, in 1750, in 3 vols. 12mo. His brother, Louis Campiſtron, was a Jeſuit, and cultivated French poetry. He alſo wrote funeral orations on the death of Louis XIV. and the dauphin. He died in 1733, aged 77. Moreri. Nouv. Dict. Hiſt.

CAMPIPARS. See CHAMPART.

CAMPITÆ, in *Church Hiſtory*, an appellation given to the Donatiſts on account of their aſſembling in the fields for want of churches. For a ſimilar reaſon, they were alſo denominated *Montenſes* and *Rupitani*.

CAMPITELLO, in *Geography*, a town of the iſland of Corſica; 14 miles S. of Baſtia.

CAMPO, a town of Italy, a fief of the empire, in the ſtate of Genoa; 13 miles N.W. of Genoa.

CAMPO *Baſſo*, a city of Naples, and capital of the Moliſe, ſeated in a fertile plain, producing all the neceſſaries of life. The air is ſalubrious, and the inhabitants, eſtimated at about 6000, carry on a conſiderable trade in articles of cutlery.—C. *Foſto*, a town of Naples, in the province of Abruzzo Ultra.—C. *Liatto*, a town of Naples, in the county of Moliſe; 14 miles E. of Moliſe.—C. *Maggiora*, a town of Naples, in the province of Baſilicata; 14 miles S.E. of Acerenza.—Alſo, a town of Italy in the Tortoneſe, belonging to Piedmont.—C. *Marino*, a town of Naples, in the province of Capitanata; 3 miles S.E. of Termoli.—C. *Marone*, a town of Genoa, deriving its name from the quantity of mulberries growing in its vicinity; 11 miles N.N.W. of Genoa.—C. *Mayor*, a fortified town of Portugal, in the province of Alentejo, containing about 5300 inhabitants; 10 miles N.W. of Badajos in Spain. N. lat. 38° 50′. W. long. 7° 24′.—C. *Marto*, a place of Italy, in the duchy of Piacenza, near which Hannibal is ſaid to have defeated the Romans.—C. *St. Pietro*, a town of the ſtate of Venice, in the Paduan; 18 miles N. of Padua.

CAMPOBELLO, a town of Sicily, in the valley of Mazara; 14 miles N.E. of Girgenti.

CAMPO-BELLO, a long and narrow iſland on the eaſt coaſt of Waſhington county, in the diſtrict of Maine, in America, and the north-eaſternmoſt of all the iſlands of the diſtrict. The north end of this iſland lies in about N. lat. 44° 48′. The ſouth end is 5 miles north-weſterly from Grand Manan iſland.

CAMPOCHIARO, a town of Naples, in the county of Moliſe; 11 miles S. of Moliſe.

CAMPOLI, a town of Naples, in the province of Abruzzo Ultra; 3 miles N. of Teramo. N. lat. 42° 38′. E. long. 13° 55′.

CAMPOLONGO, ÆMILIUS, in *Biography*, born at Padua in 1550, and applying early to the ſtudy of medicine, attained ſuch eminence as to be noticed, and employed by the firſt families in the city; and in 1578 to be appointed profeſſor in that ſcience, an office he continued to hold till the time of his death in 1604. The principal of his works are, “ De Variolis, et de Arthritide,” 4to. 1586; taken principally from the works of Galen, in which he was intimately converſant. “ Methodi Medicinales,” conjointly with Alb. Bottono, 8vo. “ Nova cognoſcendi Morbos Methodus,” 1601, 8vo; and after his death, from his papers, “ De Lue Venerea, Libellus,” Patav. 1625, fol.; and “ De Vermibus, de Uxoris Affectibus, et de Morbis cutaneis,” 1636. Aſtruc de Morb. Ven. Haller. Bib. Med.

CAMPOMANESIA, in *Botany*. Boſc Nouveau Dict. Flor. Peruv. Claſs and order, *icoſandria monogynia*. Nat. ord. *Heſperideæ*, Linn. *Myrti*, Juſſ.

Gen. Ch. *Cal.* perianth five-cleft, permanent: ſegments egg-ſhaped. *Cor.* petals five, egg-ſhaped, concave. *Stam.* numerous, inſerted on the calyx. *Piſt.* germ inferior: ſtyle inclined: ſtigma target-ſhaped, umbilicated. *Peric.* berry globular, compreſſed, one-celled, crowned with the calyx. *Seeds* about twelve, kiney-ſhaped, attached to a fleſhy receptacle. A tree found in Peru, of which no farther details are given. Boſc obſerves, that it is an intermediate genus between Myrtus and Piſidium, and that it appears to agree with Decaſpermum, a genus formed by Forſter, for a plant which has ſince been received as a Piſidium. The preſent plant, perhaps, ought to be admitted into the ſame genus. The form of the ſtyle, and the manner in which the ſeeds are attached to the receptacle, ſeem to conſtitute the only difference. To aſcertain what ought to be the preciſe boundaries of a genus, and to determine what particulars, in the ſtructure of the parts of fructification, ſhould be conſidered as ſolid generic diſtinctions, is a problem which has not hitherto been, and probably may not be, reſolved for many ages yet to come.

CAMPORA, in *Geography*, a town of Naples, in the Principato Citra; 15 miles N.W. of Policaſtro.

CAMPRA, ANDREW, in *Biography*, a French muſician, born at Aix, in 1660, ſettled at Paris in 1685, and firſt became known by the compoſition of motets for the churches and private concerts. He afterwards devoted his talents to compoſitions for the opera, and almoſt rivalled the celebrated Lulli. He ſet a number of ballets and ſerious operas, which are ſtill occaſionally performed; and alſo publiſhed various kinds of muſic, which have been held in eſtimation. The king appointed him muſic-maſter of the royal chapel, and gave him a penſion. He died at Verſailles in 1744. Moreri.

CAMPREDON, in *Geography*, a town of Spain, in the province of Catalonia, at the foot of the Pyrenées, taken by the French, who deſtroyed its fortifications in 1691, and again in 1794; 27 miles N.N.W. of Gerona. N. lat. 42° 20′. W. long. 1° 56′.

CAMP-SHEETING, CAMP-*ſhot*, or CAMPSTEAD, in *Inland-Navigation*, denotes a facing of piles and planks in the front of banks or wharfs, to prevent the banks being worn away.

CAMPSIS, in *Botany*, (Loureiro). See INCARVILLEA.

CAMPTON, in *Geography*, a ſmall townſhip of America, in Grafton county, New Hampſhire, ſituate on the eaſt bank of Pemigawaſſet, the north head water of Merrimack river; 67 miles N.W. of Portſmouth. It was incorporated in 1761, and contains 395 inhabitants. N. lat. 43° 51′.

CAMPUGIALI, in *Geography*, a town of the duchy of Tuſcany; 9 miles W.N.W. of Arezzo.

CAMPUS, in *Antiquity*, a field or vacant plain in a city not built on, left vacant either on account of ſhews, combats, exerciſes, or other uſes of the citizens.

Campus *Maii*, in *Ancient Cuſtoms*, an anniverſary aſſembly of our anceſtors, held on May-day; where they confederated together for defence of the kingdom againſt all its enemies.

Campus *Martius*, a large plain field in the ſuburbs of ancient Rome, lying between the Quirinal and Capitoline mounts, and the Tiber; thus called becauſe conſecrated to the god Mars, and ſet apart for military ſports and exerciſes, to which the Roman youth were trained; as the uſe and handling of arms, and all manner of feats of activity. Here the races were run, either with chariots or ſingle horſes; here alſo ſtood the *villa publica*, or palace for the reception of ambaſſadors, who were not permitted to enter the city. Many of the public *comitia* were held in the ſame field, part of which, for that purpoſe, was cantoned out. The place was alſo nobly decorated with ſtatues, arches, columns, porticos, and the like ſtructures.

Campus *Martius* is alſo uſed in a more general ſenſe by *Middle Age Writers*, for any large plain open place near a great city, wherein the inhabitants were trained to the exerciſe of arms. Of ſuch we find mention at Verona, Tries, Dornic, and even Conſtantinople.

Among the French, *campus martius* was an appellation given to the yearly aſſemblies of the people called by the kings, either for enacting new laws, or deliberating on the great affairs of the nation. They were thus denominated, either becauſe uſually held in the month of March, or in imitation of the *campus martius* of the Romans, which was allotted for the like uſe. In aftertimes they were called *campus majus*, and by corruption, *campus madius*, and *magius*, becauſe the time of holding them was altered by Pepin to the month of May. Under the third line of kings, their aſſemblies took the denomination of ſtates-general, *états generaux*.

Campus *Sceleratus*, a place without the walls of ancient Rome, where the veſtals, who had violated their vow of virginity, were buried alive. See Burying *alive*.

CAMPYLUS, in *Botany*. Boſc. Nouv. Dict. Claſs and order, *pentandria monogynia*.

Gen. Ch. *Cal.* perianth tubular, hairy, tubercled: border five-cleft; ſegments unequal. *Cor.* monopetalous, tubular, bilabiate: upper lip awl-ſhaped; lower lip egg-ſhaped. *Stam.* filaments five, unequal. *Piſt.* germ ſuperior: ſtigma five-lobed. *Peric.* capſule nearly globular, five-celled, many-ſeeded.

Eſſ. Ch. Capſule five-celled. Corolla bilabiate. A ſhrub. *Stem* nearly ſimple, climbing. *Leaves* heart-ſhaped, acute, entire, hairy, petioled, ſometimes alternate. *Flowers* reddiſh white, in long, terminal, zig-zag racemes: bractes three-lobed. A native of dry mountains in China.

CAMRUP, in *Geography*, a diſtrict of Aſam, (which ſee) on the ſide of Dacſhincul, ſituate between three high mountains, at the diſtance of four days' journey from Ghergong. It is remarkable for bad water, noxious air, and confined proſpects. It was the part to which the raja baniſhed thoſe of his ſubjects with whom he was angry.

CAMTOOS, a river of ſouthern Africa, on the ſouth coaſt of the colony of the Cape of Good Hope, formed by a collection of waters from the ſame part of the country with thoſe of the Gauritz river (which ſee), but ſomewhat more eaſterly. It falls into a wide bay of the ſame name, in which the only ſecure anchorage is oppoſite to the mouth of a ſmall ſtream called the "Kromme," or crooked river. Though Camtoos river, juſt within the mouth, is a wide baſon, deep enough to float a ſhip of the line, yet the bar of ſand acroſs the mouth is fordable upon the beach at high water, and frequently dry at low water. Barrow's Africa, vol. ii.

CAMUDOLANUM, in *Ancient Geography*. See Camalodunum.

CAMUL, in *Geography*, a town of Tartary, at the extremity of the kingdom of Cialis, and on the borders of that of Tangut. N. lat. 37° 15'. E. long. 98° 5'.

CAMULODUNUM, in *Ancient Geography*. See Camalodunum.

CAMUNIUM, in *Botany*. See Murraya *exotica*.

CAMUNLODUMUM, in *Ancient Geography*, a town of Albion, aſſigned by Ptolemy to the Brigantes, and placed by Horſley at Gretland, near the river Calder, in Yorkſhire; but Camden and Baxter place it near Almondbury, about ſix miles from Halifax, on the ſame river. Roman antiquities have been found at both theſe places, and there are ſtill viſible veſtiges of walls and ramparts. It ſeems to have been the ſame with the Cambodunum of the Itinerary of Antonine in the ſecond rout, between Calcaria or Tadcaſter, and Manucium or Mancheſter.

CAMURI, in *Ichthyology*, one of the ſynonymous names of Diodon Hystrix among old writers.

CAMUS, probably derived from καμπτω, *I bend*, a perſon with a low, flat noſe, hollowed or ſunk in the middle. The Tartars are great admirers of camus beauties. Rubruquis obſerves, that the wife of the great Genghis Kan, a celebrated beauty, had only two holes for a noſe.

Camus, John-Peter, in *Biography*, an eminent French prelate, was born at Paris in 1582, and nominated by Henry IV., on account of his diſtinguiſhed reputation, to the biſhopric of Bellay, before he had attained the canonical age, to which he was conſecrated in 1609, having previouſly obtained a diſpenſation from the pope. His attacks on the Mendicant orders, for their indolence and relaxed diſcipline, both from the pulpit and the preſs, were ſo acrimonious and ſevere, that the monks applied to cardinal Richelieu, in order to obtain a ceſſation of hoſtilities. His mode of attack, and ſtyle of preaching, may be diſcovered in the following paſſages, extracted from his ſermons. "Fathers," ſays he, in a diſcourſe delivered before the Cordeliers on St. Francis's day; "Admire the greatneſs of your ſaint; his miracles ſurpaſs thoſe of the Son of God. Jeſus Chriſt, with five loaves and three fiſhes, only once in his life, fed 5000 perſons: St. Francis, with an ell of cloth, by a perpetual miracle, feeds daily 40,000 ſluggards." "My friends," ſuch was his delicate ſatire on another occaſion, "a young gentleman is recommended to your charity, who is not rich enough to make a vow of poverty." The biſhop, with a view of checking the ardour for reading romances, which prevailed in his time, and of directing it to ſome uſeful purpoſe, compoſed a number of rival works of a pious nature and tendency, which in ſome degree anſwered the purpoſe. After performing his epiſcopal duties with zeal and diligence for 20 years, he reſolved to withdraw from the world; and having obtained leave to reſign his biſhopric, he retired firſt to the abbacy of Aulney, and afterwards to the hoſpital of Incurables at Paris, where he died in 1652, after refuſing two conſiderable biſhoprics. Camus was diſtinguiſhed by a lively and warm imagination; and he compoſed with wonderful facility, in a ſtyle that was partly grave and partly burleſque, abounding with ſingular metaphors and images, often ſtriking and ſometimes ludicrous. He is ſaid to have written 200 volumes, conſiſting of homilies and tracts, moral and devotional, pieces againſt the monks, pious novels, paſtoral directions, &c. His works, that are now read are, "L'Eſprit de S. François de Sales," 6 vols. 8vo. reduced to one by a doctor of the Sorbonne; and "L'Avoiſinement des Proteſtans avec l'Egliſe Romaine," republiſhed in 1703 by Richard Simon, under the title of "Moyens de reunir les Proteſtans avec l'Egliſe Romaine." Simon aſſerted, that Boſſuet's expoſition

poſition of the Cathólic faith was no more than this work in a new dreſs. Moreri. Nouv. Dict. Hiſt.

Camus, Stephen le, a French prelate, diſtinguiſhed by his penitence, mortification, and attention to the duties of his profeſſion, was born at Paris in 1632, and became a doctor of the Sorbonne in 1650. In early life he was borne away by the torrent of court diſſipation; but reſolving on reformation, he was nominated by the king in 1671, after having been his almoner for ſeveral years, to the biſhopric of Grenoble. His general conduct correſponded to the outward tokens of penitence which he manifeſted. "He always wore a rough hair-ſhirt and lay upon ſtraw. He roſe at two in the morning, recited his breviary, read the Scriptures, and at five called up a domeſtic who wakened the others. At half paſt five he read the common prayers, recited prime at ſix, and then ſaid maſs. He then retired to his cloſet till nine, when he gave audience. At eleven he dined with his houſehold. His chaplain ſat next him; and at another table were his ſteward and domeſtics. One of the lacqueys read. To the prelate were ſerved legumes only, with a ſmall meaſure of wine, half of which was reſerved for the deſſert. He went to reſt at eight. Such was the mode of living of this man, who was a prince as well as a biſhop." Some time before his death, when his bodily infirmities increaſed, an order was procured from the pope to add fiſh and fleſh to his diet. In viſiting his dioceſe, for which he devoted three months in every year, he commonly travelled on foot; and viſiting 100 pariſhes in a year, he completed his tour of the whole in three years. He everywhere preached with the ſame zeal, and diſtributed alms to the utmoſt extent of his revenue. He founded a number of charitable eſtabliſhments. In 1686 pope Innocent XI., from a mere regard to his virtues, advanced him to the cardinalate. He died in 1707, and made the poor his heirs. His publications were Paſtoral Letters to his Clergy, a collection of excellent Synodal Ordinances, and a Diſſertation in proof of the perpetual virginity of the virgin Mary. Moreri.

Camus, in *Ancient Geography*, a town of Aſia, placed by Polybius in Cæleſyria.

CAMYROS, in *Ancient Geography*. See Camiro.

CAN, in *Sea-Language.*—A pump's *can*, is a ſort of wooden jug or pitcher, wherewith ſeamen pour water into pumps to make them work.

Can-*buoy*. See Buoy.

Can-*hook*, an inſtrument uſed to ſling a caſk by the ends of the ſtaves: it conſiſts of a broad and flat hook fixed to each end of a ſhort rope, and the tackle which ſerves to hoiſt or lower it is faſtened to the middle of the rope.

CANA, in *Entomology*, an European ſpecies of apis, of a grey colour, with the ſegments of the abdomen edged with whitiſh. Muſ. Leſk.

Cana, in *Ornithology*, a ſpecies of motacilla, of a cinereous colour; with the quill feathers edged with whitiſh; tail feathers black, the exterior ones nearly all white. Gmel. &c.

Obs. This is the grey-throated warbler of the Arctic Zoology. Buffon calls it Figuier cendré à gorge cendrée. It inhabits Louiſiana.

Cana, in *Ancient Geography*, the name of two cities of Galilee in Paleſtine; one called by Jerom *Cana the Greater;* the other, *Cana the Leſſer*, or commonly Cana of Galilee. The former is mentioned by Joſhua (chap. xix. 28.) and was ſituated in the tribe of Aſher; the latter, which is more frequently mentioned in the ſacred writings, (See John II. i. 11. iv. 46. xxi. 2.) was ſeated in the tribe of Zebulun, N.W. of the ſea of Galilee or of Tiberias, or the lake of Genneſareth, on the confines of the upper and lower Galilee. This was the country of the apoſtle Simon, hence called the Canaanite (Matt. x. 4.) and of Nathaniel (John xxi. 2.); here Jeſus wrought his firſt miracle; and as it was ſituated to the north of Capernaum, he is ſaid to have gone down from Cana to this city; and after his return thither, the nobleman whoſe ſon was ſick at Capernaum viſited him there. It is of this Cana that Joſephus ſpeaks in his Life: p. 1005 and 1029.

Cana, or Kanah, a town of Paleſtine in the tribe of Ephraim, according to Euſebius and Jerom; and alſo a river of the ſame name on the weſtern limit of the territory of the Ephraimites. Joſh. xvi. 8. xvii. 9.

Cana, a promontory of Æolia, with a ſmall town and mountain adjoining to it, at the termination of the bay of Adramyttium.

Cana, a town in Cœleſyria. See Canath.

Cana, in *Geography*, one of the ſmaller weſtern iſlands of Scotland, about 8 miles S.W. from the iſland of Skye. N. lat. 57° 49'. W. long. 6° 40'.

Cana, El, a town of Aſiatic Turkey, in the province of Aladulia; 36 miles S. W. of Malatia.

CANAAN, in *Scripture Biography*, the fourth or youngeſt ſon of Ham, according to the order in which his name is introduced in Geneſis, ch. x. 6. The Hebrew word כנען is derived from כנע, to *humble* or *abaſe*, and with the נ *nun* ſervile it denotes a *merchant* or *trader*, as the Canaanites or Phœnicians were. If we join the כ and נ, or *ch* and *n* into one ſyllable, and pronounce it as the Jews do, the word will be Chnaan, and it will more nearly reſemble the Chna of Sanchoniatho and Stephanus Byzantinus. The time of his birth and the length of his life are not known; but ſome have ſuppoſed that he was born in the ark during the period of the deluge, and it has been fancifully ſaid that he was a wicked man, becauſe he was the fruit of an unſeaſonable incontinence. The irreverent action of Ham in diſcovering the nakedneſs of his father Noah was retaliated on Canaan. To this purpoſe Noah, with the ſpirit of prophecy, pronounces his malediction on this branch of his poſterity, "Curſed," ſays he, "be Canaan; a ſervant of ſervants ſhall he be unto his brethren." Gen. ix. 25. As this curſe was denounced, not againſt Ham the immediate trangreſſor, but againſt his ſon, who does not appear, from the words of Moſes, to have been at all concerned in the crime, many conjectures have been employed to ſolve this difficulty in the ſacred hiſtory. Some commentators apply the term קטן, or younger ſon in ch. ix. 24. to Canaan; and imagine that he joined with his father Ham in this mockery and inſult upon Noah; and the Jewiſh rabbins have a tradition, that Canaan was the firſt who ſaw Noah in this poſture, and then went and called his father Ham and concurred with him in his act of irreverence. Origen in Geneſ. p. 33. vol. ii. ed. Benedict. Bocharti Phaleg. l. iv. c. 37. col. 308. But this is a very arbitrary and unfounded method of interpretation; becauſe no previous mention was made of Canaan, and of what he had done, but only of Ham the father of Canaan; and of him, therefore, the phraſe of "little ſon" or "youngeſt ſon" muſt be underſtood. Others have alleged, that this curſe was ſo far from being pronounced upon Canaan for his father Ham's trangreſſion that it was not pronounced for his own, nor was it executed ſeveral hundred years after his death. It is in reality to be underſtood not ſo properly of Canaan, as of his deſcendants, the Canaanites. Accordingly, it is ſaid, that God, foreſeeing the wickedneſs of this people, which began with their father Ham, and greatly increaſed in this branch of his family, commiſſioned Noah to pronounce a curſe upon them, and to devote them to the ſervitude and miſery, which their more common vices and iniquities would deſerve. It is added, that this account was written by Moſes for the encouragement of the Iſraelites, to ſupport and animate them in their expedition againſt a people, who by their ſins had forfeited the divine protection, and were deſtined to ſlavery from the days of Noah.

Some biblical critics have propoſed to correct the text, ſuppoſing that Canaan is here erroneouſly placed for Ham, which is the reading of the Aldine edition of the LXX. and of 7 of Holmes's MSS. Others ſuppoſe that חם אבי, *Ham the father of*, are wanting before Canaan, and ſupply them accordingly; partly from the Arabic verſion כנעאן אבו, and partly from the rules of Hebrew metre, laid down by biſhop Hare; חם אבי being neceſſary to fill up the verſe. But neither of theſe authorities, ſays Dr. Geddes, is ſufficient to juſtify an alteration in the preſent text, in which there is no variety of reading either in the Samaritan or Hebrew copies, and with which all the other ancient verſions perfectly agree. Beſides, if this alteration were allowed, it would not much mend the matter; for if Ham was only to be curſed, why curſe him under the denomination of the father of Canaan. The text, in Dr. Geddes's opinion, is ſufficiently clear as it ſtands; and highly expreſſive of what we may ſuppoſe to have been the feelings of Noah on this occaſion. On awakening, he learns that Ham had uſed him moſt irreverently, while his other ſons had ſhewed him that filial regard which was due to ſuch a venerable father. To expreſs his indignation at ſo infamous a conduct, he curſes Ham in his progeny, and in *him* of his progeny, who was, probably, moſt dear to him, as being his youngeſt ſon, perhaps juſt then born; and whoſe very name, which imports the idea of depreſſive humiliation, might readily offer a paronomaſiacal alluſion, ſo common in the maledictions and benedictions of the patriarchs. Dr. Geddes proceeds with reflections which we can by no means approve, and which, in our opinion, are altogether unneceſſary to vindicate this part of the Scripture hiſtory. "Whether this malediction," he ſays, "were prophetic or imprecatory; whether it were really made by Noah, or whether the whole be not a poſtliminious tale, contrived by the Hebrew hiſtoriographer for the purpoſe of throwing an odium on the Canaanites, and juſtifying the conqueſt of their country; are points which I mean not now to diſcuſs: but it is pretty clear, that the ſtory, true or falſe, is here introduced, to pave the way for a more ſpecial command from heaven to conquer and extirpate the Canaanite nations." See CANAANITES.

The curſe pronounced by Noah on Canaan was peculiar to this ſon of Ham and his poſterity, and does not ſeem to have extended to the reſt of his brethren. And, indeed, conſidered as a prophecy, the declaration that Canaan "ſhould be a ſervant of ſervants to his brethren," ſeems to have been wholly completed in him, though its accompliſhment was diſtant and gradual. It was completed with regard to Shem, not only becauſe a conſiderable part of the ſeven nations of the Canaanites were made ſlaves to the Iſraelites, when they took poſſeſſion of their land, as part of the remainder of them were afterwards enſlaved by Solomon; but alſo by the ſubſequent expeditions of the Aſſyrians and Perſians, who were both deſcended from Shem; and under whom the Canaanites ſuffered ſubjection, as well as the Iſraelites; not to mention the conqueſt of part of Canaan by the Elamites, or Perſians, under Chedorlaomer, prior to them all. With regard to Japheth, we find a completion of the prophecy, in the ſucceſſive conqueſts of the Greeks and Romans in Paleſtine and Phœnicia, where the Canaanites were ſettled; but eſpecially in the total ſubverſion of the Carthaginian power by the Romans; beſides ſome invaſions of the northern nations, as the poſterity of Thogarmah and Magog: wherein many of them were, probably, carried away captive. "Egypt," ſays biſhop Newton, "was the *land of Ham*, as it is often called in Scripture; and for many years it was a great and flouriſhing kingdom; but it was ſubdued by the Perſians and afterwards by the Grecians, and it has ever ſince been in ſubjection to ſome or others of the poſterity of Shem or Japheth. The whole continent of Africa was peopled principally by the children of Ham; and for how many ages have the better parts of that country lain under the dominion of the Romans, and then of the Saracens, and now of the Turks? In what wickedneſs, ignorance, barbarity, ſlavery, miſery, live moſt of the inhabitants? And of the poor negroes how many hundreds every year are ſold and bought like beaſts in the market, and are conveyed from one quarter of the world to do the work of beaſts in another?" "Nothing," ſays this prelate in the cloſe of his account of this prophecy, "can be more complete than the execution of the ſentence upon Ham as well as upon Canaan."

Canaan is ſuppoſed to have lived and died in a country called after his name. His poſterity was very numerous. His eldeſt ſon Sidon founded the city of Sidon, and was the father of the Sidonians and Phœnicians. His ten other ſons were the fathers of as many tribes, dwelling in Paleſtine and Syria: viz. the Hittites, Jebuſites, Amorites, Girgaſites, Hivites, Arkites, Sinites, Arvadites, Zemarites, and Humathites.

Canaan ſeems to have been known to the ancient heathens. Sanchoniatho occaſionally mentions Cnaa, who is known to be Canaan, as the firſt Phœnician. There is reaſon to think, ſays the learned Bryant, that by the Egyptians and other neighbouring nations, Canaan was expreſſed Cnaan. This by the Greeks was rendered χναας, and χνας; and in later times χνα, Cna. Bryant adds, that, by prefixing the term Υκ, uc, which is to be found in the compoſition of many words, particularly ſuch as are of Amonian original, Cnas or Canaan, was ſtyled Uc-nas, and the Gentile name or poſſeſſive was Uc-cnaos, Υκ κναος, which was changed by the Greeks into Κυκνειος, or Cucneus; and from Υκ Κνας they formed Κυκνος. Hence he derives the Cycnus of Lucian and the ancient poets, who was repreſented as the brother of Phaethon and transformed into a ſwan. With reſpect to Cycnus and his brotherhood, the vocal miniſters of Apollo, the ſtory, as he conceives, which is told of them undoubtedly alludes to Canaan, the ſon of Ham, and to the Canaanites, his poſterity. Accordingly he obſerves, that the ſwan was the enſign of Canaan, as the eagle and vulture were of Egypt, and the dove of Babylonia: and that, wherever we may imagine any colonies from Canaan to have ſettled and founded temples, there is ſome ſtory about ſwans. The Canaanites, it is ſaid, wherever they came, introduced their national worſhip; part of which conſiſted in chanting hymns to the honour of their country god, who was the ſame as Apollo of Greece; and on this account Lucian, in compliance with the current notion, ſays, that the Cycni were formerly the aſſeſſors and miniſters of that deity. By this, ſays Bryant, we are to underſtand, that people of this denomination were in ancient times his prieſts. Mede's works, vol. i. p. 378. Anc. Un. Hiſt. vol. i. p. 88. Geddes's Crit. Rom. vol. i. p. 76. Biſhop Newton on the Prophecies in his works, vol. vii. p. 11—23. 8vo. Leland's Deiſtical Writers, vol. iii. p. 254, &c. Bryant's Anal. Anc. Mythol. vol. i. p. 369, &c.

**CANAAN**, *land of*, in *Scripture Geography*, ſo named from

Canaan, the ſon of Ham, whoſe poſterity poſſeſſed this country as well as Egypt, or Mizraim, lies in the weſtern part of Aſia, and extends from about 31° to 33° 20′ N. lat. and from 34° 50′ to 37° 15′ E. long. It was bounded, to the north, by Cæle-Syria, or the mountains of Libanus and Anti-Libanus; to the weſt, by the Mediterranean ſea; to the eaſt, by Arabia Deſerta; and to the ſouth and ſouth-weſt, by Arabia Petræa and Egypt. Its extent has been variouſly aſcertained; but from the lateſt and moſt accurate computation, it was about 200 miles from north to ſouth, that is, from Dan or Cæſarea-Philippi to Beer-ſheba, and about 100 miles in breadth. According to this reduced extent, if we conſider its extraordinary fertility, the number of its inhabitants, and the many cities and villages which it contained, it was ſo far from being an inconſiderable ſpot of ground, as ſome have miſrepreſented it, that, excluſive of what it was in the reigns of David and Solomon, (Ezra, iv. 20.) and many ages after, it muſt have been always regarded as one of the moſt opulent and conſiderable kingdoms of the Eaſt; and it muſt be allowed, that the Iſraelites, according to the acknowledgment of the king of Tyre, (1 Kings, v. 7.) were a "great people." Indeed, the deſcription of its wealth, power, and population, ſeems very extraordinary; even allowing it to have been cultivated with the utmoſt diligence, by men well acquainted with every branch of agriculture.

Before the Iſraelites obtained the poſſeſſion of it, Moſes deſcribes it as a country ſingularly fertile and productive. See Deut. viii. 7, &c. Its wonderful fecundity was owing to ſeveral circumſtances; ſuch as the excellent temperature of the air, which was never ſubject to exceſſive heats or colds, the regularity of its ſeaſons, eſpecially the former and latter rain, and the natural fatneſs and fertility of its ſoil, which required neither dunging nor manuring. It was famous for its large and delicious grapes, for its palm-trees, and its dates, for its balſam ſhrub which produced the celebrated balm of Gilead, for the conſtant verdure of its fruit trees, and for its citrons and its oranges. Its vines yielded grapes twice, and ſometimes thrice, in a year; its honey was abundant; its inhabitants cultivated ſugar-canes with great aſſiduity; and their cotton, hemp, and flax, were moſtly of their own growth and manufacture. Its vicinity to Libanus afforded them an ample ſupply of cedars, cypreſſes, and other ſtately and fragrant trees. They fed large herds of cattle, both great and ſmall, and their hilly country afforded them not only variety and plenty of paſture, but alſo of water, that deſcended thence into the vallies and low lands, which it fertilized. But the moſt fertile paſture-grounds were on each ſide of the river Jordan, beſides thoſe of Sharon, or Sarona, the plains of Lydda, Jamnia, and ſome others, which were then juſtly famed for their fecundity. As for fiſh, their rivers, the lake of Tiberias, and the Mediterranean ſea, afforded great plenty and variety. The lake Aſphaltites yielded abundance of ſalt, with which they ſeaſoned and preſerved their fiſh, and which Galen affirms to have been preferable to any other. It ought further to be conſidered, that the country was then inhabited by an induſtrious people, who knew how to improve every inch of this land, and had made even the moſt deſert and barren places to yield ſome kind of produce, by proper care and manure, ſo that the very rocks, which now appear quite naked, produced corn, pulſe, or paſture; for every little hillock was formed into a terrace covered with mould, which, through the lazineſs of ſucceeding proprietors, has been ſince waſhed off by rains and ſtorms. The fecundity of Paleſtine hath been extolled even by Julian the apoſtate, a ſworn enemy to Jews and Chriſtians, who frequently, in his Epiſtles, mentions the perpetuity, as well as excellence and great abundance of its fruits and produce. The viſible effects of divine diſpleaſure, which this country has felt, not only under Titus Veſpaſian, but much more ſince that emperor's time, in the inundations of the northern barbarians, of the Saracens, and of the more cruel and deſtructive Chriſtians, during the holy war, and in the oppreſſion it now feels under the Turkiſh yoke, are cauſes more than ſufficient to have reduced the far greater part of the country into a mere deſert. If we were to judge by its preſent appearance, nature itſelf has rendered it incapable of cultivation.

The land of Canaan was divided into two unequal parts, of which the weſtern was conſiderably the greater, by the river Jordan, which riſes in the mountains of Hermon (a branch of the mountains of Libanus), and running ſouth through the lake of Genneſareth, or the ſea of Tiberias and Galilee, after a courſe of 150 miles, loſes itſelf in the Aſphaltite Lake, or the Dead Sea. See ASPHALTITE *Lake*.

The country to the eaſt of Jordan was given to the tribes of Reuben, Gad, and the half tribe of Manaſſeh; the kingdom of Moab lay to the ſouth; the kingdom of Ammon to the eaſt of Gad; and the mountains of Hermon bounded Manaſſeh to the north-eaſt, beyond which lay Trachonitis and Ituræa. Weſt of the Jordan, to the north, were placed Naphtali on the river, and Aſher, which bordered on Phœnicia and the Mediterranean. Zebulun and Iſſachar had inland diſtricts; but the other half tribe of Manaſſeh and Ephraim reached from the ſea to the river. Dan (upon the coaſt) and Benjamin, were ſouth of Ephraim, and north of Simeon and Judah. The country allotted to Simeon bordered upon the Mediterranean, and extended to Egypt; but the Philiſtines, who inhabited the coaſt, were never entirely driven out of their poſſeſſions. The country of Judah bordered upon the Dead Sea, which ſeparated it from the kingdom of Moab (for both Simeon and Judah lay conſiderably more ſouth than the tribe of Reuben), and adjoined the mountainous country of Idumæa, or Edom, and Arabia Petræa, to the ſouth. The next remarkable diviſion, next to the diſtribution, by lot, among the twelve tribes, was made by king Solomon, who divided his kingdom into 12 provinces, or diſtricts, each under a peculiar officer; but the moſt fatal diviſion of all was that which obtained under his imprudent ſon Rehoboam, when ten of the twelve tribes revolted, under the conduct of Jeroboam, who became head of this new monarchy, ſtyled the kingdom of Iſrael, in oppoſition to that of Judah, the title which diſtinguiſhed the maimed kingdom of Rehoboam, from that time downwards. Under the ſecond temple the diſtinction laſted a conſiderable time, and the ſame ſanguinary hatred and hoſtilities continued between theſe two kingdoms; that of Iſrael taking the name of Samaria, from its capital. See SAMARIA.

After the return from the Babylonian captivity, the eaſtern diviſion of the land of Canaan was called Peræa (more properly the country which had belonged to Reuben and Gad, for the northern part, ſometimes called Gaulonitis, was included in the diſtrict of Trachonitis), and the weſtern part was divided into Galilee to the north, Judæa to the ſouth, and Samaria in the middle. See each of theſe articles. Judæa Proper extended from the Dead Sea and the Mediterranean to Egypt, and included the countries of Benjamin, Dan, and Simeon, beſide that of Judah. Under the Romans the land began to be divided into tetrarchies and toparchies: the larger were thoſe of Judæa, Samaria, and Galilee, upper and lower; the leſſer, thoſe of Geraritica, Sarona, and others of leſs note; all which lay on this ſide of the Jordan. The reſt, on the other ſide, were thoſe of Gilead, Peræa, Gaulonitis, Auranitis, Batanea, and Decapolis. Joſephus (Antiq. l. xiv. c. 10.) mentions another diviſion, made in the time of Gabinius, into five diſtricts, or, as he ſtyles them, συνέδρια, or councils, agreeably to the Roman manner; theſe were Jeruſalem, Jericho, and Sephoris, on this ſide of Jordan; and Gadaris and Amathus on the other. The whole country was alſo called Palestine (which ſee), from the Paleſtines or Philiſtines, who inhabited the weſtern coaſts, and were firſt known to the Romans; but it was more commonly called Judæa (which ſee), or Judæa Paleſtina, from Judah, whoſe tribe was the moſt conſiderable of the twelve, and poſſeſſed the fineſt and moſt fertile part of the whole. Chriſtians, as well as Jews, have dignified it with the title of "Holy Land;" partly on account of its metropolis, ſuppoſed to have been the centre of God's worſhip, and his peculiar habitation; but chiefly for its being the native country of Jeſus Chriſt, and the ſcene on which he accompliſhed the great work of our redemption. It has alſo been diſtinguiſhed by other appellations: ſuch as the "Land of Promiſe," the "Land of God," the "Land of Iſrael," and ſometimes, by way of pre-eminence, "the Land." In modern writers, all diſtinction is frequently loſt in the general name of Syria, which is given to the whole country eaſt of the Mediterranean, between the ſea and the deſert. As many of the old inhabitants of the north-weſt of the land of Canaan, particularly on the coaſts of Tyre and Sidon, were not driven out by the children of Iſrael, this tract ſeems to have retained the name of Canaan a long while after thoſe other parts of the country, which were better inhabited by the Iſraelites, had loſt the ſaid name. The Greeks called this tract, inhabited by the old Canaanites, along the Mediterranean ſea, Phœnicia (which ſee); the more inland parts, as being inhabited partly by Canaanites, and partly by Syrians, Syro-Phœnicia; and hence the woman ſaid by St. Matthew (ch. xv. 22.) to be a woman of Canaan, whoſe daughter Jeſus cured, is ſaid by St. Mark (ch. vii. 26.) to be a Syro-Phœnician by nation, as ſhe was a Greek by nation and language. The principal mountains of the land of Canaan or Paleſtine are Libanus or Lebanon, Anti-Libanus, Hermon, Tabor, Carmel, Olivet, Calvary, Moriah, and Gihon, which ſee reſpectively. The moſt noted vallies were the valley of Bleſſing, or Berakhah, in the tribe of Judah, on the weſt ſide of the lake of Sodom, and in the wilderneſs of Tekoah; the vale of Siddim, famed for the overthrow of Chedorlaomer and his confederate kings (Gen. xiv. 2, &c.), and for the cities of Sodom and Gomorrah, now forming the Aſphaltite lake; the valley of Shaveh, or royal valley, where the king of Sodom met victorious Abraham, after the defeat of the confederate kings; the vale of Salt, in which the Edomites were ſubdued by David and Amaziah (2 Sam. viii. 13. 2 Kings, xiv. 7.); the valley of Jezreel, famed for the death of Jezebel, the idolatrous wife of Ahab; the valley of Mamre, famous for the oak under which Abraham dwelt, about 15 miles from Hebron, and 25 from Jeruſalem; the vale of Rephaim, or of the Titans and Giants, near the city of Jeruſalem; the vale of Jehoſhaphat, in or near Jeruſalem; the valley of Hinnom, near the walls of Jeruſalem, notorious for the ſuperſtitious and bloody rites performed there in ancient times; the valley of Zeboim, near the Dead Sea; the valley of Achor, near Jericho; the valley of Bochim, or of the mourners (Judg. ii. 1, &c.), at a ſmall diſtance from Jeruſalem; and the valley of Elah, famous for the defeat and death of Goliath by David, and for the victory which the Iſraelites obtained againſt the Philiſtines (1 Sam. xvii. 2, &c.). The country had alſo ſeveral noted plains, the moſt remarkable of which is that through the midſt of which lay the courſe of the river Jordan, computed to be about 150 miles in length, from the city of Scythopolis northward to the Aſphaltite lake. In this country were alſo ſeveral foreſts, ſuch as thoſe of Hareth, of Ephraim, of Lebanon, in which Solomon had a ſumptuous palace, and of Bethel. The ſeas of Canaan are commonly reckoned five; viz. the Mediterranean, called by the ſacred writers the Great Sea; the Dead Sea or lake of Sodom; the Sea of Tiberias; the Samachonite Sea or lake; and the Sea of Jazer. The moſt conſiderable river is Jordan, which ſee. For a further account of this country and its inhabitants, ſee Canaanites and Palestine.

Canaan, in *Geography*, a thriving townſhip of America, in Lincoln county, and diſtrict of Maine, ſeated on Keanebeck river, about ſeven miles north of Hancock, incorporated in 1788, and containing 454 inhabitants.—Alſo, a townſhip of Grafton county, in New Hampſhire, 10 miles E. of Dartmouth college; incorporated in 1761, and containing, in 1790, 483 inhabitants.—Alſo, a townſhip of Litchfield county, in Connecticut, E. of Houſatonick river, with Maſſachuſetts on the north. It has a forge and ſlitting mill, and furniſhes excellent iron. The mountains a[illegible]ble minerals, particularly lead and iron. It is diſtant 60 miles from New Haven, and 40 N.W. from Hartford.—Alſo, a townſhip of Eſſex county, in Vermont, being the north-eaſtermoſt town in the ſtate.—Alſo, a townſhip of Columbia county, in New York, between Kinderhook on the weſt, and Maſſachuſetts on the eaſt. It has 6692 inhabitants, including 35 ſlaves.

CANAANITES, in *Scripture Hiſtory*, the poſterity of Canaan by his eleven ſons, who are ſuppoſed to have ſettled in the land of Canaan, ſoon after the diſperſion of Babel. Five of theſe are known to have dwelt in the land of Canaan; viz. Heth, Jebus, Hemor, or Amor, Girgaſhi, and Hevi or Hivi; and theſe, together with their father Canaan, became the heads of ſo many nations. Sina or Sini was another ſon of Canaan, whoſe ſettlement is not ſo preciſely aſcertained; but ſome authors infer, from the affinity of the names, that the deſert of Sin, and mount Sinai, were the place of his abode, and that they were ſo called from him. The Hittites inhabited the country about Hebron, as far as Beer-ſheba, and the brook Beſor, reckoned by Moſes the ſouthern limits of Canaan. The Jebuſites dwelt near them on the north, as far as the city of Jebus, ſince called Jeruſalem. The Amorites poſſeſſed the country on the eaſt ſide of Jordan, between the river Arnon on the ſouth-eaſt, and mount Gilead on the north, afterwards the lot of Reuben and Gad. The Girgaſhites lay next above the Amorites, on the eaſt ſide of the ſea of Tiberias, and their land was afterwards poſſeſſed by the half tribe of Manaſſeh. The Hivites dwelt northward, under mount Libanus. The Perizzites, who make one of the ſeven nations of the Canaanites, are ſuppoſed, by Heylin and others, to be the deſcendants of Sina or Sini; and it is probable, ſince we do not read of their abode in cities, that they lived diſperſed, and in tents, like the Scythians, roving on both ſides of the Jordan, on the hills and plains; and that they were called by that name from the Hebrew, *pharatz*, which ſignifies to *diſperſe*. The Canaanites dwelt in the midſt of all, and were ſurrounded by the reſt. This appears from the ſacred writings to have been the reſpective ſituation of thoſe ſeven nations, which are ſaid to have been doomed to deſtruction for their idolatry and wickedneſs, when the Iſraelites firſt invaded their country. The learned have not abſolutely determined whether the nations proceeding from

Canaan's other ſix ſons ſhould be reckoned among the inhabitants of the land of Canaan. The prevalent opinion is, that they were not included. As to the cuſtoms, manners, arts, ſciences, and language of the ſeven nations, that inhabited the land of Canaan, they muſt, from the ſituation they ſeverally occupied, have been very different. Thoſe who inhabited the ſea-coaſt were merchants, and by reaſon of their commerce and wealth ſcattered colonies over almoſt all the iſlands and maritime provinces of the Mediterranean. See Phœnicia. The colonies which Cadmus carried to Thebes in Bœotia, and his brother Cilix into Cilicia, are ſaid to have proceeded from the ſtock of Canaan. Sicily, Sardinia, Malta, Cyprus, Corfu, Majorca, Minorca, Gades, and Ebutris, are ſuppoſed to have been peopled by the Canaanites. (See Bochart's Canaan.) The other Canaanites, whoſe ſituation was inland, were employed partly in paſturage, and partly in tillage, and they were alſo well ſkilled in the exerciſe of arms. Thoſe who dwelt in the walled cities, and who had fixed abodes, cultivated the land; and thoſe who wandered about, as the Perizzites ſeem to have done, grazed cattle, or carried arms: ſo that among the Canaanites, we diſcover the various claſſes of merchants, and, conſequently, mariners; of artificers, ſoldiers, ſhepherds, and huſbandmen. We learn, alſo, from their hiſtory, that they were all ready, however diverſified by their occupations or local intereſts, to join in the common cauſe: that they were well appointed for war, both offenſive and defenſive; that their towns were well fortified; that they were ſufficiently furniſhed with military weapons and warlike chariots; that they were daring, obſtinate, and almoſt invincible; and that they were not deſtitute of craft and policy. Their language, we find, was well underſtood by Abraham, who was an Hebrew, for he converſed readily with them on all occaſions; but as to their mode of writing, whether it was originally their own, or borrowed from the Iſraelites, it is not ſo eaſy to determine. Their religion ſeems to have been preſerved pure till the days of Abraham, who acknowledged Melchiſedek to be prieſt of the moſt high God; and Melchiſedek was, without doubt, a Canaanite, or, at leaſt, dwelt at that time in Canaan, in high eſteem and veneration.

But we learn from the ſcripture hiſtory, that the Hittites in particular were become degenerate in the time of Iſaac and Rebekah; for they could not endure the thoughts of Jacob's marrying one of the daughters of Heth, as Eſau had done. About this time, then, we may date the origin of thoſe abominations which ſubjected them to the divine diſpleaſure, and made them unworthy of the land which they poſſeſſed. In the days of Moſes, they were become incorrigible idolaters; for he commands the Iſraelites "to deſtroy their altars, and break down their images (ſtatues or pillars), and cut down their groves, and burn their graven images with fire." And leſt they ſhould pervert the Iſraelites, the latter were ſtrictly enjoined not to intermarry with them; but "to ſmite them, and utterly deſtroy them, nor ſhew mercy upon them." Deut. vii. 1—5. They are accuſed of the cruel cuſtom of ſacrificing men, and are ſaid to have paſſed their ſeed through fire to Moloch. Levit. xviii. 21. Their morals were as corrupt as their doctrine; adultery, beſtiality of all ſorts, profanation, inceſt, and all manner of uncleanneſs, are the ſins laid to their charge. The Canaanites, ſays Mr. Bryant, (Anal. Anc. Mythol. vol. i. p. 371.) as they were a ſiſter tribe of the Mizraim, reſembled them in their rites and religion. They held a heifer, or cow, in high veneration, agreeably to the cuſtoms of Egypt. Their chief deity was the ſun, whom they worſhipped, together with the Baalim, under the titles of Ourchol, Adonis, or Thamuz. The Canaanites, at Byblus, Berytus, Sidon, and afterwards at Tyre, uſed, in imitation of the Egyptians, mournful dirges for the loſs of Adonis or Thamuz, who was the ſame as Thamas and Oſiris in Egypt; and their meaſures and harmony ſeem to have been very affecting, and to have made a wonderful impreſſion on the minds of their audience. This infectious mode of worſhip prevailed to ſuch a degree, that the children of Iſrael were forbidden to weep, and make lamentation upon a feſtival. See Nehem. viii. 9. 11. Joſeph. Antiq. l. xi. c. 5. p. 563. Among the Canaanites, this manifeſtation of ſorrow was encouraged, and made part of their rites.

As to the government of the Canaanites, they ſeem to have been comprehended in a great number of ſtates, under ſubjection to limited chiefs, or kings, as they are called; and tranſacted all their buſineſs in popular aſſemblies.

When the meaſure of the idolatries and abominations of the Canaanites was compleated, God delivered their country into the hands of the Iſraelites, who conquered it under Joſhua. However, they reſiſted with obſtinate valour, and kept Joſhua employed ſix years, from the time of his paſſing the river Jordan, and entering Canaan, in the year B. C. 1451, to the year B.C. 1445, the ſabbatical year beginning from the autumnal equinox; when he made a diviſion of the land among the tribes of Iſrael, and reſted from his conqueſts. As God had commanded this people, long before, to be treated with rigour (See Deut. vii. 2.), Joſhua extirpated great numbers, and obliged the reſt to fly, ſome into Africa, and others into Greece. Procopius ſays, they firſt retreated into Egypt, but advanced into Africa, where they built many cities, and ſpread themſelves over thoſe vaſt regions, which reach to the ſtraits, preſerving their old language, with little alteration. In the time of Athanaſius, the Africans ſtill ſaid they were deſcended from the Canaanites; and when aſked their origin, they anſwered, "Canani." It is agreed, that the Punic tongue was nearly the ſame as the Canaanitiſh or Hebrew.

After the Canaanites had been ſucceſſively defeated, and, at length, diſperſed and reduced, the Anakims, a fierce and barbarous race, who inhabited ſome of the mountains of the land, of a diſtinct origin from the Canaanites, were invaded and cut off; and thus, by degrees, the Iſraelites became maſters of the greateſt part of the land of Canaan. However, the Canaanites of ſeveral denominations were ſtrong and powerful, and retained no mean ſhare of the country; and, for 19 or 20 years, the remainder of Joſhua's days, they were very little moleſted. At length, when the diviſion was completely ſettled, the Canaanites were, on all ſides, invaded again by the tribes of Iſrael, who wiſhed to drive them out of their reſpective lots. However, in the conflicts thus occaſioned, the contending parties ſeem to have been pretty equally matched; ſo that although multitudes of the Canaanites were ſlain in the wars with Joſhua, and many of them fled in queſt of more quiet habitations, yet, after all their calamities, they appear to have been little inferior to the Iſraelites; nor do we find that any one tribe of them was miſſing, except the Girgaſhites, who, it is ſaid, fled into Africa, and ſettled in that country. Thus it appears, that ſome of the more immediately devoted nations, viz. the Canaanites, Hittites, Amorites, Hivites, and Jebuſites, were allowed to dwell in common with the children of Iſrael in their promiſed land. See Judges, ch. i. ii. For this exerciſe of mercy and toleration reaſons of a political and religious nature have been aſſigned. Thus the Iſraelites were prevented from ſinking into a ſluggiſh and inactive ſtate, as they had enemies to excite and exerciſe their courage, and to to keep up among them martial diſcipline; they were thus preſerved in a condition of immediate dependance on God, and directed to look conſtantly to him for ſuccour; and it was thus provided, that no part of the country, which was too extenſive to be every where inhabited by the Iſraelites at their firſt ſettlement, ſhould be left deſolate, ſo as to become a refuge for wild beaſts, which, by their increaſe, might prove a more dreadful and pernicious enemy than the Canaanites. Beſides, it has been very juſtly alleged, that though the order for extermination was poſitive and abſolute, the promiſe of power to fulfil it was limited and conditional. It was not till after the Iſraelites had forſaken the Lord, and worſhipped other gods, that the Lord would no more enable them to expel the Canaanites. The Canaanites ſeem to have been able to have maintained their ground in ſeveral parts of the country, and particularly in Jeruſalem, till the reign of David; when that city, which had been held by the Jebuſites, was taken by ſtorm. They were alſo invaded in Gezer by Pharaoh; their city was burnt, and they were all put to the ſword. Thus oppreſſed by the Iſraelites on one hand, and by the mighty power of Egypt on the other, the remaining Amorites, Hittites, Perizzites, Hivites, and Jebuſites, were reduced, in the reign of Solomon, to a ſtate of ſlavery, and employed in the labour of carrying on his vaſt and ſumptuous works; and this ſeverity was entailed on their poſterity. 1 Kings, ix. 20, 21. Ezra, ii. 55. 58. Nehem. xi. 3. Although upon their firſt reduction, they became proſelytes to the Jewiſh religion, yet it has been thought, that they were diſtinguiſhed from the Jews, and reckoned of a more ignoble blood, born to drudgery. Among the tribes of the Canaanites above enumerated, who became ſubject to the yoke of Solomon, the Canaanites, peculiarly ſo called, are omitted. Theſe, we may therefore conclude, bore no part of the burden impoſed upon the others; but remained free and independent in their poſſeſſions on the ſea-coaſt, roſe afterwards to great celebrity, and, continually improving themſelves in navigation, commerce, and the uſeful arts, were compriſed under the appellation of Phœnicians. Anc. Un. Hiſt. vol. i.

The deſtruction of the Canaanites, and the expulſion of them from their country by a divine order, whilſt ſome of them were allowed to remain in oppoſition to this order, have afforded a theme, on which ſceptics and infidels have vehemently declaimed; and which they have urged as an unanſwerable objection either to the truth of the ſcripture hiſtory, or, admitting the fact, to the moral providence of God. This objection has been lately ſtated in its full force by a learned commentator and critic (Dr. Geddes) in the preface to the 2d volume of his "Tranſlation," and alſo in the 1ſt volume of his "Critical Remarks," p. 422, &c.; and inſtead of obviating it by argument, or admitting the ſufficiency of the ſolution of the difficulty, propoſed by other ingenious and learned writers, he boldly cuts the Gordian knot, reſpecting the order ſuppoſed to be given by God for the extermination of the Canaanites; deeming this method preferable to the unſucceſsful endeavours of other ſcriptural writers to untie it. Inſtead of acceding to any of the arguments which have been employed in defence, or even in extenuation, of this ſuppoſed cruel and ſanguinary meaſure, he denies that any ſuch order proceeded from God, or even from the mouth of Moſes. He ſuſpects it to be "the fabrication of ſome poſterior Jew, to juſtify the cruelties of his nation." Of courſe, he diſputes the abſolute and univerſal inſpiration of the Hebrew writers. It is beſide our purpoſe to enter at large into the diſcuſſion of this ſubject. But when we conſider, that the extermination of the Canaanites forms a leading and prominent part of the ſcripture hiſtory, and that it is, more directly or indirectly, referred to as the conſequence of a divine order, in a great variety of paſſages, the idea of the fabrication of ſuch an order by a poſterior Jew, ſeems to us to be altogether inadmiſſible. The account of this event, and of the circumſtances ſucceeding and attending it, pervades the whole Jewiſh hiſtory; and if we ſuppoſe that the providence of God had no concern in the conduct and execution of it, we muſt be led to admit a great number of fabrications and interpolations in the detailed account which the ſcripture has given us of it, and we ſhall ultimately undermine the truth of the hiſtory itſelf, and find it difficult to determine what part of it is authentic and true and what is forged and falſe. But we are of opinion, that the objection itſelf, which has been repeated by Tindal, Morgan, and Bolingbroke, and laſt of all by the author of the "Age of Reaſon," has been as often ſatisfactorily refuted. To this purpoſe it has been argued, that the Canaanites were guilty not only of the groſſeſt idolatries, but of the moſt execrable vices, ſome of which have been thought to deſerve death, and have been ſo puniſhed in all civilized countries. God expreſsly declares, after warning the Iſraelites againſt theſe abominable crimes, that becauſe of theſe things "he abhorred thoſe nations and caſt them out." Lev. xx. 23. It is plain then, that the wickedneſs of the Canaanites was the true cauſe of the puniſhment that was inflicted upon them; and accordingly it is given as a reaſon why they were not long before expelled and deſtroyed, that the "iniquities of the Amorites was not yet full." Gen. xv. 16. It was not, therefore, till the meaſure of their ſins was compleated, and their wickedneſs became univerſal and incorrigible, that the threatened judgment was inflicted. Now can it be denied, that God, who is the ſovereign arbiter of life, and who may, and actually does, whenever he pleaſes, take away men's lives without injuſtice, may in juſt judgment cut ſhort the lives of perſons for their crimes, and bring general deſtruction even upon communities of people or nations? Why, it may be aſked, ſhould the deſtruction of a ſmall part of the inhabitants of the earth be pronounced to be incompatible with the divine attributes, while the deſtruction of the whole world by the deluge is paſſed by without any comment? The general deſtruction of the human race in the latter caſe, and the partial extermination of the Canaanties, are to be accounted for upon preciſely the ſame principle. In both caſes it was the enormous wickedneſs of the people which drew upon them ſuch ſignal puniſhment. This kind of puniſhment of individual or national wickedneſs may ſerve the purpoſe of inſtructive example and warning to the world in general; and in the caſe before us it was highly expedient, and even neceſſary for the inſtruction of that age of mankind, that the Supreme Ruler ſhould make a ſignal and ſtriking example of a nation ſo far ſunk in idolatry and corruptions of all kinds, as all the inhabitants of Canaan are ſaid to have been. With reſpect to the mode of the puniſhment of the Canaanites, it may be obſerved, that if God had deſtroyed them by famine or by peſtilence, if he had cauſed fire from heaven to conſume them, or exterminated them by an inundation or an earthquake, none could have preſumed to arraign the wiſdom and juſtice of his proceedings; although in calamities of this public nature infants muſt have ſuffered as well as the parents; and among the adults ſome innocent individuals muſt have been involved in the common ruin. In ſuch a caſe it could not have been ſaid, that this was contrary to the law of nature, or that it was not conformable to the uſual conduct of Providence. But then it would not have been ſo apparent, that this calamity of their extermination was inflicted by way of puniſhment for their idolatry and deteſtable wickedneſs. It might poſſibly have been attributed to ſome natural cauſe, or have been regarded as an unaccountable and fortuitous event. But when they were ordered to be exterminated for their abominable crimes by an expreſs command of God, atteſted by a ſeries of the moſt amazing miracles and divine interpoſitions; and this was appointed to be executed by another nation, peculiarly ſet apart by their original conſtitution to the acknowledgment and worſhip of the one true God, and of him only, and to whom God had given the moſt excellent and holy laws, threatening them at the ſame time with ſimilar puniſhments if they committed the like crimes:—in this caſe, the reaſon of the judgment was as apparent as when a malefactor is put to death by an officer of juſtice for a crime, in execution of the ſentence of a juſt magiſtrate. Nor in ſuch a procedure is there any thing, that can be proved to be inconſiſtent with the wiſdom and righteouſneſs of the Supreme Being, or contradictory to his own laws; ſince there is no law of nature that debars God from executing judgments on particular perſons, or guilty nations, for their crimes and vices, even to extermination; or from employing, if he thinks fit, one or more nations to execute his judgments upon others. In this inſtance the word of God is in perfect harmony with his works and thoſe manifeſtations of the divine attributes that are diſcernible in the book of nature.

Although God cannot diſpenſe with the abſolute and immutable obligations of doing whatever is juſt and right; yet a command from God may either make or imply ſome change in the circumſtances and relations of things, on which the moral fitneſs of the human conduct depends, and conſequently it may be fit and right to do that in virtue of a divine command, which it would not have been fit to do without it.

Lord Bolingbroke, indeed, (vol. iii. p. 305. vol. v. p. 148.) has compared the invaſion of Canaan by the Iſraelites, and what they did there, to the cruelties exerciſed by the Spaniards in America, and to the ravages of the Huns under Attila, who, he ſays, were much more merciful than they; but he ſeems to forget the difference between theſe caſes; viz. that the latter had no motive or pretence, but their own ambition, avarice, and cruelty; whereas the former acted in execution of the expreſs command of God, and by a commiſſion from him, the truth of which was confirmed by a ſeries of the moſt extraordinary divine atteſtations that the world ever ſaw. This can, therefore, furniſh no precedent for any other nation to do the like, except they can produce the ſame or equal proofs of a divine commiſſion. The ſame general anſwer will ſuffice for obviating ſeveral of the inferences deduced from this event by Dr. Geddes, *ubi ſupra*. It would be a ſufficient reaſon for the extermination of the Canaanites by the ſword of the children of Iſrael, if, as is very poſſible, this was the beſt method of impreſſing the minds of the Iſraelites themſelves with a juſt idea of the heinous nature of idolatry, and to make ſufficient proviſion againſt their being ſeduced into the ſame abominable practices. If their living only in the neighbourhood of idolatrous nations was ſo unſafe for this people, as their hiſtory ſhews it to have been, what danger would they not have been in, if they had ſpared the old inhabitants of Canaan, and ſuffered them to live unmoleſted among them? It ought alſo to be conſidered, that in all the other wars in which the Iſraelites might happen to be engaged, with their neighbouring nations, they were expreſsly enjoined to purſue different and more humane maxims, ſparing all except ſuch as were found bearing arms. In this particular caſe only they were expreſsly commanded to "exterminate utterly." That the Iſraelites were not influenced by the uſual paſſions of conquerors, but acted under an authority which controuled their natural deſires, is manifeſt from their ſparing even the cattle, and even refraining to appropriate to themſelves the treaſure which they found in Jericho, which was the firſt fruits of their conqueſts, and to be devoted to God. The Iſraelites have often been compared to barbarous conquerors and cruel murderers; but let other conquerors and aſſaſſins be produced, who refrained from plunder as they did. That they were not actuated by mere rage and revenge is evident from their having received no particular provocation, not indeed having had any perſonal intercourſe with the inhabitants of Canaan. Their motives muſt, therefore, have been very different from thoſe of common robbers and murderers; and in the judgment of reaſon, it is the motive that determines the nature of the action. It is alſo remarkable, that notwithſtanding the paſſion which the Iſraelites may be ſuppoſed to have had for war, which would have been inflamed by the rapidity of their conqueſts, they were forbidden to extend them beyond the boundaries of the land of Canaan; and the conſtitution of their government was altogether unſuited to extenſive empire.

The learned Mr. Bryant in his Treatiſe on the authenticity of the Scriptures, (p. 245, &c.) argues againſt the objection which we have been conſidering, that the Canaanites were uſurpers, and had acted in direct defiance of an ordinance of God, by ſeizing upon the land appropriated from the beginning to the children of Iſrael. Moſes, accordingly, intimates, that the land of Canaan was their peculiar inheritance, Deut. xxxii. 7, 8. In the Euſebian Chronicle of Scaliger it is mentioned, that Canaan the ſon of Ham, firſt made an innovation in the world. "He treſpaſſed upon the rights of his brethren, and ſeized upon the land, which had been appropriated to God's future people." When the Iſraelites, therefore, were brought to Canaan, they came to their own inheritance, and thoſe who uſurped their property knew it, and knew by whom it had been appointed.

After all, we may obſerve, that the order to exterminate utterly in the caſe of the Canaanites, though expreſſed in *abſolute* terms, is ſuppoſed by ſome to have been *conditional* in fact; and that their lives were to have been ſpared upon their ſubmiſſion, and eſpecially upon their forſaking idolatry. Accordingly, it is plain in fact, that the Iſraelites either did not underſtand the command to be abſolute, or they knowingly tranſgreſſed it, even in the beſt and moſt flouriſhing ſtate of their affairs. To this purpoſe we have already remarked, that many of the Canaanites lived in ſubjection to the Iſraelites even to the times of their kings (1 Kings ix. 20, 21.); nor do we ever read that they were blamed for the favour they ſhewed them. Moreover, the reaſon and end for which the order for the extermination of the Canaanites was given, viz. leſt the children of Iſrael ſhould be enticed by them into idolatry, entirely ceaſed upon their ſubmiſſion, and abandoning their idol worſhip, which was generally the caſe. Beſides, it is pretty clearly inferred, that this order was conditional, from the circumſtance, that if the hearts of the Canaanites had not been hardened to oppoſe the Iſraelites, they would not have been cut off. Joſh. xi. 19, 20. Accordingly it has been alleged, that the ſeverity of the judgments inflicted upon the Canaanites for their extreme wickedneſs, of which the Iſraelites were the inſtruments, was not executed in the degree or to the extent which has been ſuppoſed. This has been maintained with great ſtrength of argument by learned and impartial judges; by Maimonides and others of the firſt account among the Jews, and alſo by many Chriſtians of our own and other countries. Grotius, in particular, on Deut. xx. 10. maintains, that the law, Exod. xxiii. 31, 32. and Deut. vii. 1, 2, was to be extended only to ſuch of theſe people as did not ſurrender themſelves on being ſummoned; as is evident from Joſhua xi. 19, 20. We ſhall further add, that idolatry, under the Jewiſh theocracy, was a crime of peculiar malignity: and therefore, although God has not thought fit to enact a general law obligatory on all mankind for puniſhing idolaters with death, and without his appointment it might not be executed; yet when it pleaſed him for wiſe ends to ſelect a particular nation, and among them to erect a peculiar ſacred polity, and to appoint that the worſhip of the one true God and of him only ſhould be the very baſis of their conſtitution, on which all their privileges, their national property, and their right to their country depended, it is evident, that under ſuch a conſtitution to revolt to idolatry and polytheiſm was in the moſt criminal ſenſe to be traitors to the community: and of courſe to arraign a law for inflicting a capital puniſhment upon idolaters under that particular conſtitution is highly abſurd. Nor ſhould it be forgotten, that the idolatry of the ancient Gentile world, and eſpecially that of the inhabitants of Canaan, was by no means a ſyſtem of merely ſpeculative *opinions;* but a courſe of the moſt atrocious and abominable *practices*, enjoining the cruel murder of numberleſs innocent children, as well as other human victims, and the moſt ſhocking lewdneſs, together with other vices of the moſt deteſtable nature. And ſurely it becomes a wiſe legiſlator and the moral Sovereign of the univerſe to reſtrain, by the moſt authoritative and awful ſanctions annexed to his laws, the commiſſion of ſuch deſtructive vices as theſe.

Mr. Wakefield, in his "Reply to the Second Part of the Age of Reaſon," by Thomas Paine, ſuggeſts, that ſome qualifications and ſoftenings in the caſe of many relations and occurrences in the ſcripture hiſtory, may be properly admitted, without any danger to the main fabric of revelation, upon the ground of exaggeration from national vanity, and the pride of individuals. Hence, he ſays, we may preſume upon enlargement in the part of the narrative on the ſplendour of their victories, the number of the ſlain, and the extent of their deſolations. He further intimates, that the Jewiſh hiſtorians had been accuſtomed to ſpeak of every tranſaction as preſcribed by the expreſs injunctions of Jehovah, when we are under no neceſſity, as he conceives, of ſuppoſing a ſpecific and actual interference in the caſe, but may very rationally, and in conformity to the rules of accepted interpretation, have recourſe for a ſolution to that predominant and univerſal perſuaſion, from their infancy, of the peculiar ſuperintendance of Jehovah, not only over the political welfare of their ſtate, but the private concerns of individuals. He adds, that it is a point worthy of inveſtigation how far Joſhua, and his fellow ſoldiers, in conformity to the ferocious character of the times, and the ſanguinary propenſities of military men, may actually have exceeded their commiſſion, and indulged themſelves in unauthorized acts of murder, rapine, and devaſtation. Having collected a variety of opinions on this intereſting ſubject, we muſt refer for a further diſcuſſion of it to the authors already cited, and to the following publications: Leland's Anſwer to Chriſtianity as old as the Creation, vol. ii. p. 429, &c. Leland's Deiſtical Writers, vol. ii. p. 446, &c. Prieſtley's Inſtitutes, vol. ii. p. 22, and Prieſtley's Notes on all the Books of Scripture, vol. i. Preface, Sermons, &c. by Joſeph Nicol Scot. vol. i. Lindſey's Converſations on the Divine Government, p. 80—85. Biſhop of Lincoln's Elements of Chriſtian Theology, vol. i. p. 70, &c.

CANACA, in *Ancient Geography*, a town of Spain, placed by Ptolemy in the country of the Turdetani.

CANACE, in *Entomology*, an Indian ſpecies of PAPILIO, deſcribed by Linnæus, the wings of which are angulated and blue, with a pale band; beneath yellow, and green marbled. Amœn. Acad.

CANADA, ſometimes called the *Province of Quebec*, in *Geography*, a country of North America belonging to Great Britain, bounded on the north by Hudſon's bay, Eaſt Main and Labrador, on the eaſt by Labrador, the bay of St. Lawrence, and New Brunſwick, on the ſouth by the United States, and on the weſt by Lake Winnipeg and parts of America hitherto imperfectly deſcribed. It is computed to extend from the gulf of St. Lawrence and iſle of Anticoſti in the eaſt, to the lake of Winnipeg in the weſt, or from 64° to 97° W. long. 33 degrees, or about 2000 geographical miles, the breadth from the lake of Erie in the ſouth, or N. lat. 43°, may extend at leaſt to N. lat. 49°, comprehending 6 degrees, or 360 geographical miles. Others make its extent much more conſiderable towards the north, and eſtimate it at 500 miles. Its mean breadth is not above 200. It is now divided into two provinces, called Upper and Lower Canada; the former, which has been commonly denominated the Upper country, lies north of the Great Lakes, and is ſeparated from New York by the river St. Lawrence, here called the Cataraqui, and the lakes Ontario, and Erie. Its capital is Newark, or Niagara, on the Britiſh ſide of the Niagara; beſide which it has Kingſton, inhabited by emigrants from the United States, and reckoned by ſome the chief town. The latter lies on both ſides of the river St. Lawrence, and has for its capital Quebec, the chief city of the whole country. Upper and Lower Canada are ſeparated by the river Utawas, or more preciſely by a line, which commences at a ſtone boundary on the north bank of lake St. Francis in the river St. Lawrence at the cove, W. of Point-au-Boudet, and runs thence northerly to Utawas river, and to its ſource in lake Tomiſcaning, and thence due north till it ſtrikes the boundary of Hudſon bay, or New Britain. Upper Canada includes all the territory to the weſtward and ſouthward of the ſaid line, to the utmoſt extent of the country known by the name of Canada. The original population of this country conſiſted of ſeveral ſavage tribes, and it is ſaid to have been firſt diſcovered in 1497 by John and Sebaſtian Cabot. The French were the firſt Europeans who took poſſeſſion of it, and made their ſettlement at Quebec in 1608. In the year 1759 Quebec was captured by General Wolfe; and Canada was ceded to Great Britain by the treaty of Paris in 1763. From this period till the year 1774 the internal affairs of the province were regulated by the ordinance of the governor alone. In purſuance of the Quebec bill, which was then paſſed, a legiſlative council was appointed by his majeſty, and the number of its members was limited to twenty-three. But by an act paſſed by the Britiſh parliament in 1791, the executive power in each province was veſted in the governor; and a legiſlative council, and an aſſembly, were appointed for each of the provinces of Upper and Lower Canada, having power to make laws with the conſent of the governor; but the king may declare his diſſent at any time within two years after the bills are received, in which caſe they become void. The legiſlative council of Lower Canada conſiſts of 15 members; that of Upper Canada of ſeven. They are ſummoned by the governor under the king's authority, and appointed for life, unleſs they forfeit their office by an abſence of four years, or by ſwearing allegiance to any foreign power. The aſſembly of Lower Canada conſiſts of 50 members, and that of Upper Canada of 16; and they are choſen by the freeholders in the towns and diſtricts. The aſſembly is not to continue longer than four years, but it may be diſſolved ſooner; and the governor is bound to convene it at leaſt once in each year. The governor, together with ſuch of the executive council, as ſhall be appointed by the king for the affairs of each province, are to be a court of civil juriſdiction for hearing and determining appeals; ſubject, however, to ſuch appeals from their ſentence as heretofore exiſted. All lands in Upper Canada are to be granted hereafter in free and common ſocage; and alſo in Lower Canada, when the grantee ſhall deſire it, ſubject, nevertheleſs, to alterations by an act of the legiſlature; and the preſent ſyſtem of judicature in each province was eſtabliſhed by the Quebec bill of 1774. But whilſt the French laws were ſuffered by the Quebec bill to exiſt, in order to conciliate the affections of the French inhabitants, who were attached to them, although the abolition of theſe laws would be favourable to the intereſts of civil liberty; the criminal law of England was happily eſtabliſhed through every party of the country. The whole of Britiſh America, Canada included, is ſuperintended by an officer ſtyled governor-general of the four Britiſh provinces in North America, who, beſides other powers which he poſſeſſes, is commander in chief of all the Britiſh troops in the four provinces, and the governments attached to them, and Newfoundland. Each of the provinces has a lieutenant-governor, who, in the abſence of the governor-general, is inveſted with all the powers requiſite to a chief magiſtrate.

By an act paſſed in the 18th year of his preſent majeſty's reign, the Britiſh parliament has the power of making any regulations, that may be found expedient, reſpecting the commerce and navigation of the province, and alſo of impoſing import and export duties, reſtricted to the uſe of the province, and applied in ſuch a manner as the laws made in the council and aſſembly direct.

Every form of religion is completely tolerated in both provinces; but the Roman catholic religion is that of a great majority of the inhabitants; and by the Quebec bill of 1774, eccleſiaſtics of that perſuaſion are legally empowered to recover all the dues, which, before that period, they were accuſtomed to receive, as well as tithes, from the Roman catholic inhabitants; nevertheleſs, they cannot exact any dues or tithes from Proteſtants, or from lands held by Proteſtants; although ſuch lands might formerly have been ſubjected to dues and tithes for the ſupport of the Roman catholic church. Theſe dues and tithes are, however, ſtill to be paid to perſons appointed by the governor and reſerved in the hands of his majeſty's receiver-general, for the ſupport of the Proteſtant clergy actually reſiding in the province. By the act of the year 1791 it was alſo ordained, that the governor ſhould allot out of all lands belonging to the crown, granted after that period, one-ſeventh for the benefit of the Proteſtant clergy, to be ſolely applicable to their uſe; and it is required that all ſuch allotments ſhould be particularly ſpecified in every grant of waſte-lands; otherwiſe the grant is void. The governor, with the advice of the executive council, is authoriſed to conſtitute parſonages or rectories, and to endow them out of theſe appropriations, and to preſent incumbents to them, ordained according to the rites of the church of England. The clergy of this church, in both provinces, conſiſt at preſent only of 12 perſons, including the biſhop of Quebec; whereas thoſe of the church of Rome amount to 120, viz. a biſhop, three vicars-general, and 116 curates and miſſionaries, all of whom are reſident in the lower province, except five curates and miſſionaries. The number of the diſſenting clergy, in both provinces, is conſiderably ſmaller than that of the clergy of the church of England. The population of Upper Canada has been ſtated by ſome to amount to 40,000, by others to 20,000 Britiſh and French inhabitants, excluſive of 10,000 loyaliſts, who are ſettled in the upper parts of the province. Lower Canada, according to a cenſus, ordered to be taken by general Haldimand in 1784, contained 113,012 inhabitants. Both provinces may probably now contain more than 150,000 perſons; and their number is multiplying both by a natural increaſe and by emigrants from other countries. The number of ſavages has been eſtimated at 50,000. About nine-tenths of the inhabitants of theſe provinces are Roman catholics; and about five-ſixths of thoſe of Lower Canada are ſuppoſed to be of French extraction. Some of the lower claſſes of the French Canadians poſſeſs all the gaiety and vivacity of the people of France; but others have, to appearance, a great deal of that ſullenneſs and bluntneſs in their manners which is characteriſtic of the people of the United States: vanity, however, is the predominant feature in the character of all of them. Few of the men can read or write, and in this reſpect are much inferior to the women; but both men and women are ſunk in ignorance and ſuperſtition, and blindly devoted to their prieſts. The French language is univerſally uſed; Engliſh being reſtricted to the few Britiſh ſettlers. The houſes in Lower Canada are in general well furniſhed with beds, in the French ſtyle, very large, and raiſed four or five feet high. The houſes are for the moſt part built of logs; but they are much more compact and better conſtructed than thoſe of the United States; the logs being fitted more cloſely together, planed and white-waſhed externally, and generally lined with deal boards within. However, the inattention of the inhabitants to the admiſſion of air, by occaſionally opening their windows, renders them very diſagreeable and even unwholeſome. The expences of the civil liſt in this province are eſtimated at 20,000l. *per annum*, one-half of which is defrayed by Great Britain, and the other moiety by the province, out of the duties paid on the importation of certain articles, ſuch as ſpirits, wine, ſugar, molaſſes, coffee, tobacco, ſalt, and playing cards. The expence of the civil-liſt in Upper Canada is eſtimated at about a fourth of that of the lower province. The military eſtabliſhment in both provinces, together with the repairs of fortifications, &c. is computed to coſt Great Britain 100,000l. annually; and the like ſum is chargeable for preſents to the Indians, and ſalaries to officers employed among them in trade, &c. in Upper Canada. Theſe expences, however, are thought to be counterbalanced by the advantages of the commerce with this country, which is ſaid to employ about 7000 tons of ſhipping annually. The imports into Canada conſiſt of earthen-ware, hard-ware, and houſehold furniture, various articles of woollen, linen, and cotton, haberdaſhery, hoſiery, &c. ſtationary, leather, and its manufactures, grocery, wines, ſpirits, Weſt Indian produce, &c. &c. cordage of every deſcription, and the coarſe manufactures of iron. Some domeſtic manufactures of linen and of coarſe woollen cloths are carried on in moſt parts of Canada; but the greater part of theſe articles is ſupplied by Great Britain. The exports from Canada conſiſt of wheat, flour, biſcuit, timber, ſtaves, and lumber of various kinds, dried fiſh, oil, ginſeng, and various medicinal drugs, but principally of furs and peltries. The eaſtern part of Lower Canada, between Quebec and the gulf of St. Lawrence, is mountainous; and a few ſcattered mountains alſo occur between Quebec and the mouth of the river Utawas; but higher up the river St. Lawrence the face of the country is flat. The ſoil conſiſts principally of a looſe dark-coloured earth, 10 or 12 inches deep, lying on a bed of cold clay. This thin mould, however, is very fertile, and yields plentiful crops, although it is worked every year by the French Canadians, without being ever manured. The manure chiefly uſed, ſince the practice of manuring has been introduced, by thoſe who are the beſt farmers, is marle, which is found in great quantities in many places along the ſhores of the river St. Lawrence. The ſoil of Lower Canada is peculiarly adapted to the growth of ſmall grain. Tobacco alſo thrives well in it, but the culture is neglected, except for private uſe; and more than half of what is uſed is imported. The ſnuff produced from the Canadian tobacco is held in great eſtimation. Culinary vegetables arrive at great perfection in Canada, which is alſo the caſe with moſt of the European fruits. The currants, gooſeberries, and raſpberries are very fine: the latter are indigenous, and are found very abundantly in the woods. A kind of vine is alſo indigenous; but the grapes produced by it in its uncultivated ſtate are very poor and ſour, and not much larger than fine currants. In the foreſt there is a great variety of trees; ſuch as beech, oak, elm, aſh, pine, ſycamore, cheſnut, and walnut; and the ſugar maple-tree is found in almoſt every part of the country. Of this tree there are two kinds; the one called the ſwamp maple, being generally found on low lands, and the other, the mountain or curled maple, from its growing upon high dry ground, and from the grain of its wood being beautifully variegated with little ſtripes and curls. The former yields more ſap than the latter, but its ſap affords leſs ſugar. A pound of ſugar is frequently procured from two or three gallons of the ſap of the curled maple, whereas no more than the ſame quantity can be had from ſix or ſeven gallons of that of the ſwamp tree. The maple ſugar is the only ſort of raw ſugar uſed in the country parts of Canada, and it is alſo very generally uſed in the towns. See SUGAR.

The air of Lower Canada is very pure, and the climate uncommonly ſalubrious, except in the weſtern parts of the province, high up the river St. Lawrence. From Montreal downwards the climate very much reſembles that of the ſtates of New England. This difference of ſalubrity in the two parts of the province is aſcribed by Mr. Weld to the different aſpects of the country; to the eaſt, Lower Canada, like New England, is mountainous, but to the weſt it is an extended flat. According to his account, the extremes of heat and cold are amazing; Fahrenheit's thermometer, in the months of July and Auguſt, riſing to 96°, and yet in winter the mercury generally freezes. The tranſitions from heat to cold are leſs ſudden, and of courſe leſs injurious to the conſtitution in Canada than in the United States; and the ſeaſons are much more regular. The ſnow begins to fall in November; which is the moſt unpleaſant, cold, and gloomy part of the year: but in December the clouds are generally diſſolved, the froſt ſets in, and the ſky aſſumes a bright hue, continuing for weeks without a ſingle cloud. The greateſt degree of cold occurs in January, and it is ſometimes ſo intenſe, as to endanger a perſon, who is expoſed to it, being froſt-bitten; but the coldeſt days have intervals of warm weather. The winter in Canada is the ſeaſon of general amuſement; and the Canadians tranſport themſelves over the ſnow by means of their carioles and ſledges, each of which holds two perſons and a driver, and is uſually drawn by one horſe, with aſtoniſhing ſpeed as well as great pleaſure. With the ſame horſe, ſays Mr. Weld, it is poſſible to travel 80 miles in a day. The Canadians contrive to guard againſt the cold by ſeveral ſtoves placed in their halls, from which flues paſs to their different apartments, and by double windows and double doors to their houſes. When they go abroad, they cover the whole body with furs, except the eyes and noſe. In May the thaw comes on very ſuddenly, and in its progreſs, the ice in the river St. Lawrence burſts with the noiſe of a cannon, and paſſes towards the ſea with a tremendous rapidity and violence. As ſoon as the winter terminates, the rapid progreſs of vegetation is aſtoniſhing. Spring has ſcarcely appeared before it is ſucceeded by ſummer. In a few days the fields are clothed with the richeſt verdure, and the trees regain their foliage. The grain ſown in grain time in May affords a rich harveſt by the latter end of July. At this ſeaſon of the year, however, Fahrenheit's thermometer ſeldom riſes above 84°; in July and Auguſt it ſometimes riſes to 96°. The fall of the year is a moſt agreeable ſeaſon in Canada, as well as the ſummer. It is obſerved, that there is in general a difference of about three weeks in the length of the winter at Montreal and at Quebec; and of courſe in the other ſeaſons. When green peas, ſtrawberries, &c. were entirely gone at Montreal, they were in full ſeaſon at Quebec.

Mr. Weld, to whom we are indebted for a great part of this article, (ſee his Travels, vol. i.) has pointed out ſome inconveniences attending the tenures of land in Canada, which ought to be removed; more eſpecially as in ſuch a climate there is no occaſion for a barrier againſt colonization. The botany of Canada differs little from that of the United States; and the chief ſingularities in the zoology are the mooſe, the beaver, and ſome other animals deſcribed by Mr. Pennant in his arctic zoology. The reindeer appears in the northern parts, and the puma and lynx are not unknown. Both the Canadas are much infeſted with rattle-ſnakes. The humming bird is not uncommon at Quebec. The mineralogy is of little importance; and though iron ores have been diſcovered in various parts of the country, works for the ſmelting and manufacturing of it have been erected only at one place, in the neighbourhood of Trois Rivieres. The works are now the property of the Britiſh government. The bank of ore that ſupplies them is nearly exhauſted. We learn from Kalm (vol. ii. 349.) that there are lead mines which yield ſome ſilver; and it is probable that copper may be found, as it appears in the ſouth-weſt of Lake Superior. Coal has not yet been diſcovered in Canada. The country ſtill remains to be examined, and it is highly probable that important diſcoveries might be made. Its chief natural curioſities ſeem to be its rivers, lakes, and cataracts.

One of the moſt remarkable accidents which hiſtory records of this country, provided that it were ſatisfactorily aſcertained, is the earthquake of the year 1663, which is ſaid to have overwhelmed a chain of mountains of free-ſtone more than 300 miles long, and changed the immenſe tract into a plain. We ſhall enumerate and deſcribe the principal towns, lakes, rivers, and cataracts of this country in their proper places.

CANADA, *bay of*, lies on the eaſt ſide of the iſland of Newfoundland, between White and Hare bays, which laſt lies north of it.

CANADA *creeks* are three creeks of North America: one a water of Wood creek, which it meets four or five miles N. N.W. of Fort Stanwix, or New Fort Schuyler. The other two are northern branches of Mohawk river; the upper of which mingles its waters with the Mohawk in the townſhip of Herkemer, on the German flats, 16 miles below Old Fort Schuyler, and is croſſed by an ingeniouſly conſtructed bridge; the other empties into the Mohawk 13 miles below. Both theſe creeks are long, rapid, and unnavigable ſtreams, and ſupply the Mohawk with a conſiderable acceſſion of water. The lands adjoining them are rich and valuable, and furniſh inviting ſettlements.

CANADA, *ſea of*, or ſea of Huron, a name which might be given to the large inland ſea, that is formed by the lakes

Superior, Michigan, and Huron, and which is about 350 miles in length, and more than 100 at its greateſt breadth. See each of theſe articles.

Canada *Saga lake.* See Seneka *lake.*

CANADENSIS, in *Ornithology*, a ſpecies of Tetrao, that inhabits Hudſon's bay. The tail feathers are black, and at the tip tawny, and near the eyes are two white ſtripes. Gmel. This is ſuppoſed by late authors to be the male bird of the Linnæan Tetrao Canace, which is deſcribed as having the tail entire, with a white ſpot behind the ears and noſtrils. Syſt. Nat. edit. 12.

Canadensis, a ſpecies of Ardea, or Heron of the bald kind, diſtinguiſhed by the name of the brown crane of Canada among Engliſh authors. The forehead is naked and papillous; body cinereous; wings teſtaceous on the outſide. Gmel. Obſ. This is the brown and aſh-coloured crane of Edwards, *La Grue brune* of Buffon, and *La Grue de la Baye d'Hudſon* of Briſſon.

The length of this bird is three feet three inches. Bill three inches and three quarters long, of a duſky colour, with the tip of the upper mandible pale fleſh colour. The top of the head is covered with a red ſkin thinly beſet with hairs; cheeks and throat whitiſh; head and neck cinereous; upper part of the back, ſcapulars, and wing-coverts pale rufous margined with brown; breaſt, belly, thighs, and ſides aſh-coloured; tail deep aſh; legs and bare part of the thighs black. This bird is peculiar to America. It ſubſiſts on corn, and Indian maize occaſionally. Among the natives of North America it is known by the title of Samak-uchechauk.

CANAJOHARY, in *Geography*, a poſt-town of North America in Montgomery county, New York, ſeated on the ſouth ſide of Mohawk river, and comprehending a large diſtrict of fine country; 40 miles W. of Schenectady, and 56 miles from Albany. In the ſtate cenſus of 1796, 730 of the inhabitants appear to be electors. A creek of the ſame name enters the Mohawk in this town. This was the principal ſeat of the Mohawk Indians, and abounds with apple-trees of their planting, from which is made excellent cyder.

CANAKAMPALEAM, a town of Hindooſtan, in the Myſore country; 12 miles E. of Sattiemungulum.

CANAL, *Canalis*, in general, denotes a long, round, hollow inſtrument, through which a fluid matter may be conveyed.

In which ſenſe, it amounts to the ſame with what we otherwiſe call a pipe, tube, channel, &c. Thus the *canal* of an aqueduct, is the part through which the water paſſes; which, in the ancient edifices of this kind, is lined with a coat of maſtic of a peculiar compoſition.

Canal, a duct or pipe (as its derivation from the Latin *Canæ*, a cane, or reed, ſeems to imply), in which ſenſe it is uſed by anatomiſts in deſcribing the paſſage through which ſome of the animal fluids paſs: the term Canal has alſo been applied to denote any piece of water, eſpecially if of a conſiderable length in proportion to its width, and eſpecially ſuch as are ſtagnant, or have not the fall and natural motion which rivers have. Canals may be either for pleaſure or ornament, ſuch as are common in the vicinity of palaces and great houſes; or applied to the purpoſes of inland navigation. The artificial carriages for conveying ſtreams of water for the ſupply of cities or other purpoſes, as was done by the famous aqueducts of antiquity, and in modern times by the new rivers near London, and others, have ſometimes alſo been called Canals.

The importance and utility of canals have been ſo long and ſo generally acknowledged, that it is hardly neceſſary to introduce the ſubject with any obſervations to this purpoſe. Few perſons have more attentively conſidered or better underſtood the political and commercial intereſts of nations than the late Dr. Smith; and no one could be a more zealous advocate for the extenſion of inland navigation, as an effectual means of improving the country, in which it is encouraged. To this purpoſe he obſerves, in his "Wealth of Nations" (vol. i. p. 229.), that good roads, canals, and navigable rivers, by diminiſhing the expence of carriage, put the remote parts of the country more nearly upon a level with thoſe in the neighbourhood of large towns; and on that account they are the greateſt of all improvements. They encourage the cultivation of the remote parts, which muſt always be the moſt extenſive circle of the country. They are advantageous to towns, by breaking down the monopoly of the country in its neighbourhood; and they are advantageous to all parts of the country; for though they introduce ſome rival commodities into the old markets, they open many new markets to its produce. "It is not more than 50 years ago," ſays he in 1776, when the firſt edition of his work was printed, "that ſome of the countries in the neighbourhood of London, petitioned the parliament againſt the extenſion of the turnpike roads into the remoter counties. Thoſe remoter counties, they pretended, from the cheapneſs of labour, would be able to ſell their graſs and corn cheaper in the London market than themſelves, and would thereby reduce their rents, and ruin their cultivation. Their rents, however, have riſen, and their cultivation has been improved ſince that time." "All canals," ſays an intelligent writer on this ſubject (See Phillips's General Hiſtory of Inland Navigation, Introd.), "may be conſidered as ſo many roads of a certain kind, on which one horſe will draw as much as 30 horſes on ordinary turnpike roads, or on which one man alone will tranſport as many goods as three men; and 18 horſes uſually do on common roads. The public would be great gainers were they to lay out upon the making of every mile of a canal twenty times as much as they expend upon a mile of turnpike road; but a mile of canal is often made at a leſs expence than the mile of turnpike: conſequently there is a great inducement to multiply the number of canals."

The advantages reſulting from canals, as they open an eaſy and cheap communication between diſtant parts of a country, will be ultimately experienced by perſons of various deſcriptions: and more eſpecially by the manufacturer, the occupier or owner of land, and the merchant. The manufacturer will thus be enabled to collect his materials, his fuel, and the means of ſubſiſtence, from remote diſtricts, with leſs labour and expence; and to convey his goods to a profitable market. As canals multiply, old manufactures revive and flouriſh, new ones are eſtabliſhed, and the adjoining country is rendered populous and productive. To the occupier of land, canals are uſeful in a variety of ways. In ſome caſes, they ſerve the purpoſes of draining and of irrigation; in others, they furniſh manure at a cheap rate; and they facilitate the conveyance of the produce to places where it may be diſpoſed of to the greateſt advantage. The landowner muſt of courſe be benefited, by the increaſing value and advanced rent of his eſtate, in conſequence of the improvement it receives from the induſtry of the occupier, excited and encouraged by an immediate recompence. The wholeſale trader and merchant are likewiſe enabled to extend their commerce by means of canals; as they can thus export greater quantities and varieties of goods from places remote from the ſea, and eaſily ſupply a wider extent of inland country with the commodities that are imported from foreign nations. Nor are they merely the means of extending and increaſing foreign commerce, but they ſerve alſo to create and augment an internal trade, which, with all the advantages attendant on foreign commerce, may probably far exceed it in extent, value, and importance. We might add, that an inland communication between parts of a country, at a great diſtance from one another, contribute to the ſecurity, as well as to the extenſion of commerce, in the boiſterous months of winter, and in times of war, when the navigation of the ſeas would be attended with danger. "Were we to make the ſuppoſition of two ſtates," ſays Mr. Phillips (ubi ſuprà), "the one having all its cities, towns, and villages upon navigable rivers and canals that have an eaſy communication with each other; the other poſſeſſing the common conveyance of land-carriage; and ſuppoſing, at the ſame time, both ſtates to be equal as to ſoil, climate, and induſtry; commodities and manufactures, in the former ſtate, might be exported 30 *per cent.* cheaper than in the latter; or, in other words, the firſt ſtate would be a third richer and more affluent than the ſecond." Should it be objected, that navigable canals waſte or occupy too great a portion of land in the countries through which they paſs, the objection may be obviated by the conſideration, that one mile of a canal, 14 yards wide, takes up little more than five acres of land.

If we advert to fact, and conſult the records of hiſtory with regard to the ſtate of different nations, we ſhall find, that civilization and commerce have very much depended on the facility with which the inhabitants of remote diſtricts have maintained intercourſe with one another, as well as with diſtant countries. As the ocean ſerves to connect diſtant countries, navigable rivers and canals unite the different provinces and diſtricts of the ſame country; and as navigation, by means of the ocean, produces an intercourſe and mutual exchange of productions between different kingdoms, inland navigation, in like manner, facilitates a communication between different parts of the ſame kingdom, and conſequently promotes trade and induſtry. In North America, the plantations have conſtantly followed either the ſea-coaſt or the banks of the navigable rivers, and have ſcarcely any where extended themſelves to any conſiderable diſtance from the one or the other. The nations that appear to have been firſt civilized, were thoſe that dwelt round the coaſt of the Mediterranean ſea, which, from a variety of circumſtances, was extremely favourable to the early navigation of the world. Of all the countries on the coaſt of the Mediterranean, Egypt ſeems to have been the firſt, in which either agriculture or manufactures were cultivated and improved to any conſiderable degree. Upper Egypt extends itſelf nowhere above a few miles from the Nile, and in Lower Egypt that great river breaks itſelf into many different canals, which, aided by a ſmall degree of art, ſeem to have afforded a communication by water-carriage, not only between all the large towns, but between all the conſiderable villages, and even to many farm-houſes in the country; nearly in the ſame manner as the Rhine and the Maeſe do in Holland at preſent. The extent or facility of this inland navigation was probably one of the principal cauſes of the early improvement of Egypt. The improvement in agriculture and manufactures ſeems likewiſe to have been of very great antiquity in the provinces of Bengal in the Eaſt Indies, and in ſome of the eaſtern provinces of China. In Bengal, the Ganges and ſeveral other large rivers form a great number of navigable canals, in the ſame manner as the Nile does in Egypt. The caſe is the ſame in the eaſtern provinces of China, where ſeveral large rivers form, by their different branches, a multitude of canals, and by communicating with one another afford an inland navigation much more extenſive than that either of the Nile or the Ganges, or perhaps of both of them united. It is remarkable, however, that neither the ancient Egyptians, nor the Indians, nor the Chineſe, encouraged foreign commerce; but they all ſeem to have derived their extraordinary opulence from this inland navigation. On the other hand, thoſe nations that have been deſtitute of the means of inland navigation, either by rivers or canals, have remained from one age to the other in the ſame barbarous and uncivilized ſtate. This obſervation is exemplified in the ſtate of all the inland parts of Africa, and of that part of Aſia which lies at any conſiderable diſtance north of the Euxine and Caſpian ſea, the ancient Scythia, and the modern Tartary and Siberia. The commerce that may be carried on by means of a river, which does not break itſelf into any great number of branches or canals, and which runs into another territory before it reaches the ſea, can never be very conſiderable; becauſe it is always in the power of the nation who poſſeſſes that other territory to obſtruct the communication between the upper country and the ſea. Thus the navigation of the Danube is of very little uſe to the different ſtates of Bavaria, Auſtria, and Hungary, in compariſon of what it would be if any of them poſſeſſed the whole of its courſe till it falls into the Black Sea. To theſe general obſervations, we ſhall ſubjoin a brief account of the principal canals that have been formed among the nations of antiquity, and among foreign nations in later times; reſerving the principal part of this article for an enumeration of the canals of our own country, and for an illuſtration of the principles on which they are conſtructed, the regulations to which they are ſubject, and the various uſes to which they are applied.

In the hiſtory of ancient nations we diſcover various traces of canals, formed for military, agricultural, commercial, or other purpoſes. The "foſſiones Philiſtinæ" of Pliny (l. iii. c. 16.), which were large canals at the mouth of the Eridanus in Liguria, are aſcribed by Mr. Bryant to the Canaanites, and particularly to the Caphtorim, who at a remote period migrated from Philiſtim; and hence theſe outlets of the river were named "Philiſtinæ." We learn from Herodotus (l. i. c. 174.) that the Cnidians, a people of Caria in Aſia Minor, formed a deſign of digging a channel through the iſthmus which joined their territory to the continent; but they relinquiſhed the undertaking, becauſe they were interdicted by an oracle. Strabo informs us (l. ix. p. 406, &c.). that canals and pits were dug in Bœotia, at a very remote period of antiquity, for drawing off the water of the lake Copais, which would otherwiſe have overflowed the whole country. This lake near the ſea terminates in three bays, which advance to the foot of mount Ptous, ſituate between the ſea and the lake. From the bottom of each of theſe bays numerous canals were made to diverge and traverſe the mountain through its whole breadth, ſome of which were more than a league in length, and others of a much greater extent. For the purpoſe of excavating or of cleanſing them, very deep wells had been ſunk at ſtated diſtances on the mountain. The labour of forming and the expence of maintaining theſe canals muſt have been immenſe. They have ſince been almoſt wholly neglected, ſo that moſt of them are choaked up, and the lake ſeems to be gaining on the plain. The inhabitants of Babylonia or Chaldæa guarded againſt the detrimental inundations of the Tigris and Euphrates by a great number of artificial rivers and canals, which ſerved to diſtribute the waters, to benefit the country in general, and to effect an eaſy communication and intercourſe between the occupiers of different parts of the country. The Euphrates, according to Ptolemy (l. v. c. 17.), above Babylon, near a town in Meſopotamia, called Sipphara, divides itſelf into two branches, one running to Babylon, and the other to Seleucia, where it falls into the Tigris. The latter, ſays Pliny (l. vi. c. 26.), was partly artificial; and he places Seleucia at the confluence of the Tigris and Euphrates, adding that the Euphrates was conveyed to it by a canal. Prideaux, (Conn. b. ii. part i. p. 103.) on his authority, ſuppoſes that branch to have been artificial, and aſcribes it to Nebuchadnezzar. Between theſe two branches an artificial canal was cut from the Euphrates, above Babylon, to the Tigris at Apamea, 60 miles below Seleucia. This canal, which was large and navigable, was called *Naarmalcha*, which ſee. From the Naarmalcha the emperors Trajan and Severus, in their wars with the Parthians, dug a new canal to the Tigris, near Coche on the weſt, and Cteſiphon on the eaſt ſide of that river. At the diſtance of 800 furlongs from Babylon, to the ſouth was another canal, called by Arrian (Exped. Alex. l. vii.) Pallacopas, and by Appian (Bell. Civil. l. ii.) Pallacotta, derived from the branch of the Euphrates that paſſed through Babylon and conveyed water to certain lakes or marſhes in Chaldæa. On this canal, or river, as Arrian calls it, Alexander ſailed from the Euphrates to theſe lakes. Strabo (l. xvi.) deſcribes the courſe of this canal, without naming it. But it is impoſſible to trace out, with accuracy, theſe and the other numerous branches and canals which watered the ancient country of *Babylon*, which ſee. Many of thoſe that were formerly conſiderable are now loſt; and others have been formed ſince, that did not exiſt in ancient times; for a country ſo much watered, ſo low in ſituation, and ſo ſubject to the violence of extraordinary inundations from the two large rivers, the Tigris and Euphrates, and ſo neglected as it has been for ſeveral ages, muſt have often and very conſiderably changed its face ſince the time of Ptolemy; and it is almoſt impoſſible to deſcribe it ſuch as it was while it continued to be the ſeat of empire, when the inhabitants were rich enough to take care of its numerous banks, and to keep them in repair. See BABYLONIA.

Both the Greeks and Romans propoſed to make a canal acroſs the iſthmus of Corinth, which joins the Morea and Achaia, and thus to make a navigable paſſage by the Ionian ſea into the Archipelago. Demetrius Poliorcetes, Julius Cæſar, Nero, and Caligula renewed the attempt, but without ſucceſs. Plin. l. iv. c. 4. After the death of Alexander the Great, Seleucus Nicanor attempted to make a canal between the Euxine and Caſpian ſeas, but his undertaking proved abortive. Travellers, however, aſſert that traces of very deep vallies are to be ſeen, through which the canal is ſaid to have paſſed. Selim II. and Peter the Great, renewed the attempt, but they were prevented from ſucceeding, not ſo much by the impracticability of the ſcheme as by other collateral circumſtances. The Romans, more intent on conqueſts than on commerce and the arts, afford us few inſtances of canals for internal navigation. We find, however, that Druſus, under the emperor Auguſtus, having conceived the deſign of marching into Germany without haraſſing his troops by a long and difficult march, facilitated the execution of it by making a canal that communicates from the Rhine with the Iſſel, extending from the village of Iſeloort to Doeſbourg. This canal received a great part of the waters of the right branch of the Rhine, which became by that means much leſs conſiderable. At the ſame time he opened a third mouth from that river into the ſea, mentioned by Pliny under the name of "Flevum Oſtium." But the face of the country has been much altered from that time. Lucius Verus who commanded the Roman army in Gaul under Nero, attempted to make a canal between the Moſelle and the Rhine. Corbulo under Claudius employed his ſoldiers in digging a canal between the Rhine and the Maeſe, through an interval of about 23 miles, in order to preſerve the country from inundations, and to ſerve as a drain, in caſe of any extraordinary overflowings of the ſea. Cluverius and Cellarius ſuppoſe this to be the canal that begins at Leyden, paſſes by Delft, continues on to Maeſland, and joins the Maeſe at the village of Sluys. Claudius alſo employed 30,000 men for about 11 years in digging a canal through a mountain for draining the lake Fucinus (now Celano) into the river Liris; and in 1789 this canal was begun to be cleanſed to the great relief of the neighbouring country, which was inundated by its obſtruction. The Romans, during their reſidence in this country, made a canal between the Nyne, a little below Peterborough, and the Witham, 3 miles below Lincoln, called by the modern inhabitants "Caerdike," which is now almoſt wholly filled up. It was almoſt 40 miles long, and, as far as we may judge from the ruins, very broad and deep. Some have ſuppoſed it to be a Daniſh work. J. Morton ſuppoſes it to have been made under the emperor Domitian. Urns and medals have been diſcovered on the banks of this canal, which ſeem to confirm that opinion. Morton's Hiſt. Northamptonſhire, ch. 10. Charlemagne, at a later period, formed a deſign of joining the Rhine and the Danube, and of thus making a communication between the ocean and the Black ſea, by a canal extending from the river Almutz, which diſcharges itſelf into the Danube, to the Reditz, which falls into the Maine; and the Maine joins the Rhine near Mayence. In the execution of this deſign he employed a great number of workmen, but he was prevented from completing it by a variety of obſtructions which occurred. Of all the countries to which ancient hiſtory directs our attention, Egypt was the moſt diſtinguiſhed by its numerous canals, which, according to Savary, amounted to 80, ſeveral of which are 20, 30, and 40 leagues in length. Theſe ſerved to receive and diſtribute the waters of the Nile, at the time of its inundation. Moſt of theſe are neglected, and, conſequently, one-half of Egypt deprived of the means of its cultivation. The canals which convey the water to Cairo, to the province of Faioum, and to Alexandria, ſeemed to have engaged the chief attention of government. "An officer," ſays baron De Tott (Memoirs, vol. ii. p. 21, &c. Eng. ed.) "is appointed to watch this laſt, and hinder the Arabs of Bachria, who receive the ſuperfluous waters of this canal, from turning them off before Alexandria be provided, or opening it before the time fixed, which would hinder the increaſe of the Nile. That which conveys the waters into Faioum is watched in like manner, and cannot be opened before that of Cairo, which is called the canal of Trajan." But the principal of theſe works was the Grand Canal, by which a communication was made between the Nile and the Red ſea. This was begun, according to Herodotus (lib. ii. p. 181, &c. ed. Weſſelingii.) by Necos, the ſon of Pſammitichus, who deſiſted from the attempt on an anſwer from the oracle, after having loſt 120,000 men in the enterpriſe. Strabo (lib. xvii. p. 1157. ed. Caſaubon.) aſcribes the commencement of it to Seſoſtris, before the Trojan war. It was reſumed and carried on by Darius, ſon of Hyſtaſpes, who relinquiſhed the work on the repreſentation made to him by unſkilful engineers, that the Red ſea being higher than the land of Egypt, would overwhelm and drown the whole country. Diodorus Siculus (lib. i. p. 39. ed. Weſſelingii.) gives the following account of this canal, "A canal of communication has been cut, which paſſes from the gulf of Peluſium to the Red Sea. It was begun by

Necos, the ſon of Pſammitichus, and continued by Darius king of Perſia; but left imperfect in conſequence of the advice of ſome perſons who aſſerted that it would lay Egypt under water, becauſe the land was below the level of the Red ſea. Ptolemy II., however, finiſhed the undertaking, and conſtructed, in the moſt convenient part of the canal, a dam, or ſluice, ingeniouſly contrived, which opened to give paſſage, and immediately cloſed again. Hence the river which diſcharges itſelf into the ſea, near the city of Arſinoe, has received the name of Ptolemy." From this paſſage, ſays baron De Tott, it is plain, that the ſluices ſtill exiſted in the time of Diodorus. The entrance of the canal near Suez yet remains, and might eaſily be rendered navigable, without employing ſluices or locks, as the difference of the level is very ſmall, and without endangering Egypt with inundations. This part of the iſthmus, ſays the baron, affords land very favourable for ſuch an excavation, through the ſmall interval of 12 leagues, which ſeparates the Arabian gulf from the arm of the Nile which approaches it, and afterwards falls into the Mediterranean at Tineh. Strabo adds (ubi ſupra) that this canal was afterwards cleanſed by Trajan. Its width, being 100 cubits, of 22 inches to a cubit, was ſufficient for admitting the paſſage of two galleys abreaſt; and its depth was ſuch as to bear the largeſt veſſels. Pliny, in his account of this canal, (lib. vi. cap. 29.), ſtates its breadth at 100 feet, its depth at 40, and its length to the bitter fountains (near Arſinoe) at 37 miles. By means of this canal, the valuable commodities of India, Perſia, Arabia, and the kingdoms on the coaſt of Africa, which were brought by ſhipping to the Red ſea, were conveyed to the Nile; and thence diſtributed by the Mediterranean not only to Greece and Rome, but to all the ſurrounding nations, until the Portugueſe diſcovered a paſſage to India by the Cape of Good Hope. It did not, however, long ſerve the uſeful purpoſes of commerce, which were at firſt expected. Merchants were diſſatisfied with the delay occaſioned by going to the very bottom of the gulf, and afterwards with the inland navigation of the canal, and that of the Nile, to Alexandria. They found it much more expeditious to unload at Berenice, near the coaſt of the Red ſea (ſee BERENICE): and after three days' journey, to ſend their merchandiſe directly down to Alexandria. Accordingly, this canal was diſuſed, and goods were conveyed from Berenice to the Nile by land; a mode of conveyance occaſionally uſed at this day. Strabo and others have aſſerted, that this canal was again opened about the year 635, by Amru, governor or prefect of Egypt, under the caliph Omar, for the conveyance of the corn of Egypt to Arabia, which was then grievouſly diſtreſſed by a famine. Elmacin, or Al Makin, ſays, that a new canal was opened for this purpoſe, and called by Amru the river of the emperor of the faithful; but it has been more generally ſuppoſed, that he only renewed the ancient canal, the navigation of which, towards the decline of the Roman empire, had been much neglected. The authors of the Modern Univerſal Hiſtory (vol. i. p. 333.), diſcredit the relation of Elmacin and Eutychius; and allege that there never was any paſſage for veſſels dug between the towns of Al Foſtat, on the eaſtern bank of the Nile, and Al Kolzom or Colzum on the Red ſea. The river, or rivulet, denominated by them the river of the emperor of the faithful, ſay theſe authors, was undoubtedly no other than the Amnis Trajanus of Ptolemy, or the Khalig, which annually ſupplies the city of Cairo, as well as the neighbouring country with water. For the preſent ſtate of this canal, ſee CAIRO. They ſuppoſe, therefore, that, on the occaſion now referred to, the caliph Omar ordered Amru to make the Khalig more navigable, by clearing it of the gravel or ſand with which it was then choaked up; and that, for this reaſon, it received the name of the river of the emperor of the faithful. Elmacin farther informs us, that the Alexandrian canal was ſtopped again, at the end next the Red ſea, by the caliph Abu Jaafar, or Almanſor, in the year of the Hegira 150, A.D. 767. Some traces of this canal are ſtill ſubſiſting; and M. Boutier, in 1703, diſcovered that end of it, which riſes out of the moſt eaſterly branch of the Nile. Hiſt. Acad. Sc. for 1703, p. 110, &c.

The canal of Alexandria, cut from the Nile to this city by Ptolemy, during the inundation of the Nile, receives its water at Latf, oppoſite to Fouah, and has three bridges over it, of modern conſtruction. Near the former, by the ſea-ſide, is the entrance of the ſubterraneous aqueduct, that carries a ſupply of water for the Alexandrians into the ciſterns, the arches of which ſupported the whole extent of the ancient city, but they are now incapable of being traced out. The mouth of this aqueduct is now blocked up; but when the water of the canal had arrived to a certain height, in conſequence of the riſe of the river, the principal magiſtrates of the city went in great ceremony to break down the dam. When the ciſterns were full, it was again built up, and the water of the canal continued to fall into the ſea at the old port. It was by this eaſy communication that merchandiſe was formerly conveyed through Egypt. The dangerous paſſage of the mouth of the Nile was thus avoided, as well as the perils of the ſea. But beſide furniſhing the city with water, and facilitating its commerce, this canal, which paſſed along the upper part of the cultivated lands, on the left hand of the Nile, contributed very much to their fertility. In proceſs of time it was ſhamefully neglected. However, it was cleanſed by order of Bonaparte, in his irruption into Egypt, as far as Rhamania. See ALEXANDRIA.

Egypt is interſected in various directions by many other canals. Several of them iſſue from that arm of the Nile which runs to Damietta, and contribute to fertilize the province of Sharkia, which, making part of the iſthmus of Suez, is the moſt conſiderable of Egypt, and the moſt capable of a great increaſe of cultivation. Others run through the Delta, and of theſe, ſays baron De Tott, many are navigable. The canal of Menouf communicates with the two branches of the Nile, 10 leagues below the angular point, called the "Belly of the cow." See MENOUF. The canal of Bahira proceeded from the lake Mareotis, near Alexandria, and having ſent off branches which joined the weſtern branch of the Nile at Eſhlim, Shabur, and Nadir, paſſed on to Upper Egypt. The other principal canals of Egypt will be mentioned in connection with the towns or diſtricts to which they belong.

There is no country on the face of the globe that abounds more with canals and navigable rivers than CHINA: to which article we ſhall refer an account of its inland navigation. Hindooſtan likewiſe furniſhes inſtances at a remote period of the acknowledged importance and utility of canals. As the country between Delhi and the Panjab was ſcantily ſupplied with water, the emperor Feroſe III., who died in 1388, undertook, ſays major Rennell (Memoir, p. 71.), the noble, as well as uſeful, taſk of ſupplying it better, and at the ſame time of applying the water, ſo furniſhed, to the purpoſes of navigation.

The immediate object of the canals, projected and executed by Feroſe, for an account of which we refer to Rennell (ubi ſupra) ſeems to have been the junction of the Setlege and Jumnah rivers, through an interval of 240 geographical miles, and remotely that of the Indus and Ganges. If this grand deſign of Feroſe had been completed, it muſt have ranked with the greateſt works of this kind; "for we ſhould then have ſeen two capital rivers, which traverſe a large part of Southern Aſia, which enter the ſea at the diſtance of 1500 Britiſh miles aſunder, and which ſtretch out their arms, as it were, to meet each other, united by art: and thoſe by nature to a third; ſo as to form an uninterrupted inland navigation from the frontiers of China to thoſe of Perſia." The country of Bengal is ſo interſected in various directions by the natural canals of the Ganges and Burrampooter rivers, together with their numerous branches, as to form the moſt complete and eaſy navigation that can be conceived: and it is ſuppoſed, that this inland navigation furniſhes conſtant employment for 30,000 boatmen, who are employed in conveying by water through the kingdom of Bengal and its dependencies, all the ſalt and a large proportion of the food conſumed by 10,000,000 people, and in tranſporting commercial exports and imports, probably to the amount of 2,000,000*l.* ſterling per annum.

The improvement of inland navigation engaged but little attention in Ruſſia before the reign of Peter the Great. With him, after his return from Holland, where he had obſerved its uſeful effects, the conſtruction of canals became a principal object. Of thoſe projected and haſtily executed by him, we may mention that of Cronſtadt, that of Ladoga, that of Viſhnei-Voloſhok, and that for forming a communication between Moſcow and the Don. For an account of the canal of Cronſtadt, which was left unfiniſhed by czar Peter, ſee Cronstadt. The Ladoga canal was begun in 1718 by his order, and finiſhed during the reign of the empreſs Anne. It was carried out firſt only as far as the Kabona, a rivulet which enters the lake to the eaſt of Schluſſelburgh; but now reaches, without interruption, from the Volkof to the Neva. The length is 67½ miles, and its breadth 70 feet; the mean depth of water in ſummer is ſeven, and in ſpring ten feet; it is ſupplied by the Volkof and eight rivulets. The barks enter through the ſluices of the Volkof, and go out through thoſe of Schluſſelburg. In 1778, four thouſand nine hundred and twenty ſeven veſſels paſſed through this canal. A ſcheme has been projected, and in part executed, for uniting the White Sea and the Baltic, and thus improving the commerce between Archangel and Peterſburgh, by forming a communication between the Ladoga and Beilo-Ozero to the Duna. The canal of Viſhnei-Voloſhok, forms a communication by water between Aſtracan and Peterſburgh, or between the Caſpian and the Baltic. This canal was begun and completed under Peter the Great; but it has been conſiderably improved by the empreſs Catharine, ſo that veſſels reach Peterſburgh in half the time which they formerly employed. In order to form an idea of the courſe of this inland navigation, a map of Ruſſia ſhould be conſulted; and it will be ſeen, that the river Shlina forms the lake Maſtino, which gives riſe to the Maſta; this, after a courſe of 234 miles falls into the lake Ilmen, from which iſſues the Volkof; and this, running 130 miles to the lake Ladoga, ſupplies the Neva; ſo that, in effect, the Shlina, the Maſta, the Volkof, and the Neva, may be conſidered as the ſame river flowing into and through different lakes. By uniting, therefore, the Shlina, which communicates with the Baltic, with the Tvertza, which flows by the Volga into the Caſpian, the canal of Viſhnei-Voloſhok completes the communication between theſe two ſeas. In autumn the navigation from Viſhnei-Voloſhok to Peterſburgh is performed in little more than a month; in ſummer in three weeks. In one year 3485 barks have paſſed through this canal.

The grand project of uniting the Caſpian and the Baltic with the Black Sea, by the junction of the Don and Volga, was planned by Peter the Great. Theſe two rivers approach each other within the diſtance of 40 miles in the province of Aſtracan; and two rivulets, the Hoſla which falls into the Don, and the Camaſhinſka falling into the Volga, are ſeparated only by an interval of five miles. If theſe rivulets could be made navigable, and united by a canal, the Black Sea would be joined with the Caſpian and Baltic. Repeated attempts have been made for this purpoſe, but they have hitherto failed. However, as the Volga and the Don are but 40 miles diſtant, and land carriage in this country is very cheap and eaſy, the advantages reſulting from the projected canal would be ſcarcely equivalent to the expence of forming it. In 1802, a beautiful chart was publiſhed, exhibiting a view of all the canals in Ruſſia, that have been formed between the White and Black Sea, and between the Baltic and the Caſpian. The inland navigation is already carried through ſuch an extent in Ruſſia, that it is poſſible to convey goods by water 4472 miles from the frontiers of China to Peterſburgh, with an interruption only of about 60 miles; and from Aſtracan through a tract of 1434 miles. Cox's Travels in Poland, Ruſſia, &c. vol. iii. Tooke's view of the Ruſſian Empire, vol. i.

The firſt ſovereign of Sweden, who duly appreciated the utility of inland navigation, was Guſtavus Vaſa. Having made Lodeſe (now Gotheborg) a ſtaple-town of trade, he conceived hopes, that in order to prevent the merchant-ſhips bound to Sweden from being obliged to ſail through the Sound, the merchandize might, at ſome future period, be tranſported from thence to Stockholm, by means of the Wenner, Hielmar, and Mæler, when the rivers and lakes uniting with them ſhould be rendered navigable. Eric XIV. deſirous of executing his father's plans, directed a ſurvey to be made of the waters communicating with thoſe lakes, and plans to be formed for joining them by artificial canals. But the turbulence and misfortunes of his reign fruſtrated the accompliſhment of his deſigns. The ſame object was kept in view by ſucceeding ſovereigns. Charles IX. promoted it by the Carlſgraf canal, and Charles XI. by that of Arboga. Guſtavus Adolphus wiſhed to encourage the deſign, but could not find perſons competently qualified to execute it: and Charles XI. was diſcouraged by the report of Dutch engineers, who declared it impracticable. Charles XII. however, approved the propoſal of the celebrated engineer, Polhem, for rendering the cataracts of Trolhætta navigable, and for opening a communication, not only between Gotheborg and Stockholm, but alſo with the Wenner, the Vetter, and Nordkioping, ſufficient for the paſſage of large veſſels. The execution of this plan was immediately begun by his order, and, after his death, revived by Adolphus Frederic. It comprehended three principal parts; viz. the junction of the Mæler and the Hielmar, of the Hielmar and Wenner, and of the Wenner with the German Ocean. The two lakes of the Mæler and Hielmar are united by the Ulviſon, and the canal of Arboga. This canal (ſee Arboga) is, for the moſt part, of ſufficient breadth to receive two barks a-breaſt, and its loweſt depth is eight Swediſh feet. It is chiefly ſupplied with water from the lake Hielmar, which is 80 feet higher than its level; and this fall is broken by eight ſluices. With a view of joining the Hielmar and Wenner, many ſchemes were propoſed, but difficulties occurred which prevented the completion of them. The junction of the Wenner with the German Ocean has been attempted by the Carlſgraf canal, the canal of Trolhætta, and the ſluices of Akerſtræm and Edet. The Carlſgraf canal, ſo called from Charles IX. who commenced it, connects the Wenner with that part of the Gotha, where it is firſt navigable. In 1768 a new ſluice to ſupply the place of that of Polhem, carried away by the water, and of that called Teſſin, found inſufficient, was completed ; and denominated the ſluice of Guſtavus. This ſuperb work is a cut of 400 feet, partly perforated through the ſolid rocks, and conſiſting of two locks, each 200 feet long, and 36 broad ; the ſides being ſtrongly faced with brick and ſtone. The greateſt depth of water is 13, and the loweſt ſix feet. This canal is commonly navigated by veſſels of 80 tons burden. From the end of this canal to the village of Trolhætta, including an interval of five miles, the navigation of the Gotha is uninterrupted ; but when it burſts at once into the cataracts of Trolhætta, called the "gulfs of hell," all farther navigation becomes impracticable through a ſpace of about two miles. Here it is divided into four principal cataracts, ſeparated by whirlpools and eddies, and deſcending through a perpendicular height of 100 feet. Nevertheleſs, an attempt has been made to form a canal through theſe cataracts. The firſt attempt, after much labour and expence, failed ; and another plan was adopted. The length of the canal was to be 4700 feet, its breadth 36, and its depth in ſome parts above 50 ; and it was to conſiſt of nine ſluices ; but the whole of the cut was to be excavated through a bed of red granite ; and though it ſhould not be condemned as impracticable, the difficulties attending it appear to be almoſt inſuperable. After all, it has been doubted, whether the enormous expence attending the execution of it will be compenſated by the advantages reſulting from its completion. Guſtavus III., ſoon after his acceſſion, viſited the works, and ordered all of them to be ſuſpended, except the ſluices of Guſtavus and Aker. But, in order to facilitate the conveyance of merchandiſe from the diſtricts bordering on the Wenner to Gotheborg, a wooden road has been conſtructed on the ſide of the river, from the beginning to the end of the cataracts. About a mile below the cataracts, the courſe of the Gotha is again interrupted by a fall, called Akerſtræm ; and here a canal has been made through a rock, 182 feet long, including the ſluice, 26 deep, and 36 broad. From Akerſtræm the river is clear to Gotheborg, excepting at Edet, where it is intercepted by a bed of rocks. On one ſide of theſe rocks another cut has been made, 600 feet long, 20 deep, and 18 broad. The iron and other merchandiſe are now tranſported acroſs the lake to Wennerſborg, through the Carlſgraf canal, and down the river Gotha to Trolhætta. At the cataracts they are unloaded, carried over the wooden road two miles to the end of the falls, again embarked, and paſſing through the Akerſtræm and Edet ſluices, arrive without further impediment at Gotheborg. Coxe's Travels, vol. iv.

The principal canal of Denmark is that of Kiel. This canal was deſigned to complete the inland navigation, which, for the purpoſe of facilitating the communication between the Baltic and the German Ocean, is formed acroſs the duchy of Holſtein, and it unites with the river Eyder, which paſſes by Rendſburgh, and falls into the German Ocean at Tonningen. It begins about three miles N. of Kiel, at the mouth of the river Lewenſawe, which heretofore ſeparated Holſtein from Sleſwic, and will become a new boundary between theſe two duchies. The diſtance from its beginning to the eaſt ſluice at Rendſburgh is 27 Engliſh miles ; but as the Eyder is navigable about 6¾ miles above Rendſburgh, the cut neceſſary for completing the communication between the two ſeas is only 20½ miles. It was begun in 1777, and was opened in 1785. The perpendicular fall towards the Baltic is 25 feet ſix inches ; that towards the ocean 23 ; and the veſſels will be raiſed or let down by means of ſix ſluices. The breadth of the cut is 100 feet at the top, and 54 at the bottom ; the ſluices are 27 feet broad and 100 feet long, and the loweſt depth of water is 10 feet. Merchantmen of about 120 tons burden will be able to navigate this canal. The utility of this important undertaking is indiſputable. At preſent, even the ſmalleſt veſſels, trading from any part of the Daniſh dominions in the Baltic to the Northern Sea, muſt make a circuit round the extremity of Jutland, and are liable to be detained by contrary winds. This navigation is ſo tedious, that goods ſhipped at Copenhagen for Hamburgh are not unuſually ſent by ſea only to Lubec, and from thence by land. The object, ſays Mr. Coxe, of thoſe who planned this canal, was to draw by Kiel into the Baltic, the commerce of Bremen, Hanover, and Weſtphalia, which is now carried down the Weſer, and by Gluckſtadt upon the Elbe, to Hamburgh and Lubec ; and to facilitate the tranſport of merchandiſe from Holland and the North Sea to the ports of the Baltic. But the difficult navigation of the Eyder between Rendſburgh and Tonningen, occaſioned by numerous ſhoals of ſhifting ſands, will prevent the complete ſucceſs of this canal. Ships ſailing from the Baltic to Engliſh or French ports, will without doubt prefer the navigation round the Cattegate, with all its dangers and difficulties. The trade of Kiel, however, will at all events be greatly increaſed by this canal ; but the principal depoſitory of the merchandiſe will be at Rendſburgh. Coxe's Travels, vol. v.

The canals of Holland and Flanders are innumerable ; and they ſerve the purpoſe of our public roads, ſo that the inhabitants may travel by means of them in their trehſchuyts and barges, and convey commodities for conſumption or exportation, from one part of the country to another, as occaſion requires. An inhabitant of Rotterdam, it is ſaid, may, by means of theſe canals, breakfaſt at Delft or the Hague, dine at Leyden, and ſup at Amſterdam, or return home again before night. By them alſo a prodigious inland trade is carried on between Holland, France, Flanders, and Germany. When the canals are frozen over, they travel on them with ſkaits, and perform long journies in a very ſhort time, while heavy burdens are conveyed in carts and ſledges, which are then as much uſed on the canals as in our ſtreets. The profits which have accrued from theſe canals have been immenſe ; and their amount almoſt exceeds belief. It is ſaid, that they have yielded more than 250,000l. for about 40 miles of inland navigation. The canals of Holland are generally 60 feet wide, and ſix deep, and are kept cleanſed ; the mud, as manure, being very profitable. They are generally level, and need no locks ; and they are commonly elevated above the country for the purpoſe of carrying off the waters, which in winter inundates the land. In the province of Delftland, not more than 60 miles long, 200 wind-mills are employed in ſpring to raiſe the water into the canals. On the dams or banks by which they are bordered, and which are kept in repair at a very conſiderable expence, depends the ſecurity of the country from inundation. The canals of Flanders, ever ſince their trade has declined, and the cities erected on their banks have decayed, have been very much neglected. They indicate, however, the former flouriſhing and proſperous ſtate of the country. So early as the 12th century, large canals were cut ; and they anſwered the purpoſe of inland commerce as well as of draining the land. The ſpacious canal of Bruſſels, begun in 1531, and completed in 1560, extends from this city to the Scheldt, which opens a communication with Holland, and by the canals of Flanders with the ocean. The canals of the other Dutch and Flemiſh towns will be mentioned under their reſpective articles.

France has from a very diſtant period exerciſed its ingenuity and activity in the conſtruction of canals for inland navigation. We muſt content ourſelves with a curſory mention of ſome of the principal. The canal of Briare, called alſo the canal of Burgundy, was begun under Henry IV. and finiſhed in the reign of Louis XIII. It opens a communication between the Loire and the Seine, and then between Paris and the weſtern provinces. Commencing at the Loire near Briare, it paſſes to Montargis, joins the canal of Orleans, which was begun in 1675, and has 20 ſluices, and falls into the Seine near Fontainbleau. It has 42 locks and ſluices; and is of great uſe in inland commerce. The canal of Picardy connects the river Somme with the Oiſe; and beginning at St. Quintin, joins the Oiſe, and affords a ready conveyance to Paris for the grain of Picardy, the ſea-coal, wood, butter, copper, and ſpices from the northern provinces of the kingdom, and from Holland. The moſt conſiderable work of this kind is the canal of Languedoc, called the canal of the two ſeas, which forms a junction between the Ocean and the Mediterranean. It was firſt projected under Francis I., but begun in 1666, and finiſhed in 1681, under Louis XIV., during the miniſtry of Colbert, and by the ſkill of Riquet, the engineer. It eſtabliſhed a ready communication between the two fertile provinces of Guienne and Languedoc, and extends from Cattee in the bay of Languedoc, to the Garonne below Thouloſe, being provided at proper intervals with 114 locks and ſluices. In ſome places it is conveyed by aqueducts over bridges, under which other rivers purſue their courſe. Near the town of Beziers, it was conveyed under a mountain by a tunnel, then thought ſingular and extraordinary, but now common, 720 feet in length and lined with free ſtone. At St. Ferriol it derives a ſupply of water from a reſervoir containing 595 acres. Its breadth is 144 feet, including towing-paths; it is ſix feet deep, and its length 64 French leagues, or about 180 miles. The expence of its conſtruction was about 540,000l., defrayed partly by the king, and partly by the province of Languedoc. On the reduction of the army and navy in 1782, after the concluſion of the American war, the diſbanded ſoldiers and ſeamen were employed in the conſtruction of three navigable canals; viz. one, called the canal of Dehune, extending from Chalon-ſur-Saone to the town of Dijoin on the Loire, through an interval of 21 leagues, and forming a junction with the Saone and the Rhone: a ſecond, called the canal of Burgundy, reaching from St. Jeane-de-l'Aune to the village of Roch, between St. Florentine and Joiſny, through a ſpace of 52 leagues, and opening a communication between the Saone, the Rhine, the Yonne, and the Seine; and a third, called the canal of Neuf-Briſſac, which commences at the village of St. Symphorin, on the Saone, and paſſing the city of Beſançon, is continued below Straſburgh, forming a junction of the Saone with the Rhone, and of the Ill with the Rhine. By theſe canals goods may be conveyed at a cheap rate from Marſeilles, the Mediterranean, Italy, and Switzerland, to the bay of Biſcay and the Ocean, and alſo to Holland and Germany, as well as to Flanders and the Auſtrian Netherlands; and during any future war with England, France will be able to ſupply, by theſe canals, her dock-yards at Marſeilles and Toulon, and alſo her grand arſenal and dock-yards at Breſt and Rochfort, with all ſorts of commodities from the Baltic, without hazarding a voyage by ſea. It would be endleſs to enumerate all the canals, projected or actually executed in France, and forming an eaſy intercourſe between the different diſtricts of this extenſive country. A ſurvey has lately, in 1802, been made of the little river Buzeg or Bureg, with a view of its being brought to Paris in the ſame manner as the New River is brought to London, and of being laid into the ſtreets and houſes by pipes, fire-plugs, and engines, for the purpoſe of cleanſing the ſtreets, as well as accommodating the houſes. Phillips's Inland Navigation, p. 75. 8vo.

Spain has not been altogether inattentive to the improvements likely to reſult from inland navigation. At former periods it has been often propoſed to dig a canal through the iſthmus of Darien, from Panama to Nombre de Dios, and thus to make a ready communication between the Atlantic and the South Seas, and to open a ſtraight paſſage to China and the Eaſt Indies. The project, however, has been conſidered as chimerical, and treated with ridicule. The improvements meditated at home are of much greater importance: but though the inland navigations of Spain have been commenced upon principles both of grandeur and utility, they have been ſuffered to languiſh through the want of reſources, and the tardy meaſures of the court. The great canal of Arragon afforded, in 1785, ſome hopes; but it ſeems to remain in an imperfect ſtate. Two branches, however, are completed: thoſe of Tauſtre, and the imperial canal, both of which begin at Navarre and terminate in the river Ebro, and they have already proved ſources of induſtry to all the diſtricts through which they flow, and rendered the fields fertile. One of theſe canals is conducted over the valley of Riojalon, by an aqueduct 710 fathoms in length, and 17 feet thick at the baſon. Another canal called the canal of Caſtile was projected to begin at Segovia, about 40 miles N. of Madrid, and to extend to the bay of Biſcay, through a diſtance of 140 leagues. This canal is 56 feet wide at the top, 20 feet at the bottom, and nine feet deep, but the completion of it will require many years. The canal of Guadarama was planned in 1784, and being conducted with ſpirit, is probably now completed. It was to commence at the foot of the mountains of Guadarama, near the Eſcurial, and to proceed to join the Tagus, afterwards the Guadiana, and terminate at the Guadalquivir, above Anduxar. Another canal was alſo begun to join the river Manzanares to the Tagus; but the work was ſuſpended. The canal of Murcia was found, after its commencement, to be impracticable. Phillips's Inland Navigation, p. 75, &c.

The Americans poſſeſs a country capable of great and eaſy improvement by internal navigation. To this object they are not inattentive. For an account of their projects and actual progreſs in this buſineſs, we muſt refer to Phillips's Inland Navigation, p. 571, &c., or to the Journals of Mr. Elkanah Watſon.

CANALS, *the Britiſh*; from the great influence which they appear to have had, among other cauſes, during the laſt half century, in promoting the rapid increaſe of our commercial greatneſs as a nation, have induced us to lay before our readers a very full account, not only of the preſent exiſting canals, but of the principles and practice of canal making, in the united kingdoms. As very few of the Engliſh, Welch, Scotch, and Iriſh rivers, are of ſufficient magnitude, and free from ſhoals, to anſwer the purpoſes of navigation far into the country from the ſea, without the aid of art, conducted upon ſimilar principles to thoſe uſed in canal-making; and as nearly all our canals connect with the navigable rivers, and act in ſome meaſure, as extenſions of them further into the country, we have found it expedient to include under this article, whatever we have been able to collect on the ſubject of the *Inland Navigation of the United Kingdom.*

That the navigation of our rivers, by ſhips or ſmaller veſſels has long been an object of conſiderable importance, will appear from *magna charta*, which has made a ſpecial proviſion in the 23d chapter, for the putting down of weirs and other obſtructions in the rivers of England; and from ſtat. 25 Edw. III. c. 4. which ſets forth, that "whereas the common

mon paſſages of boats and ſhips in the great rivers of England, be oftentimes annoyed by inhanſing gores, weres, ſtakes, &c. in great damage of the people: it is eſtabliſhed, the ſame ſhall be cut and utterly pulled down, without being renewed, and that writs be ſent to the ſheriffs to do execution." After two other unſucceſsful attempts by ſtatutes in the ſucceeding reigns, to prevent the free navigation of the rivers from being obſtructed by individuals, intent upon fiſhing, embanking land, or building mills, bridges, or making fords, the ſtatute of the 4th of Henry I. chap. 12, appointed ſpecial commiſſioners for carrying the above ſtatutes into effect; whoſe powers were continued and enforced by two other acts, prior to the 23d of Henry VIII. chap. 5. which being entitled, "The Bill of Sewers with a proviſo," appointed a general commiſſion of ſewers, with large powers that are ſtill in force and acted upon, for making laws and ordinances, and compelling obedience thereto, for the "removing and preventing of impediments and annoyances on rivers, ſtreams, and floods, whereby the paſſage of ſhips and boats might be letted or interrupted." And by the ſtatute of Edward VI. chap. 8, the laſt mentioned and former ſtatutes were confirmed and made perpetual. During the above period, ſeveral other ſtatutes were alſo made, for removing obſtructions in particular rivers, of ſome of which we ſhall have occaſion to ſpeak when we come to mention thoſe rivers.

The general laws of the land proving ſo very ineffectual for protecting internal navigation from the encroachments of individuals and the effects of neglect, this probably ſuggeſted the propriety of thoſe particular grants or ſtatutes which we find enabling corporations, and in ſome inſtances individuals, to take particular rivers under their charge, and to receive tolls or dues from the veſſels navigating within their particular diſtrict. In proceſs of time, as population increaſed, and the advantages of water carriage became more apparent, further grants and acts of parliament were made, authoriſing companies or individuals to extend the navigation on certain rivers further into the country, generally to reach ſome city or great town; theſe acts, ſome of which we ſhall particularize hereafter, generally enabled the parties to deepen, and in ſome inſtances to ſtraiten the courſe of their rivers, to embank them where too wide, to erect jetties and ſluices, to make flaſhes for ſurmounting the ſhallows or rapids, and in later times to erect pound-locks for gaining the aſcent to the different mill-dams upon the river. But the conſtant tendency of rivers, eſpecially rapid ones, to caſt up banks of ſand or gravel in particular places, their deficiency of water in times of drought, and ſuperabundance in times of flood, the ravaging effects of theſe laſt in deſtroying the works erected for the uſe of the navigation; as happened on the river *Avon* between Chriſtchurch and Saliſbury; on the river *Stour*, between the Severn and Stourbridge; on the river *Calder*, between Wakefield and Eſland, and on ſeveral others which might be mentioned; the great labour and difficulty of towing or dragging veſſels againſt the ſtream, eſpecially where there was not a towing-path for horſes, near to the channel of the river, and yet not ſubject to be overflowed and rendered uſeleſs in time of floods; the very lengthened courſe of moſt rivers, ariſing from their ſerpentine, and, in ſome inſtances, varying channel, was not alſo among the ſmalleſt of the difficulties attending them: theſe, at length, ſuggeſted the propriety of leaving the bed of the rivers in ſome inſtances for a new cut for the navigation acroſs a neck of land, with a pound-lock at its lower extremity. As theſe ſide cuts and pound-locks were increaſed in number, to ſhorten the courſe of the rivers, their ſuperior advantages became ſo apparent, that a company of gentlemen and merchants, who had in 1755 obtained an act of parliament authoriſing them to make *Sankey Brook* navigable from the Merſey river to near St. Hellins, in Lancaſhire, with the powers at that time uſual in navigation acts, for the purchaſing of land and other things neceſſary for the intended navigation, at a fair eſtimate to be made by commiſſioners named in the acts; they determined, after mature deliberation, to avoid the bed or channel of the brook altogether, and to make one entire new cut or canal, as near as convenient to the bed of the river, with locks thereon, in ſuch places as the falls of the ground ſhould render neceſſary; and this canal they accordingly effected about the year 1760, ſupplying its higheſt pound or level with water, by a cut or fender from the Brook. Thus navigable canals had their riſe in England; but, a leſs fortunate ſet of gentlemen, who under the power of an act obtained in the year 1730, for making the river *Stroudwater* navigable, from the river Severn to near the town of Stroud, although the act empowered them "to make as many new cuts as they may judge proper, and of what length and breadth they ſhall think convenient;" yet when they had, about the year 1774, determined upon following the example of the *Sankey* proprietors, and in imitation of the duke of *Bridgewater's*, and ſeveral other canals, which had then been executed or were begun; by cutting a canal on the ſide of the Stroudwater river, they were ſtopped by an expenſive law-ſuit, carried on by certain mill and land-owners in the neighbourhood: whereby the diſtinction between the river navigation acts, and canal acts was eſtabliſhed by the Court of Exchequer, before which the caſe came to be argued.

About the year 1757, the *Duke of Bridgewater*, acquainted fully, no doubt, with what had been near 80 years before effected, on the canal of Languedoc, in the South of France, and ſince in different parts of the Continent, conceived the idea of a canal for the purpoſe of conveying coals from his eſtate at Worſley in Lancaſhire, to Salford near Mancheſter. His grace, profiting as no doubt he did, by the works of that great French engineer, *Francis Riquet*, and by the advice of that great natural and ſelf-taught genius *James Brindley*, whom his grace called off, about the year 1758, from his employment as a mill-wright and engine-maker in this country, to perfect, and carry into execution, the great and important ſchemes which he had projected, and for which he propoſed and brought into parliament the firſt act, with powers adequate to the great and extraordinary undertaking, of cutting a canal of ſeveral miles in length, not in the direction of any river or ſtream of water, but croſſing the courſe of ſeveral brooks, roads, &c. and through the lands of a vaſt number of different perſons, all of whom were to be fully compenſated, though deprived of the power of withholding their lands or waters, or in any way obſtructing the deſign. In theſe reſpects, the *Duke of Bridgewater* has not improperly been called the father of canals in England, while his engineer, the late *Mr. Brindley*, by his maſterly performances on the Duke of *Bridgewater's* canal, altered and extended as the ſcheme thereof was, by three ſubſequent acts of parliament, has ſecured to himſelf, and well it ſhould ſeem, from a compariſon of the great features, and minutiæ of execution in this the firſt canal, with moſt others in this country, even of the lateſt conſtruction, long continue to hold, that rank among the Engliſh engineers, to which *M. Riquet* ſeems entitled among foreigners.

The courſe, thus happily opened by the Duke of Bridgewater, was quickly followed by new ſets of adventurers, who were ſeen applying to parliament in almoſt every ſeſſion, for powers to raiſe a joint ſtock on transferrable ſhares, and to make and maintain canals in moſt parts of the kingdom, many of which have been long completed, as our ſubſequent account of them will ſhew, and have contributed in a moſt eminent degree to the improvement of the country, as well as to the enriching of the individuals concerned in a great number of inſtances; in the laudable zeal of adventurers to extend, and of the people of great towns and proprietors of mines and great manufactories to receive, the benefits of inland navigation; numerous ſchemes have been adopted, where from the actual ſcarcity of water, or its previous appropriation to mills, a canal with locks was impracticable. One of the firſt of theſe ſchemes for diſpenſing with locks, was that of *Mr. Bridge*, about the year 1759, upon the *Stroudwater* river before mentioned, where the cargoes of the boats were diſpoſed in a number of boxes or frames, juſt adapted to the ſize of the boats; which boxes of goods were drawn up by cranes to be lodged in other boats on the higher level, and the reverſe in deſcending; which method was afterwards more ſucceſsfully practiſed on *Bridgewater's* canal at Worſley, at Brieley Hill on the *Shropſhire* canal, and other places. The next mode ſeems to have been adopted by *Mr. Davis Drekart*, near the Tyrone collieries on the intended connection with *Blackwater* navigation in Ireland, about the year 1776; and afterwards by *Mr. William Reynolds* on the *Ketley* canal, where the boats were dragged up or let down inclined planes, not very different from the rolling bridges, long before in uſe in Holland and Flanders.

The neceſſity of an expeditious and cheap mode of conveying coals from the pits to the keels or ſhips, had, as early as the year 1680, introduced the uſe of wooden railways, for the waggons to move upon, between the *Tyne* river and ſome of the principal pits, and theſe by degrees became extended to a great number of other coal-works. Since the more general introduction of caſt iron, and its cheaper conveyance by means of canals, iron rails have been ſubſtituted in the place of the wooden ones before mentioned; and the uſe of inclined planes, or parts of the rail-way having a much greater declivity or ſlope than it is practicable to drag carriages up by means of horſes, has become very frequent in parts where the riſe of the ground required it, machinery being on theſe inclined planes adopted to ſupply the place of horſes.

Several years ago, an act of parliament was obtained by *Homfray, Hill, and Co.* for an iron rail-way, or tram-road from *Cardiff* to *Merthyr*, by the ſide of, and as a rival ſcheme of the *Glamorganſhire* canal, for 9 miles or more in length; ſince which, ſeveral other acts have been paſſed for rail-ways, and ſeveral of them executed, to the great benefit of the country, and the companies who conſtructed them; it has alſo become common within the ſame period, to authoriſe canal companies to conſtruct rail-ways, as collateral branches from their canal, to mines or other great works or to large towns within certain diſtances of ſuch canals; by which their benefits have been amazingly extended: moſt of the latter acts have alſo authoriſed the adoption of rail-ways, of inclined planes, or of any of the expedients above-mentioned, or others as ſubſtitutes for locks, in ſuch parts thereof, as are not readily to be ſupplied with water, adequate to the waſte which locks occaſion. So many of theſe compound ſchemes for leſſening the expence of carriage have been already executed, or are in hand, that we have found ourſelves compelled, in order to preſent our readers with a connected and uſeful view of the ſubject, to include what we have to ſay on the ſubject of *rail-ways*, in the preſent article, as well as treat therein of *navigable rivers*, for the reaſons before ſtated.

Great Britain as well as every other iſland, and even a continent taken as a whole, has a range of high land paſſing nearly its whole length, which divides the ſprings and rain waters that fall to the oppoſite coaſts: we ſhall call this range dividing the eaſtern and weſtern rivers of Britain the *grand ridge*, and ſhall in our accounts diſtinguiſh on which ſide, or how each canal is ſituate, in reſpect thereof: and here it will be proper to remark, that no leſs than 22 of our canals now do or are intended to paſs this grand ridge, forming as many navigable connections between the rivers of the eaſt and weſt ſeas! theſe are the *Inverneſs and Fort-William*, *Forth and Clyde*, in Scotland; the *Leeds and Liverpool*, *Rochdale*, *Huddersfield*, *Trent and Merſey*, *Staffordſhire and Worceſterſhire*, *Wyrley and Eſſington*, *Birmingham*, *Dudley*, *Worceſter and Birmingham*, *Stratford*, *Warwick and Birmingham*, *Coventry*, *Grand Junction*, *Oxford*, *Thames and Severn*, *Wilts and Berks*, *Kennet and Avon*, *Dorſet and Somerſet*, *Grand Weſtern*, and *Bude and Launceſton*, in England: and what is not a little remarkable is, that the *Dudley* canal croſſes this grand ridge *twice*, the two ends being on the eaſtern ſide, and the middle part on the weſtern ſide thereof; the Kennet and Avon croſſes the eaſtern and weſtern branches, into which it divides on the Chalk Hills, weſt of Marlborough, by which parts of this canal are in the drainage of the weſt, the ſouth, and the eaſt ſeas! the *Coventry* canal alſo, by means of its Bedworth branch, croſſes the grand ridge twice. The populous and remarkable town of *Birmingham* is ſituate on high ground, near to the grand ridge, and has ſix canals branching off in different directions, either immediately therefrom or at no great diſtance, and what is ſingular, owing to a loop, or ſudden bend of the ridge at this place, no leſs than five of them traverſe the grand ridge, either by means of tunnels or deep-cutting.

When we propoſe to lay before our readers a more full and methodical account than has been given of the Britiſh canals, on which large ſums of money have been expended by individuals, and from which important and laſting benefits have been derived by the inhabitants in their immediate vicinity and by the kingdom at large; it is needleſs to ſtate any formal arguments, in anſwer to the miſtaken objections, which were 40 years ago commonly circulated, whenever a new canal was in contemplation; ſuch as their waſting of land, producing noxious and humid vapours, deſtroying the breed of our draught horſes, leſſening the coaſting trade and the nurſery of ſeamen, injuring old mines and eſtabliſhed works by enabling new ones to be opened, introducing pilfering workmen and boatmen into the country, &c. &c. To the more ſerious objections, ariſing from the cutting of eſtates and fields in two; the taking of water from mills, &c.; interfering with former navigations by canals or rivers, and even with roads, on which, in ſome inſtances, large ſums have been expended, and remain not reimburſed; to theſe and many others, we ſhall have the beſt opportunity of replying, when we come to mention the equitable proviſions which individuals have propoſed, and the legiſlature have in ſo many inſtances enforced, for ſecuring to every one an adequate compenſation for what he is called upon to give up.

General arguments in favour of canals are ſuperſeded by the rapidly improving and thriving ſtate of the ſeveral cities, towns, and villages, and of the agriculture alſo near to moſt of the canals of the kingdom, the immenſe number of mines of coal, iron, limeſtone, &c. and great works of every kind to which they have been conducted, and to which a large portion of them owe their riſe, are their beſt recommendation.

Juſtice requires our acknowledging the aſſiſtance we have received in compiling this account, from the *General Hiſtory of Inland Navigation by John Phillips*, from the three numbers which are publiſhed of *John Cary's Navigable Canals of Great Britain*, from *C. Smith's*, *George Allen's*, and *Laurie and Whittle's* maps of the canals, &c.; from *J. Cary's large map of England, Wales, and part of Scotland*; from *Robert Fulton's Treatiſe on Canal Navigation*, from *William Chapman's Obſervations on Canal Navigation*, from *Joſeph Plymley's Agricultural Report of Shropſhire*, from *Zach. Allnutt's Conſiderations on the Navigation of the Thames*; from *Thomas Badeſlade's*, and from *Nathl. Kinderley's Accounts of the Navigation of Lynn and Wiſbech*, &c. from the *Agricultural* and *Monthly Magazines*, from *Dr. Anderſon's Recreations*, from the *Annual Regiſter*, from *Thomas Telford's Reports on the Caledonian Canal, &c.*; and from the writings of others, to whom we particularly refer.

To *Mr. William Smith*, engineer, of Buckingham-ſtreet, London, we are indebted for many valuable hints and information given on many points, as we are alſo to *Mr. Benjamin Bevan*, engineer, of Leighton Buzard, Beds.

When it is propoſed to form any canal, the choice of a ſkilful and experienced engineer is an object of primary conſideration. Without due attention to this object, many impracticable projects may be adopted, and large ſums of money may be expended without accompliſhing any important and uſeful purpoſe. In ſuggeſting the principal qualifications that are neceſſary for rendering perſons competent to be conſulted or employed in undertakings of this kind, we ſhall merely ſpecify ſome of thoſe that have in an eminent degree diſtinguiſhed, or that ſtill no leſs conſpicuouſly diſtinguiſh ſeveral of our own countrymen. A ſkilful engineer ſhould undoubtedly poſſeſs a conſiderable degree of mathematical knowledge. Calculations, of which ſome are of the moſt abſtruſe and laborious kind, will frequently occur; and he ſhould, therefore, be well acquainted with the principles on which all calculations are founded, and by which they are to be rightly applied in practice. An engineer ſhould alſo have ſtudied the elements of moſt or all of the ſciences, immediately connected with his profeſſion; and he ſhould particularly excel in an acquaintance with the various branches of mechanics, both theoretical and practical. His knowledge ſhould comprehend whatever has been written or done by other engineers, and he ſhould have information in every department of his office from an accurate examination of the moſt conſiderable works that have been executed in all the various circumſtances that are likely to occur. It is neceſſary, that he ſhould be a ready and correct, if not a finiſhed, draughtſman. He ſhould alſo be converſant with the general principles of trade and commerce; with the various operations and improvements in agriculture; with the intereſts and connection of the different owners and occupiers of land, houſes, mills, &c.; and with all the general laws and deciſions of courts, pertaining to the objects connected with his profeſſion. By an extenſive acquaintance with the diſpoſition, inclination, and thickneſs of the various ſtrata of matter, which compoſe the ſoil or land of the Britiſh iſlands, he will be able to avoid many errors incident to thoſe who are deſtitute of this knowledge, and to have the courſe and cauſes of ſprings, to which it leads. As the laſt, though not the leaſt, of theſe qualifications of an engineer, which we ſhall enumerate, we ſhall add, that he ſhould be a man of ſtrict integrity. If, at this day, the affairs of any canal company ſhould be entruſted to perſons deficient in all or the greater part of the qualifications above enumerated, the managers of ſuch a company will thus incur a ſerious reſponſibility to the proprietors and to the public. In this connection we think it right to mention an inſtitution that had its riſe in the year 1771, viz. "the Society of Civil Engineers," as admirably calculated to extend the influence of our preſent and more experienced engineers, and to bring forward to public notice others, who, in the courſe of events, are deſtined to ſecond them. For further particulars relating to this ſociety, we refer to the preface of the firſt volume of Smeaton's Reports, Nicholſon's Journal 4to. vol. ii. and the article SOCIETY of *Civil Engineers*.

A proper engineer being fixed upon, the adventurers ſhould not tie him down too cloſely, by reſtrictions as to time, but allow him leiſure to conſider, digeſt, and reviſe again and again, the different projects and ways, which will naturally in moſt inſtances preſent themſelves to him in an extenſive and thorough inveſtigation. The engineer ſhould be allowed to chuſe and employ the moſt competent aſſiſtants, and to call in and occaſionally to conſult the opinions of eminent or practical men, as land-ſurveyors, agents of the neighbouring landed property, the principal and moſt expert commercial men of the diſtrict, and who are beſt acquainted with its trade and wants, any eminent miners, &c. &c.; and ſuch men the engineer ſhould be authorized liberally, and at once to remunerate for their ſervices and intelligence.

Previous to the beginning of any minute ſurvey or ſyſtem of levelling, the engineer ought to viſit perſonally, and endeavour to make a juſt eſtimate, and preſerve memorandums of all the objects within the diſtrict under conſideration; as of the trade and importance of all the towns likely to be affected by the undertaking, of all mines of coal, iron, &c. quarries of lime-ſtone, free-ſtone, ſlate, &c. or the ſituation where ſuch can be found, of all manufactories of heavy and cumbrous goods, and other extenſive works; and generally of every thing likely to furniſh tonnage for a canal. By this time, if the diſtrict under conſideration be of very conſiderable length, more than one, and perhaps ſeveral, different routes for the propoſed canal have preſented themſelves: and it will be proper, while the engineer's aſſiſtants are carrying levels (uſing good ſpirit levels with teleſcopic ſights) along each, and making rough ſections of the ground, or brook or river along each line, himſelf to viſit and paſs along each of theſe, noting and weighing more particularly the principal difficulties which preſent themſelves in each route, as ſummits or hills to be paſſed, or tunnelled through, vallies to be embanked acroſs, with aqueducts over rivers or brooks, the greater or leſs plentiful ſupply of water, particularly at the ſummit levels, and how far the ſprings and ſtreams of water are at preſent appropriated or eſſential to mills or gentlemen's pleaſurable purpoſes, or to irrigation, or the land occupied by parks, turnpike roads, &c. The advantages of each route ſhould alſo be as carefully noted; as the ſhortneſs of diſtance, connection with great towns, mines and works either on the line or by ſhort and practicable ſide cuts or branches, the ſmalleſt number of locks, bridges, culverts, &c. In weighing all theſe circumſtances, in order to determine on the moſt adviſable line, it ſhould never be loſt ſight of, that a canal is altogether a mercantile ſpeculation, and cheapneſs of conveyance is the grand deſideratum thereof: where, therefore, but few, if any, great towns, works, or mines are found upon a propoſed line, and the principal object is to form a connection between the canals of a diſtrict more fortunately circumſtanced in theſe reſpects, and the metropolis, or a great town, as in the caſe of the *Grand-Junction* canal lately completed, it is evident, that much ought to be done to obtain the ſhorteſt route that is practicable: if, on the contrary, the diſtrict under conſideration has great towns, mines of coal, or great works diſtributed about it, ſome miles in the total diſtance may be properly allowed, and a more circuitous route adopted, to embrace as many as poſſible of theſe objects, particularly coal-works; for it has been remarked, that the carriage of coals gives riſe to the principal revenues of moſt canals; and ſome have even contended, that no canal can anſwer to the proprietors unleſs the carriage of coals be its principal object: there are, doubtleſs, ſome exceptions to this rule. It may be concluded, upon the whole, that no canal can be completed and brought into uſe, but the inhabitants and the agriculture of the diſtrict will ſhortly feel great benefit from it, whatever may be the reſult to the proprietors; yet in the ſtage of the buſineſs of which we are treating, it is the peculiar duty of the engineer to ſtudy the intereſt, and bring forward the probable advantages of the proprietors, fairly and without exaggeration, in order that the ſubſcription may fill, and the work be enabled to proceed. Before determining upon the route of a canal, its connection with the neighbouring canals or river-navigations ſhould be well conſidered, and the engineer ſhould inform himſelf accurately of the quantum of benefit or injury likely to reſult to each of ſuch exiſting navigations by the effecting of the new one, or how far their rivalſhip, or that of any other ſcheme which may at the time be in agitation, is likely to effect the one he is employed upon; in all the practicable routes, which preſent themſelves for the new canal.

The moſt eligible route for the canal being ſettled in the engineer's mind, he will then proceed to make a rough calculation of the quantity of goods of each different kind, which may be expected to paſs upon the line in a given time; he will alſo examine all the canals and rivers which the propoſed canal is to connect with, and aſcertain the widths and depths thereof, the ſizes of their locks, and of the veſſels uſually navigating them. The engineer will now be able, well conſidering the nature of the ground the canal is to paſs over, to determine on the moſt proper dimenſions for the intended canal, and whether the probable ſupply of water renders it practicable to effect the riſes and falls by the ordinary mode of locks; or whether inclined planes, or any other of the expedients which we ſhall more particularly enumerate hereafter, ſhould be adopted: or even, whether a rail-way, in whole or in part, may not be preferable to a canal. The mind of the engineer will properly be exerciſed upon theſe queſtions, before a more minute and expenſive ſurvey and planning of any particular line are entered upon; becauſe, the line, though paſſing through the ſame tract of country, will generally require to be conducted in a very different place for great lengths together, according to the ſize of the propoſed canal; and inclined planes, or a rail-way in whole or in part, will introduce a ſtill greater diverſity in the routes that ought, under the different circumſtances, to be purſued.

*Robert Fulton*, in his 4to. Treatiſe on Canal Navigation, publiſhed at London in 1796; *William Chapman*, in his 4to. Obſervations on the various Syſtems of Canal Navigation, London, 1797; *Thomas Telford*, in J. Plymley's 8vo. General View of the Agriculture of Shropſhire, London, 1803; *Edmund Leach*, *Dr. James Anderſon*, and others in different works, have recommended and enforced, upon principles more or leſs general and true in their application, a variety of ſchemes and methods of conveyance, by ſmall canals, inclined planes, rail-ways, &c. of which we ſhall take notice under their proper heads, and of which the engineer will of courſe avail himſelf, as far as they appear applicable; as well as of any other inventions, which his own ingenuity or that of others may ſupply. Long levels may, in ſome inſtances, be obtained, without inordinate expence; and will often prove of great utility, in the ſaving of the time and trouble of paſſing locks in the neighbourhood of great towns, as in the caſes of Coventry, which has the benefit of more than 73 miles of level navigation on the *Coventry*, *Aſhby de la Zouch*, and *Oxford* canals; and of Mancheſter, which has [illegible] miles of level water by *Bridgewater's*, and *Merſey and I*[illegible] canals, including 12 miles in the tunnel to the *duke of Bridgewater's* coal-works in Worſley Hill: Birmingham has 4[illegible] miles of ſtill water, by means of the old *Birmingham*, the *Worceſter and Birmingham*, the *Dudley* and the *Stratford* canals; and this upon ſo high a level, that the three laſt canals croſs the grand ridge in that ſpace: Lancaſter and Preſton have 42½ miles of level on the *Lancaſter* canal; Wolverhampton enjoys the benefit of a level 40 miles in length, on the old *Birmingham*, and *Wyrley and Eſſington* canals; Liverpool has 28 miles of level on the *Leeds and Liverpool*, and Blackburn, 24 miles upon the ſame canal; Baſingſtoke has 22 miles upon the *Baſingſtoke* canal; Whitchurch 21 miles on the *Elleſmere*; Devizes 20 miles upon the *Kennet and Avon*; Bottesford 20 miles upon the *Grantham*; London enjoys the benefit of about 19 miles of level to Paddington, upon the *Grand Junction* canal; Glaſgow 18 miles on the *Forth and Clyde*; Glouceſter is to have 1[illegible] miles upon the *Glouceſter and Berkley*; Shrewſbury has 15½ miles on the *Elleſmere*; Stainsforth 15 miles on the *Stainſforth and Keadby*; Abergavenny 14 miles on the *Brecknock and Abergavenny*; Market Harborough 13½ miles on the *Leiceſterſhire and Northamptonſhire Union*; Shrewſbury 11½ miles on the *Shrewſbury*; and Cromford 11 miles of level on the *Cromford* canal. Another benefit will ſometimes occur from long levels, by the bringing of all, or of a conſiderable number of the locks near together, as at Runcorn on *Bridgewater's* canal, by which they are more effectually looked after and kept in repair. Should it be neceſſary to return the water let down by the lockage, again into the higher pound by the power of engines, as is done on the old *Birmingham*, the *Barnſley*, and many other canals, the having of conſiderable falls in one place will be of material conſequence; but ſtill more ſo if inclined planes are to be uſed inſtead of locks, as on the *Shropſhire*, *Shrewſbury*, and *Ketley* canals. In conducting the line of a canal, it will always be adviſable, if other circumſtances will permit, to bring two or more locks near together, and to erect a lock-houſe for the reſidence of a careful and proper perſon upon the ſpot, to look after and aſſiſt the bargemen in working the locks; where this had not been attended to upon ſome canals, but ſingle locks were placed at great diſtances from each other, the company have, from experience of the damage ſuch locks ſuſtain, found it neceſſary to employ great numbers of lock-keepers, and often to build houſes for the ſuperintendance of ſingle locks. Mr. *Chapman*, who appears to have well weighed the queſtion, whether large or ſmall canals ought to be adopted under different circumſtances, obſerves, "that the ſyſtem of ſmall canals is particularly eligible in all countries where lime-ſtone, coal, iron-ore, lead, and other ponderous articles, not liable to damage from being wet, or likely to be ſtolen, are the objects chiefly to be attended to; and where the declivity of the country runs tranſverſely to the courſe of the canal, which will generally be the caſe along the ſides of mountains, at an elevation above the irregular ground at their feet. In thoſe ſituations, the great falls or inclined planes may be made at the forks of rivers, ſo that the upper levels may branch up both the vales, and thus give the moſt extended communication. A ſituation ſuited for thoſe canals will often be found in countries that are not abſolutely mountainous, but where the ground regularly declines towards the vales of large rivers." The principles for which Mr. *Leach* has ſo ſtrenuouſly contended, of reverſing the uſual order of beginning navigations at the loweſt points or the ſea, and extending them up the vallies towards the ſummits, and, inſtead thereof, beginning near the ſummit or ſource of the water, and continuing the level till the greateſt practicable falls are obtained for inclined planes, would, unleſs the moſt enormous expences were incurred for tunnels, deep-cutting, and embankments, prove too crooked and circuitous for a ready conveyance, as happened on the *Bude and Launceſton* canal, which was propoſed to purſue a ſerpentine courſe of 81 miles, between two places whoſe direct diſtance is no more than 28 miles! The long level of the *Oxford* canal, at its northern end, of which we have ſpoken above, appears among the moſt crooked of thoſe canals which have been executed, and is particularly ill adapted, to the great throroughfare or communication which it forms with other canals. Canals which are to form an immediate connection between the ſea or tide-way at different places, as the *Inverneſs and Fort William, Crinan, Forth and Clyde,* the *Iſle of Dogs,* and the *Glouceſter and Berkley,* muſt be of large dimenſions, or the principal advantages of ſuch a communication would be unattainable; in like manner, the communications between the ſea, and docks or harbours, will ſome of them require to be of ſtill larger dimenſions, as the *Grimſby, Ulverſtone, Dee* new channel, &c. A ſyſtem compounded of *water-levels,* or lengths of canal on different levels without communication by locks, may ſometimes be found adviſable, as on the *Shropſhire, Shrewſbury, Ketley, Leiceſter,* &c. The advantages of being able to conduct a canal, in many inſtances, upon water-tight ſtrata, inſtead of rocky or porous ſoils, and perhaps without loſing ſight of any of the other important conſiderations mentioned, are ſufficiently great to induce engineers to become acquainted with the arrangement and particulars of the *ſtrata* within their diſtrict, by a minute and careful examination, or to call in the aſſiſtance of thoſe beſt informed on ſuch points. We have purpoſely omitted, till now, to mention the conſideration of the value or quality of land to be purchaſed for the uſe of the propoſed canal by different routes; convinced that ſome late canals have been materially injured by the narrowmindedneſs of thoſe who would avail themſelves of cutting through common or low-prized land: even the general conſideration of expence, in the works of a propoſed canal, ſhould hold but a ſubordinate place in the mind of an engineer in the preſent ſtage of the buſineſs, becauſe contracted views in this reſpect may fruſtrate the attainment of a great portion of the benefits to be expected; and it cannot be doubted that any ſcheme of conveyance will beſt anſwer to the adventurers and the public, when conducted upon the principles moſt adapted to the caſe, let the expence be what it may; and fortunately, the commercial and public ſpirit, aided by the means of individuals collectively in this country, has long ſhewn itſelf equal to any enterprize however bold, where advantages can be ſhewn materially to preponderate.

In the particular ſurvey of the line propoſed, all the knowledge of the moſt expert and competent engineers, with the moſt able aſſiſtants, will be requiſite. The rough ſection of the propoſed line, before taken, will enable the engineer to ſee the places of the heights and breadths of the various ſummits, or ranges of high land that are to be paſſed, and whether any two or more adjacent ones can be connected by a long ſummit level, without deſerting any conſiderable town or point of trade, which will diminiſh the difficulties of ſupplying the canal with water, as every ſuch junction of ſummits preſerves the water of two lockages, beſides preſenting ſo many more points at which the canal can be ſupplied with water, from ſprings and rivulets above its level, or where, in leſs favourable ſituations, the ſame can be collected in a lower level to be pumped up. The extremities of the principal ſummit or ſummits being thus nearly ſettled, it will next be inquired, how far it is practicable and adviſable to reduce the height of the ſame by deep-cutting or by tunnelling, or both of them. The adviſable height of the ſummit-level of the canal being ſettled, if water is not in ſufficient plenty, a minute ſurvey of both ſides of the range, or ridge which is to be paſſed, and of all its connecting heights, for a conſiderable diſtance on each ſide of the line, ſhould be made by tracing the propoſed ſummit-level along all the ſides of the hills, particularly noting all the ſprings or rivulets which riſe above and croſs this line; and all ſuch ſtreams of water ſhould be accurately gauged, and the quantity of water which they diſcharge per day determined; the ſame ſhould alſo be done for all the rivulets or ſmall ſtreams that croſs the line of the canal throughout its courſe; and theſe experiments ſhould be made not only where the ſtreams croſs the line, or levels, but at a conſiderable diſtance above and alſo below thoſe points, the particulars of which experiments ſhould be regularly and formally entered in a book, with all the attendant circumſtances, and ſigned by the parties preſent at the making of them; as the ſame may prove of the moſt important uſe in future, either for detecting any ſecret leaks in the canal, or feeders by which any of theſe ſtreams may be increaſed; or, in caſe of future claims being made for the water, or the diminution thereof by mill-owners or others, the company may be prepared, either to make a juſt retribution, or to reſiſt ill-founded or ignorant claims with effect. For calculating the quantity of water diſcharged through gauges or apertures of different kinds and dimenſions, theorems ſhould be uſed which make the neceſſary allowance (deduced from experiment) for the form of the channels or apertures; ſuch will be found in Dr. *Young*'s abſtract of M. *Eytelwein*'s learned German work on Hydraulics, printed in the Journals of the Royal Inſtitution, as alſo in *Nicholſon*'s *Journal,* 8vo. iii. 25. The ſurvey of the ſummit of which we were ſpeaking, ought to be accompanied by a plan, on which ſhould be laid down the exact courſe of every valley and range of hill above the level of the propoſed ſummit, with every particular of the nature of the ſoil in each; that in caſe reſervoirs therein ſhould be found neceſſary to collect rain or ſpring water, the neceſſary extent and probable ſupply of ſuch can readily be determined at a ſubſequent period. From one end of the propoſed ſummit-level it will be right now to proceed with the ſurvey, tracing the level accurately and marking the ſame by pegs or ſtakes, that will laſt for ſome time, and be known by the ſurveyor, who is to follow and make a plan of the line; the levels being frequently transferred to what are called bench-marks, upon the trunk of a tree, a large poſt, or a building, the ſame being noted ſo particularly in the field or ſurvey-book, that they may be readily found for years afterwards. We ſuppoſe the engineers, by this time, to have ſettled the riſe that each lock ſhould have, according to the dimenſions adopted for the canal, the probable ſupply of water on the ſummit, and other circumſtances; the ſummit-level will be traced as above, till the proper place occurs for making a fall of two or more locks, at about 100 yards or a little more from each other; and the places of theſe falls being marked, the level is again to be purſued and traced from the bottom of them, and marked out as before, till the opportunity occurs for another pair or more of locks, or till ſome obſtacle, as a gentleman's park, houſes, gardens, orchards, mills, roads, &c. preſent themſelves at a diſtance; when it will be proper, after referring the level arrived at, to a proper and permanent mark, to proceed forwards, and to examine and well conſider the different ways and levels, if more than one of ſuch preſent themſelves, by which the obſtacle can be paſſed. From the moſt confined part of the courſe for the canal, owing to the obſtacle, it will be right to level back, till the former work is met, and, in many inſtances, conſiderably overlapped, in order to determine the moſt eligible mode of bringing the two levels together, upon the principles before ſtated, if they can be applied, either by adding another lock, or taking one from any of the ſets of them which had been before marked out, as occaſion may require, and marking out the new levels thereby occaſioned: the line between the ſummit and the firſt obſtacle, or confined part of the courſe, being thus adjuſted, a new point of departure is to be taken from ſuch obſtacle, and the level purſued as before, till the fall for a pair or more of locks can be gained, at the proper diſtance from each other. It is probable, that but few ſets of locks can thus be determined upon before ſome new, and perhaps more formidable obſtacle will preſent itſelf, which it will be neceſſary to break off for, and proceed forwards to conſider, and to obviate as before; or the new difficulty may conſiſt of ſome conſiderable lateral valley coming into the one which we are ſuppoſed to be purſuing, which may occaſion an inſurmountable or unadviſable length of embankment and aqueducts neceſſary, in order to paſs it; or ſome gentleman's ſeat, mill, or town, may be found ſo completely occupying that ſide of the valley down which the line was proceeding; that the engineer may find it neceſſary to go back and reviſe a great deal of what he had done, perhaps quite up to the ſummit, and perhaps to take a new courſe down the other, or oppoſite ſide of the valley, or at leaſt to determine where, with the leaſt expence of embankment and aqueducts, the valley can be croſſed to gain the oppoſite ſide. The places of the different ſets of locks, or of ſingle ones, if they cannot be avoided, and the line between each being adjuſted anew, we will ſuppoſe the work again to proceed, till ſome new obſtacle preſents itſelf; this may be either a total change in the courſe of the valley that the line was purſuing, ſo as to render it neceſſary to begin to mount ſome other valley towards a new ſummit; or ſome gentleman's park, who is adverſe to the meaſure, may ſo completely occupy the valley, down which the engineer is intent ſtill upon purſuing his courſe, that it may be neceſſary to ſearch out for the moſt eligible place for tunnelling through the hill into ſome adjacent valley, which is about to fall into the main valley. An inſtance of this latter kind occurred at King's Langley upon the *Grand Junction* canal, where the firſt Act provided for a tunnel of near half a mile in length, in order to avoid Caſhiobury park: but the ſame has ſince been altered, and the courſe of the canal continued through this and ſome other parks, contributing not leſs to them in point of ornament than to the public in utility. It may happen, in caſe of a change of the direction of the valley, rendering it neceſſary to leave it, that ſome other valley may be at no great diſtance, into which the canal muſt be conveyed by a tunnel; and in order to render this practicable, it may be neceſſary to go back, and conduct a good deal of the line that had been done upon a new and much higher level, by omitting ſome of the locks, in order that the level may be conducted through, and ſupply the propoſed tunnel: in accompliſhing this, the former obſtacles may recur again, or new and more formidable ones may be preſented. In this way, the patience, perſeverance, and abilities of the engineer muſt be exerciſed, until a practicable line of ſome length is obtained, and ſtaked out; when the aſſiſtant land ſurveyor muſt follow, and make a correct and particular plan of the line of the ſeveral propoſed locks, embankments, tunnels, &c. upon the ſame, and of the ſeveral fields or pieces of land through which it paſſes, or that come within 100 or 150 yards of it in any part: it will likewiſe be the buſineſs of the ſurveyor to aſcertain, with the utmoſt care, the boundary of every pariſh and townſhip, what county each is in, the proper names of the owners and occupiers of every piece of land in each, however ſmall, upon or within that diſtance of the line, with reference to the ſame upon his plan; and to deſcribe correctly all public and private roads and paths that croſs or interſect the line, and to and from what places they lead; the courſe of all brooks or ſtreams of water, and particularly ſuch as lead to, and contribute to the ſupply of any mill: the ſituation of the houſes and towns upon the line, or within ſome miles of it, ſhould alſo be determined; the nearer they are the greater accuracy will be neceſſary. We will now ſuppoſe the engineer proceeding with the line, from the end of a tunnel into a new valley, the courſe of which downwards is in the proper direction; the ſame proceſs is to be repeated as was purſued in deſcending from the firſt ſummit, until this new valley changes its direction, or until ſome great town or work has been reached, and it becomes neceſſary to change the courſe of the canal, and begin to aſcend ſome new valley or plain towards a new ſummit, or towards ſome mine or work, at which the canal is to terminate: to the new ſummit it will be neceſſary to proceed, and after ſettling the height of the ſummit-level, and taking all the preparatory ſteps for aſcertaining the ſupply of water, and other circumſtances of this ſummit, as deſcribed reſpecting the firſt, the levels will be traced from this ſummit downwards, working backwards or up again, as often as obſtacles may render it neceſſary, until the former work in the valley is met, and a proper junction of them contrived: the whole of this part being adjuſted, the ſurveyor may proceed as before, with his plan and particulars: while we ſuppoſe the engineer returned to the firſt ſummit, and from which he will conduct his line, and avoid the obſtacles thereon, in the beſt way that his ingenuity can ſuggeſt, until he arrives at the navigation or ſea-port, at which his canal is to terminate, and where baſons or docks, more or leſs capacious, according to the expected trade, and wharfs, cranes, and other conveniences, may want planning, for the accommodation of the traders and the public: all which the ſurveyor will proceed to ſurvey and plan, as before mentioned. It may be neceſſary to remark, that every town, mine, or work, which happens to lie higher than the line, and to which a collateral cut is to be carried, muſt be conſidered as a ſeparate ſummit, and proviſion for ſupplying the lockage thereof muſt be made, and ſuch of the examination before deſcribed gone into, as may appear neceſſary; ſuch towns, &c. as lie below the line, and are to have cuts or branches to them, will require water to be let down out of the line to ſupply their lockage; on which accounts, it is highly deſirable, whenever the ſame is practicable, to conduct the line upon ſuch a level, that the collateral cuts may be upon the ſame level, by which the trade thereon is much facilitated, and leſs water required.

A complete plan of the line, and all the projected collateral cuts, feeders, reſervoirs, &c. being finiſhed, the engineer will enter on a moſt careful reviſal of the whole ſcheme, with this plan in his hand; on which all the places where culverts or drains will be required, are to be marked, as alſo the proper places for the bridges, and the neceſſary alterations of the roads and paths, which will be cut off by the canal, ſo that the public may not be inconvenienced and turned long diſtances round about, and ſtill, that as few bridges as poſſible, and thoſe in the leaſt expenſive places, may be erected. In ſome inſtances new channels will require to be cut for brooks and water-courſes, to a conſiderable extent, in order to ſave culverts, or bring them to the moſt deſirable ſpots. For proper ſecurity againſt accidental errors, the whole of the levelling ſhould now be gone over again, and the ſeveral bench-marks compared, and renewed with the utmoſt care by the engineer's aſſiſtants, while he is proceeding with the neceſſary inquiries and calculations, for an eſtimate of the whole expence of the undertaking.

In a great number of inſtances it will be found, that the ſupplying of a canal with water, occaſions no inconſiderable ſhare of the whole expence, either in the firſt coſt of mills or ſtreams of water, in land for, and labour in, conſtructing reſervoirs, engines to pump up water, &c.; or annually ever afterwards, in the fuel for, and repairing of, engines, hire of water from mills in dry ſeaſons, &c.; this ſubject ſhould, therefore, employ the moſt ſedulous attention of the engineer, both to make the moſt economical uſe of what ſtreams he finds, to procure other ſupplies of water at the leaſt expence, but above all, to ſecure an abundant ſufficiency. The dimenſions and height of the locks, and breadth of the canal being ſettled, an accurate calculation made of the quantity of water required to fill a lock; and, with the largeſt probable number of boats that will paſs in a day, the quantity required daily in every part of the canal; this, with a due allowance for the evaporation, from the ſurface of the whole canal and its reſervoirs, and for the ſoakage that will take place into the banks, however well they are conſtructed; will ſhow the number of locks full of water that will be required, from all the different ſources. We have ſpoken of the ſteps proper to be taken for aſcertaining the whole ſupply that can be had above the ſummit's level; and it will often be neceſſary to make a ſimilar inveſtigation, on points below that level, and to conſtruct reſervoirs in ſuch ſituations, to ſupply the neceſſary lockage, for local trade upon the line, near any great town or works, which does not extend to the ſummit, as alſo to ſupply the evaporation and ſoakage of long lengths, in ſituations where feeders or ſprings cannot be taken in by the way; another uſe of reſervoirs in leſs elevated ſituations may be, to compenſate mills that are lower down the ſtreams for the water that is taken for the uſe of the canal from the higher branches, or near the ſources of ſuch ſtreams. For Mr. *William Jeſſop's* obſervations on this ſubject we refer to William Pitt's General View of the Agriculture of Staffordſhire, and to the *Repertory*, vol. iii. p. 243.

There appears no reaſon, under the preſent ſtate of things, why the owner of a mill or ſtream of water ſhould not be compellable to part with the ſame, for the purpoſes of a public canal, any more than another man to part with his field, except the accommodation which the public receive from ſuch mill; and where the ſame, or a ſuperior accommodation, can be enſured to the public, ſurely this ſpecies of property ought to be put upon the ſame footing with land in general. See Dr. *James Anderſon*'s Eſſays, vol. iii. p. 68 to 76.

It ought to be conſidered, that the preſent ſtate of our canals and inland navigations, and eſpecially the extenſion of them, which we are now ſuppoſing, remove one of the principal objections to ſteam engines, by enabling new mines of coals to be daily opened, and the products thereof, as well as of the old mines, to be regularly and cheaply conveyed to every ſituation where engines can be wanted. We would not, however, be ſuppoſed to recommend the annihilation of water-mills; on the contrary, it hath long appeared to us, that their number and their power might, in ſome, and perhaps in moſt inſtances, be greatly increaſed, and yet all the purpoſes of canals be fully anſwered, and thoſe moſt capital improvements of irrigation and drainage at the ſame time extended, to very large tracts of land; for this purpoſe it would be neceſſary, that an entire valley of conſiderable extent, that has a good ſtream of water through it, as the *Colne*, or the *Lea* near London, for inſtance, ſhould be put under a ſyſtem of improvement. A thoroughly competent engineer being employed upon ſuch a work, would be able to conduct a canal rather of large dimenſions perhaps, along one ſide of the valley downwards, until three or four locks, or a fall of 20 to 30 feet was obtained; and, the water in the pound below ſuch ſet of locks to be a ſmall diſtance below the level of the ſurface of the ground, in the loweſt part of the valley at that place, as this would enable the whole ſtream of the river to be taken into the next length of level, as often as occaſion ſhould require it: this new level would be traced, until, by the fall of the valley, it has reached the ſides of the hills, and proceeded with until another ſet of locks, three or four in number, can be obtained, and a deſcent made again to the level of the loweſt point of the valley: this proceſs to be continued through the whole length of the valley, under improvement. The next conſideration would be, a deep and effectual drain, to be carried up through the whole length of the valley, purſuing the loweſt ground, and the middle of the valley nearly, in ſuch parts where the hills on each ſide riſe equally abrupt; but where, as often happens, the deſcent to the valley on one ſide is very ſudden and ſteep, and on the other ſide long and gradual; in all ſuch caſes the drain ſhould be conducted nearer to the abrupt than to the eaſy ſide of the vale, becauſe here the peat or alluvial matters, with which ſuch valleys are choaked up, will be found the deepeſt, and the ſprings in the gravel underneath ſuch peat, the moſt copious and the moſt confined; the new drain ought, in general, to reach the gravel under the peat or ſilth; and where this ſhall be found impracticable, large auger holes ought to be bored at ſhort diſtances from each other, quite through the conſolidated peat and ſilth, to the gravel, to ſet the confined ſprings therein at liberty. Theſe principles of draining a boggy valley we have ſeen ſucceſsfully practiſed in the village of Crawley, below Wooburn in Bedfordſhire, by an agent of the late worthy *duke of Bedford*.

If the fall in the new drain ſhould be found very conſiderable, the ſame muſt be reduced, by placing weirs or well-falls at proper places, to let the ſtream down in an harmleſs manner, which would otherwiſe diſplace the gravel and ſand under the peat, and the ſame would cave in, ſo as to fill up and deſtroy the drain: another excellent uſe of theſe well-falls or weirs will be, to furniſh ſo many points, where the whole ſtream, including the ſprings, can be taken out to ſupply the upper end of the levels of the canal before mentioned, or for the purpoſes of irrigation; as was intended and provided for, in the Crawley vale that we have been ſpeaking of. To all the exiſting mills, which are not too ruinous or badly conſtructed to be worth improving, the channels to the water-wheels ſhould be deepened up from the main drain, or, perhaps, in moſt inſtances, new and more direct ones cut. It will now be practicable for the engineer, in moſt, if not in all caſes, to conſtruct an *over-ſhot* water-wheel upon the ſame axis that before carried an *under-ſhot* one, turning the ſame way and with the ſame velocity as before, ſo that the internal machinery of the mill will need no alteration; and the requiſite quantity of water for working theſe new wheels, which in moſt caſes will be inconſiderable, may be conveyed from the canal on the ſide of the adjoining hill, in aqueducts or elevated troughs of no very expenſive conſtruction, perhaps of caſt iron, or in pipes, which may be conducted under ground, and riſe up to ſmall reſervoirs or pen-troughs above the wheels. As many of the mills will be found ſituated on the oppoſite ſide of the vale from the canal, it may be proper and adviſable in moſt caſes, to conſtruct a cut or water-carriage of ſufficient dimenſions, and with a very ſlight fall, along that other ſide of the vale, beginning frequently at the weirs or well falls in the main drain or new brook, and purſuing the level nearly, as far as is found requiſite; which cuts will much extend the benefits of irrigation, and give opportunities, perhaps, of conſtructing new mills, with over-ſhot wheels of large diameters and proportionate power, to be ſupplied therefrom. In like manner, ſeveral new and powerful over-ſhot mills may perhaps be conſtructed near to the ſeveral ſets of locks upon the canal, without endangering the ſufficiency of water for the lockage: this practice of uniting navigation and mill improvements at the ſame time, we were much pleaſed to ſee enforced by Mr. *Thomas Telford*, in his Report of 1801, printed by order of parliament, upon the intended *Inverneſs and Fort William* canal, p. 46: and the ſame has been ſuggeſted as an appendage to the Woolverton embankment on the *Grand Junction* canal; ſee the *Agricultural Magazine*, vol. viii. p. 24. New and improved mills may often be conſtructed where the point of a hill at a great and ſudden bend of the river can be tunnelled through, from the river on the upper ſide, as appears to have been done at Shrewſbury on the *Severn*, and at Stanley on the *Tay* rivers.

Where the new drain or brook courſe connects with the levels of the canal in the improvement of a valley, as above propoſed, if floods are to be apprehended, or the water is ever found very thick and muddy, weirs or over-falls ſufficiently large to let the flood eſcape down the drain muſt be conſtructed, and ſtop-planks provided to be put down acroſs the canal occaſionally, or a lock capable of a very ſmall fall conſtructed, to be occaſionally uſed, to prevent very muddy waters from entering the canal to ſilt it up. It will frequently happen, that brooks which are making their way laterally into a valley under improvement, may by an alteration of their channel for ſome diſtance up the collateral valley, be brought into the canal in places where a conſiderable elevation on the ſide of the hill has been attained, in ſuch caſes a circular weir or well-fall ſhould be conſtructed in the centre of an enlarged part of the brook, before it arrives at the canal, as has been done by Mr. *James Brindley*, at the mouth of Medlock brook at Mancheſter, on *Bridgewater*'s canal; a proviſion for ſtop-planks, at the junction with the canal, will alſo be proper, to be enabled to turn occaſional muddy water down the well-fall inſtead of into the canal. In order to preſerve a ſufficient elevation in the water-courſe, for ſupplying of mills, or for irrigation, after the canal has deſcended a ſet of locks, and is conſequently too low for this purpoſe, a cut or water-carriage may be taken out of the ſummit's level, and carried on along the ſide of the hill with a proper fall, as far as may be neceſſary. This ſyſtem of improvement in a valley, is capable of being combined with an extenſive application of reſervoirs, for equalizing the head and collateral ſtreams which ſupply ſuch valley, as recommended by Mr. *W. Jeſſop*.

In caſes where the land or park owners cannot be brought to concur in a general ſyſtem of improving a valley, it would often be worth while for a canal company to obtain power from the legiſlature to purchaſe all or moſt of the mills in a valley, through which their canal is to paſs, paying, in the firſt inſtance, the utmoſt value for them; and being alſo bound to erect the ſame number of mills, of equal or ſuperior power, and adapted to the ſame purpoſes, to be ſupplied from higher levels in the manner we have been deſcribing; ſuch new mills to be offered at a fair price, to be ſettled by indifferent perſons, to the owners of the adjoining old mills, before the ſame are diſturbed in the uſe of the old mills, and in caſe of their refuſal to purchaſe, the ſame to be next offered to the perſons who may be tenants to the old mills (in order that they may not be thrown out of employ); and then to any other perſons inclined to become purchaſers, on ſuch terms as they and the canal company could agree upon.

Sometimes it may be practicable to make a bargain for taking weekly into the canal, a ſtream of water which ſupplies a mill, only from Saturday night to Sunday night, paying a fixed rent for the ſame, to be ſecured by the act; an inſtance of which occurs upon the *Montgomery* canal.

The ſubject of ſupplying water for a canal having been amply illuſtrated, we ſhall now return to the reviſal of the ſurvey, and making an eſtimate of the expence of the undertaking, on which we ſuppoſed our engineer to be employed. In reviſing the ſurvey of the line, it may be proper for the engineer to cauſe holes to be dug at certain diſtances, as deep as the canal will require to be cut, or deeper, to inform himſelf more perfectly of the ſoil to be cut in, and the expence attending the ſame, noting particularly the height to which ſprings may riſe in the ſeveral holes. And here it may be proper to notice a very common error, into which the perſons entruſted to execute canals have fallen, in ſuch parts where ſprings appeared beneath the ſurface in the cutting, by concluding that the canal would make water, as they term it, in ſuch parts, and that puddling was unneceſſary; but where too often it has afterwards happened, that ſuch ſprings, from having a variety of other vents or outlets, at or very near to the ſame level, and were, therefore, incapable of being dammed or raiſed much higher than they then appeared; when the canal has come to be filled with water to a higher level, the courſe of ſuch ſprings has been reverſed, and the porous ſtrata through which they paſſed have ſerved to abſorb and diſcharge the water at other places, to a very fatal extent. Land-ſprings, or ſuch as run only in winter, have generally the ſame effect, and in ſummer as copiouſly take in water, when their own ſource fails, as they before diſcharged it. The difficulty of puddling or lining out ſprings, on account of the powerful effort they make to force their way through the lining, as long as the canal remains empty at firſt of water, will induce a careful engineer, to endeavour to avoid, if practicable, all ſprings that will not at all times riſe to a higher level than the water is to ſtand in his canal. It will be part of the buſineſs of this reviſal of the line, to examine what can be done to ſtraighten the canal, we mean as to ſudden bends, by ſmall lengths of deep-cutting, and others of embankment, to correct the plan accordingly, and to eſtimate the extra expence of all ſuch works. The lengths and ſolid contents of the ſeveral embankments, and the diſtance from which the ſtuff or ſoil muſt be fetched for the ſame; the lengths and dimenſions of all the deep-cuttings, and the diſtance to which the ſtuff muſt be removed; the lengths of the tunnels, and number and depths of the ſeveral ſhafts or tunnel-pits that will be neceſſary; the lengths of headings or ſoughs that will be wanted to drain the tunnelling works; theſe, and all the great variety of other works, ſome of which we have already mentioned, and others that we ſhall have occaſion to mention in the ſequel, being particularly ſtated, and prices affixed to each ſpecies of work and kind of material; and theſe prices ought by no means to be below the current prices of the beſt articles of the kind at the time, but due allowance ſhould alſo be made for the advance of prices, which will take place during the execution of the work. The total probable expence, with a due allowance for contingencies, being thus obtained, the engineer will prepare his general report and eſtimate, to be laid, with the plan, before a meeting of the adventurers or propoſed proprietors.

The next ſtep in the progreſs of this buſineſs, after the appointment of a ſolicitor of competent legal knowledge, is an application to parliament for an act, empowering the parties concerned to complete their undertaking.

From the earlieſt times, the parliaments of this country have found it neceſſary to adopt certain ſtanding-orders, or general rules, to be obſerved by the parties who applied for any act of a local or private nature; and theſe ſeem to have guided the conduct of canal projectors, till the number and variety of ſuch applications ſhewed the neceſſity of adopting, on the 7th of May 1794, thirteen ſpecial reſolutions, as ſtanding orders, relating to the introduction and paſſing through the houſe of commons, of any acts for navigable canals, or aqueducts, or for the navigation of rivers; to theſe another was added on the 16th June 1795, reſpecting intended reſervoirs and feeders to a canal or navigation; and another on the 25th June 1799, applying the former orders to rail-ways or drain-roads, as far as the ſame are applicable. The houſe of lords have a nearly ſimilar ſet of ſtanding orders, and one requiring a ſufficient number of copies of an engraved map of the intended canal, &c. to be delivered for the uſe of each member of that houſe.

The number of clauſes, relating to the conſtruction and management of a canal, are neceſſarily very numerous, and it were much to be wiſhed, that the propoſition of Mr. *John Clennel*, in ſeveral periodical works, for a general canal act, to contain all their general clauſes and proviſions, in the ſame way as the general highway and turnpike acts, and the general incloſure act, could be accompliſhed; it would much ſhorten and ſimplify the buſineſs of canal acts and management. Another general meaſure, relating to canals, we beg here to mention, although the application to parliament in the ſeſſion juſt now paſſed (1805) did not prove ſucceſsful, we mean the propoſal for a *general canal company*, for raiſing a large fund, to be inveſted in ſhares of canals not yet finiſhed, and for lending money at intereſt, to ſuch canal companies as may require it, to enable them to complete and render their ſeveral concerns more generally beneficial.

Mr. *William Chapman*, when ſpeaking of the navigations of America, ſays, (Obſervations, p. 64.) "It will be adviſable in a riſing country, to lay out the lines of canals approximately on its firſt ſettlement; reſerving a proper width for them, in the original grant of the lands, with power to exchange the land of that line, for any other found more convenient, on a full inveſtigation; and thus avoid all the difficulties attendant on thoſe meaſures in England." Does not the period of the incloſure of a pariſh here furniſh the ſame opportunity of conſidering the eligible line for a canal; and of ſo contriving the allotments that very few, or perhaps only one perſon's land may require to be cut into, upon the adoption of ſuch meaſures, and that without cutting up or deranging the ſyſtem of his or their eſtate? We were happy to ſee this idea acted upon, as far as irrigation is concerned, in the pariſh of Maulden, in Houghton-Regis near Dunſtable, (into which a cut from the *Grand Junction* canal was propoſed to be brought,) and in ſome other pariſhes in Bedfordſhire, about the year 1797, by the late duke of Bedford's agent.

One of the firſt objects of a canal act is, to incorporate and make a body politic of the proprietors, by a certain *name* and ſtyle, by which they ſhall have perpetual ſucceſſion and a common ſeal, and by which they may ſue and be ſued, and have power to purchaſe lands, to them, their *ſucceſſors*, and aſſigns, for the uſe of the undertaking, without incurring the penalties and forfeitures of the ſtatutes of mortmain; and to enable the company to ſell any lands ſo purchaſed. The ſelection of the name for a canal, is of more conſequence than would at firſt ſight appear. Since canal and rail-way companies have multiplied ſo very much, it is neceſſary on all occaſions to adhere to and uſe their incorporate or *parliamentary names*, a circumſtance which has not been attended to ſufficiently, but ſuch a variety of names have been uſed, in the printed accounts of events upon or relating to our canals, that it is often impoſſible to avoid miſtakes.

It has been uſual to enable the company to raiſe a fixed ſum of money, equal to or exceeding the total eſtimate of expences, by ſubſcription or ſhares; and, in caſe of this proving inadequate, to borrow a further fixed ſum upon intereſt, or on mortgage of the tolls. The many and expenſive acts of parliament that canal companies have been obliged to obtain in the courſe of their work, for powers to raiſe further ſums, and even for regulating and enforcing the mode of raiſing the ſums firſt authoriſed, ſhew the neceſſity of the engineer and ſolicitor paying great attention to this point, and to be careful to apply for powers ſufficiently ample.

The uſual amount of ſhares in canal companies is 100l. but inſtances of 50l. ſhares, and others of leſs or greater value, occur in ſeveral of theſe eſtabliſhments. Theſe circumſtances ought always to be particularly attended to in comparing or quoting the prices of ſhares in different concerns; and we ſtrongly recommend all future ſhares to be 100l. ones, eſpecially as the legiſlature will permit of half ſhares, or even lower diviſions, down to the eighth of a ſhare, as appears in the *Grand Junction* act, 43 Geo. III.

To prevent the intereſt of any individuals from preponderating, and to increaſe the number of perſons having an intereſt in the ſucceſs of the undertaking, it has been uſual to limit the number of ſhares which any individual can hold, under forfeiture of all above that number, except they came to him or her by will, marriage, or other legal proceſs.

The election of a committee of management, and all queſtions agitated in the company are decided by votes, not perſonally, but according to the number of ſhares held by each perſon, to a limited extent, and uſually two half ſhares carry one vote. The uſual limitation to prevent any individuals from poſſeſſing too great power in the company is, that no more than 15, or ſometimes 20 votes ſhall be given by one perſon; while in the *Newcaſtle-under-Line* only 6 votes are allowed; and in the *Croydon*, *Peak foreſt*, and *Thames and Medway*, no more than 5 votes can be given by any one proprietor.

General meetings of all the proprietors are provided for, on any important occaſion, as well as annually to elect the committee and officers.

Proviſion ſhould be made for progreſſive calls on the proprietors, by the committee, for their ſeveral ſubſcriptions; theſe ſhould be on as long notice as is eligible; but they muſt be prompt and ſtrictly enforced, or the progreſs of the works will ſuffer.

The enactments relating to purchaſing of lands, and aſcertaining the value thereof, where the parties and the company's ſervants do not agree, by means of the commiſſioners, will be neceſſary, who generally conſiſt of all the conſiderable land-owners of the county, or of a jury to be impannelled for ſuch purpoſe, theſe ought to be very clear and explicit: ſo ſhould the regulations and forms for ſelling and transferring ſhares in the concern.

The moſt ample powers ſhould be given to enter upon, and dig, and conſtruct, both the permanent and all temporary works which may be neceſſary; with proviſions, in caſe of refuſal, to accept the compenſation offered for damage; that the commiſſioners or a jury ſhall ſettle the ſame without delay or further appeal, except, in ſome inſtances, to the next quarter-ſeſſion of the county.

A clauſe is generally inſerted, confining the company to the line that is laid down in the plans that have been depoſited with the clerk of the peace and with the houſe of commons, or within certain limits on each ſide thereof; the uſual deviation diſtance allowed is 100 yards; however, many inſtances have occurred, which ſhew how very important it is to the proprietors, that the line of the canal, and every probable cauſe for the neceſſity of deviation, ſhould have been thoroughly examined and weighed by the engineer, and the line ultimately adjuſted, before the plans are completed and delivered.

The prudent precaution of the legiſlature, has always limited the width of land which canal proprietors have been empowered to purchaſe for their canal, in ordinary caſes, without the free conſent of the owners; this has been 26 and 30 yards, in the greater number of inſtances, but in others the ſpace allowed for the canal towing-path and fences has been leſs or greater, according to circumſtances.

Where wharfs, docks, or baſons, or places for barges to turn and paſs each other, or where deep-cutting or embankments are required, it has been uſual to allow 100 yards in width to be purchaſed; but from this allowance there have been occaſional deviations.

Except in ſome rare and peculiar inſtances, like the *London Docks* in Wapping, the parliament will not give to any company the power of purchaſing houſes or other buildings, gardens, orchards, yards, parks, paddocks, or planted walks or avenues leading to any houſe, except the previous conſent of the owners thereof be obtained; and where this has been got, it is the ſafeſt way to inſert a liſt of all ſuch owners, with a deſcription of the property they have agreed to give up, as a ſchedule to the bill: and the ſame of all material contracts for mills, ſtreams of water, or ſprings, which the company may have made. Houſes built, or orchards, &c. made as obſtructions, ſince the ſurvey was made, and notices given, will not meet with the ſame protection; and a clauſe ought to be inſerted to put them upon the ſame footing with lands in general.

Powers ſhould be given for erecting public wharfs, and for demanding and enforcing certain equitable rates of wharfage for goods, according to the length of their continuance on the company's premiſes.

The toll, or rates of tonnage, which the traders are to pay to the company per ton per mile for the liberty of navigating upon the canal, or its various branches, rail-ways, or inclined planes, require the moſt deliberate conſideration, that every ſpecies of trade may pay its proportion, and none be diſcouraged or leſſened by the expences of conveyance.

In ſome caſes proviſion has been made, that when the net profits of the concern exceed a certain rate per cent. the tonnage or tolls ſhould be reduced.

There have been exemptions from tolls, on ſeveral canals, in favour of officers and ſoldiers on their march, with their horſes, arms, and baggage. Timber for the uſe of his majeſty's navy, and government ſtores of all kinds ſometimes paſs toll free; ſo do gravel or other materials for the making or repair of roads in moſt inſtances. In ſome caſes, canals have been projected principally with a view to tonnage on lime, and other manures and agricultural objects and produce; but with this exception, it has been uſual to allow lime and all manures to paſs, either on very low tonnage, or abſolutely toll free, on the levels, and through the locks alſo on ſome, particularly when the water actually runs over, or is within a quarter or half an inch of the top of the lock-weirs; in ſome inſtances, ſeveral hours notice is required, of boats with manure or road-materials intending to paſs any locks toll-free. In ſome inſtances, where a canal is to run parallel to a turnpike road, and is expected to leſſen the tolls thereof, by the diminution of heavy waggons and carts, it has been uſual to compenſate or indemnify the creditors on ſuch roads; and it ſeems equally juſt, where a turnpike road croſſes a canal, and is likely to have its tolls both ways increaſed, that they ſhould not be entitled to receive materials by the canal tonnage free.

Mile-ſtones are directed to be fixed on banks of moſt canals, for regulating the diſtances and tonnage; in ſeveral inſtances, theſe are directed to be placed every half mile, and in others one is to be placed at the end of every quarter of a mile.

We ſhould far exceed our due limits, if we were minutely to recount the various expedients that have been adopted for conciliating the owners of lands, parks, mills, &c. who may more or leſs be affected by different canals. Theſe muſt depend on a variety of local and incidental circumſtances, for the adjuſtment of which no general rules can be preſcribed. But in all caſes of this kind the canal companies have uſually propoſed, and the legiſlature has ſanctioned, an adequate compenſation. Proprietors of land and their tenants are ſometimes allowed the uſe of the towing-path, as a drift and bridle-way between their different lands, or to ſome public road; the owners of the adjoining lands are often allowed to make, not only docks and baſons communicating with the canal, but collateral cuts of conſiderable extent, to their mines and other works; but previous notice of all ſuch intentions ought to be given to the company, that their engineer may examine the ground, and direct the neceſſary puddling and other precautions, to ſecure the line of canal from loſing water to a prejudicial extent thereby.

The company are often empowered, and ſometimes required, to make collateral cuts, or rail-way branches to particular towns, mines, or works; and a very proper precaution ſeems to have been adopted in the *Somerſet Coal* canal act, that the parties to be benefited by ſuch branches ſhould firſt give the company ſecurity to make up the tolls thereof, by an annual payment, in caſe of their falling ſhort of a reaſonable intereſt on the money expended upon ſuch branches.

In ſome inſtances it may be neceſſary, particularly on railways, to permit individuals to conſtruct and manage ſuch part of the works as paſs through their own park or ground, but ſubject to the general ſyſtem of management laid down in the act; as is done by the *duke of Beaufort* on the *Swanſea* canal, and by *ſir Charles Morgan* on the *Sirhowy* tram-road; alſo to conſtruct particular parts, on being paid for the ſame, as was done by the *Dee* river company, at the croſſing of the *Elleſmere* canal.

Clauſes are generally inſerted, requiring the canal company to remove and clamp the top ſoil, or vegetable mould, to the depth of nine inches, from the whole width of the intended works; which, after the ſame has been completed, and all the banks and excavations properly ſloped down, is to be returned and ſpread upon them, ſo as to render all the land, not actually occupied by the canal and works, capable of cultivation; but a ſmall part of this top ſoil is wanted in general upon the banks, and it might, more profitably for all parties, be filled by the company's men into the carts of the neighbouring farmers, to be ſpread upon the poorer parts of their lands.

*Watering places* for cattle are generally directed to be made, eſpecially where the fields may have been deprived of their old ones by the cutting of their canal. In counties where irrigation is much practiſed, as in Wiltſhire and ſome others, it has been common to appoint ſkilful and reputable perſons to guard the intereſts of the irrigators, on the cutting of canals.

On the duke of *Bridgewater*'s canal, irrigation trunks were laid below the bottom of the canal, ſo that, by means of a harrow, or rather a large hoe, drawn along, the mud of the canal was drawn to the valve or orifice of the trunk when open, and the mud was thus conveyed to the meadows bebelow. A ſucceſsful experiment was here alſo made, of bringing up barges laden with ſea fluſh, or mud taken up at low water, in the Merſey, and this was gradually poured or thrown out into the canal, over the irrigation trunks while running, by which means this valuable manure was at once conveyed to and effectually ſpread on the meadows below. We have been greatly ſurpriſed to find irrigation ſo little practiſed upon the lands below canals, which ſo perfectly admit of that improvement; were this ſubject properly attended to, in ſituations where water is plenty, we doubt not but ſome proprietors or leſſees of land would be found, who would readily contract with the engineer, on the part of the company, before the canal is completed, to pay an annual rent for certain quantities of water, to be let out by the company's agents, at ſtated times, through a trunk, which might be laid beneath, or level with the bottom of the canal for ſuch purpoſe, at a very eaſy expence, before the water was let into the canal; and even after canals are completed, there are ſituations where the intereſt of all parties might be ſerved, by laying trunks for irrigation; and perhaps farmers ought not, except in ſome few inſtances, to be debarred from conſtructing or uſing proper weirs at the ſame immoveable height, or a little higher than thoſe at the lock-gates, to take off the ſurplus water for irrigating during the winter ſeaſon.

Sometimes it will happen that a canal can be conducted on a proper level to ſuit the adits to mines, as at Worſley on *Bridgewater*'s canal, and ſome others; or perhaps the tunnel through a hill may be applicable to mining purpoſes alſo, as at Morwelham down, on the *Taviſtock*, near Ripley on the *Cromford*, the Harcaſtle tunnel on the *Trent and Merſey*, and others.

Coal-mines may be allowed to have the neceſſary paſſages for their works under a canal, but ſhould be reſtricted in the number, width, and height of theſe, as on the old *Birmingham* canal; or if the veins are near the ſurface, the ground may be ſo entirely broke in, that the canal would be deſtroyed, as has actually happened on ſome of the branches of the above-mentioned canal, near to Wedneſbury.

Reſpecting mills, it may be neceſſary ſometimes, where the canal is to be conducted near to eſtabliſhed mills, that they ſhould be ſecured againſt other mills in the ſame line of buſineſs being erected on the canal at that place, as in the *Sankey* canal act. Sometimes gauge-weirs, or ſelf-regulating ſluices, may be neceſſary to be maintained, to ſupply mills or other canals with a regular and conſtant quantity of water; inſtances of which occur on the *Rochdale* canal, and at the Amſworth reſervoir, on the *Nottingham* canal; the theory of the regulating ſluice, in the latter place, will be found in the *Gentleman's Diary*, 1799, p. 43. by that eminent mathematician and coal-worker, Mr. *Thomas Walker*, of Bilborough; and if theorems for the widths and heights of ſluices to diſcharge given quantities of water per day be wanted, *Nicholſon's Journal*, 8vo. vol. iii. p. 29. and 34. may be conſulted with advantage. Thoſe who may wiſh to ſee how the ingenuity of mill-owners can be exerciſed to ſecure themſelves againſt poſſible injury, or even to thwart a canal ſcheme, may perhaps conſult the *Croydon* canal act, for the clauſes relating to the Wandle river.

Where a connection is to be made with any other canal lying upon a higher level, or even the ſame level, where leakage or waſte of water is to be apprehended, that would be prejudicial to either of the canals, it is uſual to provide, that a ſtop-gate ſhall be erected at or near the junction, which one or both of the canal companies are empowered to ſhut and lock up whenever there is ſuch a lowering or draught of water upon one of the canals, as would endanger the ſupply or lower the head of the other; clauſes for theſe purpoſes will be found in the *Dearne and Dove*, *Dudley*, *Stratford*, *Warwick and Birmingham*, *Wyrley and Eſſington*, and other acts. And when any canal joins another, coming down from a hilly country, it is uſual to require tall-gates to be erected, with capacious weirs for preventing of floods from the upper canals making their way into the lower one, as in the *Aberdeen* canal. It will very often happen, that tolls or dues will be to be paid by barges for entering any of the exiſting navigations from the new canal, or *vice verſa*. And where the new ſcheme can be ſuppoſed to interfere materially with the trade on any former one, it has not been unuſual to guarantee that their net profits or tonnage ſhall not be leſs, after the completion of the new canal, than before; or ſometimes annual payments are agreed to be made as compenſations for the expected loſſes to older navigations; and in ſome inſtances, where the rivalſhip is expected to be very formidable, as on the *Douglas River* by the *Leeds and Liverpool*, and the *Derwent River* by the *Derby* canal, proviſion has been made, that the old concern ſhall be purchaſed by the new proprietors at a fixed ſum; the ſettlement of the various compenſations that may be neceſſary on a canal are often ſuch as to require the exertion of the utmoſt abilities of the engineer, with the moſt able aſſiſtance, as the very long and complicated clauſes in many acts will ſhew.

On applying to parliament for any conſiderable extenſion of a canal, or to raiſe more money, there are inſtances, and perhaps very proper ones, of enacting that the ſhares of certain diſcontented proprietors ſhould be purchaſed out of the new funds, as on the *Dudley*, the *Kennet and Avon*, and others.

So attentive has the legiſlature been, even to the comfort of proprietors or inhabitants near intended canals, that it has been enacted, as on the *Barnſley* canal, that where ſteam engines were to be erected in certain places, for the uſe of the canal, their fire-places ſhould be ſo conſtructed as to conſume the ſmoke.

Ample proviſions ſhould be made, for powers to make bye-laws for regulating the trade upon the canal, for the form and dimenſions of the barges or boats to be uſed thereon, and for paſſing the locks, inclined planes, &c. that may be thereon. It is neceſſary to declare, that the canal is not to be ſubject to the interference of the general commiſſion of ſewers; manorial rights, and fiſheries in old ſtreams, or waters ought to be reſerved; and it would be well for the encouragement of theſe great national improvements, if the legiſlature would permit a clauſe to ſtand, as in the older acts for *Bridgewater*'s and other canals, that the proceedings and writings of the company ſhould be valid without ſtamps.

It has been uſual to enact penalties for a variety of offences likely to be committed upon the canal; and for malicious damaging or deſtroying of the works to declare the offenders guilty of felony, and liable to tranſportation for ſeven years. There are many other things which will require to be taken into conſideration at the period of framing the act of parliament, ſome of which we ſhall avoid repetition by mentioning, when ſtating what occurs to us on the practice of executing and managing canals, to which we are now anxious to proceed.

The act of parliament for a canal being paſſed, and therein the time and place for the firſt meeting of the ſubſcribers or proprietors thereof being fixed; one of the firſt buſineſſes of ſuch meeting will be the election of a *general committee of management*, conſiſting of the moſt independent, reſpectable, and generally informed perſons among the proprietors. The committee of management will then proceed to elect a chairman and ſubordinate officers; to fix upon their place of meeting, and to arrange the order of their buſineſs.

It will not often happen that the engineer can be ſpared from the projection and ſuperintendance of other great concerns, to attend to the cutting of the canal and erection of the ſeveral works, without the aſſiſtance of a *reſident engineer*, or more than one, if the line be of conſiderable length, and diſtant parts of it are intended to be proceeded with at the ſame time; and the committee will do well to leave it to their engineer to recommend all ſuch aſſiſtant or reſident engineers from among thoſe who have been brought up or employed under him, or are well known and approved by him, for their mathematical knowledge and practical ſkill, experience and attention in the ſeveral kinds of works that are to be executed. The attention of the committee ſhould be directed to fixing upon ſome *land ſurveyor and valuer* of reſpectability and great practical knowledge, who has been uſed to and acquired addreſs in the negociation and ſettlement of purchaſes and exchanges of property of different kinds; and if he has before been employed upon canals he will be ſo much the more fit. In this ſtage of the buſineſs it may be well alſo for the committee to conſider whether any *local committees*, or a *ſelect committee*, may be neceſſary, to pay the more minute attention to, and to bring before them, the concerns of particular diſtricts of the canal, and to ſerve other purpoſes.

The body of the proprietors, aſſembled in a general meeting for the purpoſe of completing the organization of the affairs of the company, will proceed to the choice of a certain number of auditors of their accounts, and to ſettle the ſalaries of all the perſons that are employed.

Moſt canal acts direct, that two copies of the plan of the canal and book of reference, with any amendments or alterations that may have been made in parliament, are to be certified by the ſignature of the ſpeaker of the houſe of commons; one of which is to be lodged with the clerk of the peace for the county, and the other with the clerk to the company, who are required to produce the ſame, and ſuffer copies or extracts therefrom to be at any time taken by any perſon, and to produce the original before the committee, or any jury who may be called on to decide any matter or diſpute relating to the making or maintaining and uſing of the canal.

The engineer being now informed of the exact bounds within which the law has confined his operations, and of the ſeveral reſtrictions or alterations that may have been impoſed or made ſince his former ſurveys, will, in all probability, find it neceſſary to look over the line and all the propoſed works again, accompanied by the intended reſident engineers; and, in ſuch reviſal, it will be proper to divide the line of canal, and the ſeveral works thereof, into the neceſſary number of parts, and to give conciſe and definite names to each, that are to be uſed in future, in contracts and bills, &c. of which diſtinct parts or diviſions a ſeparate account of the expences ſhould be ſtrictly kept by the reſident engineer, the *overſeers*, or counters as they are generally called, (that the engineer is to recommend or employ upon the works) and by the office-clerks in a ledger, with proper heads for each length of canal, ſet of locks, tunnel, embankment, deep-cutting, reſervoir, aqueduct, or other great work, that may form a ſeparate diviſion: ſuch particular and divided accounts of the works will prove of the moſt eſſential ſervice to the committee, and to all others concerned, in informing and maturing their judgment on the actual or probable expence of every different kind of work; and will enable the committee to account to the proprietors how great, and ſometimes unavoidable, as well as unexpected, expences may be incurred.

The committee ſhould now well conſider and inquire, whether any particular part of the line can be completed and opened with advantage, before the whole length can be got ready; and this being determined upon, the engineer ſhould compare and conſider, from the eſtimates and particulars that he poſſeſſes, the comparative length of time that every particular work upon the length intended to be firſt completed will require; and in this order, or with a proportionate exertion and number of men, ſhould the ſeveral works be entered upon. Immediately after the plan has been ſettled, preparations ſhould be made for providing all neceſſary utenſils and implements.

The Act for a canal ſhould give the company and their ſervants power to enter upon and occupy, for the temporary purpoſes of their works, heaps of ſoil, &c. any land except parks, orchards, and gardens, within the limited diſtance, on condition of their making a full and ample ſatisfaction, by annual rent, to the former occupier or leſſee, and for all damage to the owner and occupier, ſo ſoon as the works are completed, and the heaps, &c. can be removed or levelled down, and covered with ſoil. The tunnels, deep-cuttings, embankments, or other great works, that are firſt to be begun, (and the levels, widths, &c. of which we ſuppoſe to be completely ſettled,) ſhould be now marked upon the ground, with the neceſſary allowance of width for the ſlopes, and the ſpoil-banks, which the engineer may judge right to remain the permanent property of the company.

The land-ſurveyor ſhould now proceed to treat, under the direction of the committee and the engineers, with the ſeveral parties who are entitled to the land that is wanted; for this purpoſe, it will be right for the ſurveyor to prepare correct and explicit plans and admeaſurements of every piece of land, and, in many inſtances, to deliver copies of the ſame to the parties; to conſider well the intrinſic value of the land to the owner, and of any extrinſic or artificial value which it poſſeſſes, with ample allowance for the injury that his remaining property will ſuſtain by being detached, or by the fields being cut into inconvenient and aukward ſhapes, or on any other account.

It is generally provided, in canal acts, that where any perſon's eſtate is cut in two by the canal, and a part, conſiſting of leſs than a certain quantity, is ſevered from the reſt, the company ſhall be compellable to purchaſe ſuch detached part, if the party wiſhes it. And it ought to be provided, that the company are not to be obliged to make an occupation-bridge for leſs than a certain number of acres, unleſs the dwelling-houſe or farm-premiſes of the eſtate happen to ſtand upon ſuch ſmall detached part.

As ſoon as the ſurveyor has made his contracts or ſhort agreements with the parties, containing a full deſcription of the lands or other property to be purchaſed, the ſame will probably be put by the committee into the hands of the clerk to the company, with directions for him to enquire into the nature of the titles of the parties, and prepare conveyances accordingly, in the ſhort and ſummary form that the Act ought to provide for ſuch purpoſe: in like manner, where the parties who own the eſtate could not be come at, or have not been brought to agree by the ſurveyor, he ſhould furniſh the committee with the particulars of ſuch property, the price offered, and other particulars of the negotiation; in order that the clerk may be directed to prepare the neceſſary notices for a meeting of the commiſſioners deſcribed in the act, or a warrant to the ſheriff of the county for empanelling a jury to hear the evidence, who are to be ſummoned on the part of the company, and thoſe produced by the owner of the eſtate, and to view and examine the premiſes if neceſſary, and to give their verdict or aſſeſſment of the ſum that is to be paid by the company, and accepted by the parties.

The ground for the neceſſary reſervoirs, to ſupply the part of the line that is to be begun, ought to be among the firſt that is marked out, including ſpace for the head or new embankment that is to be made, and ſhould be treated for and purchaſed by the ſurveyor, and conveyed as above mentioned. The ground whereon the locks are to be built, or any wharf or walled baſons are to be made, ſhould alſo be carefully aſcertained by the engineer, and purchaſed in an early ſtage of the buſineſs, in order that the ſummer ſeaſons may be fully embraced, for the building of all the maſonry and brick-work.

The modern acts for canals uſually contain a clauſe, requiring all the top-ſoil to be removed. This, of courſe, will be attended to before any of the works are begun.

It has been found, from experience, that the banks of canals againſt which the water is to lie, ought, in general, to have their ſlopes ſo apportioned, that one foot in depth will give a horizontal baſe of one and a half foot; and to theſe or ſome proportions near them, rather above than below, as ſlopes of $1\frac{1}{2}$ to 1 are in general too ſmall, will the widths at top and bottom, and the depth of the intended canal probably be fixed by the engineer: and it has been found convenient and proper to make up the banks of canals one foot higher than the water is intended to ſtand in them.

We are now to ſuppoſe the reſident engineer to be proceeding with the ſetting out of the canal, being furniſhed with a map of the ſeveral fields through which it is to paſs, the line that is proviſionally ſettled for its courſe, but with liberty to deviate within certain limits therefrom, and with bench-marks which the engineer has left and deſcribed at certain diſtances, to regulate the top-water level, or height of the water in the intended canal; and, as above obſerved, one foot higher will be the level of the top-bank, or height of the banks.

It will be proper for this engineer, and we ſhall in future, for the ſake of diſtinction, denominate the other the *principal engineer*, to trace the levels accurately of each pound or level reach of the canal, and to put in level-pegs or ſmall ſtakes, at every two or three chains, more or leſs according as the ground is more or leſs undulating, as he proceeds; wherever the canal is conducted along the ſide of a hill, as will happen in a great portion of its length, the level-pegs are not to be placed exactly along the line that the principal engineer has marked out, but either above or below that line, as the ſlope of the hill may occaſion, exactly at that point in every place, where the level of the top-bank (traced by means of a good ſpirit-level, with teleſcopic ſights) cuts or interſects the ſurface of the hill. In ſome places it will be found that the principal engineer has drawn his line acroſs the point of a hill, ſo as to occaſion deeper cutting than uſual, to avoid going round it; or, on the contrary, croſſed a vale or low place, ſo as to require leſs cutting or perhaps none at all, to avoid taking a circuit up that vale to follow the level of the ground; and if either of theſe deviations ſhould be ſo conſiderable that the level-peg would fall more than two chains or thereabouts from the line, down or up the ſlope of the ground, the plan of having level-pegs upon the ſurface muſt be departed from, and holes ſhould, in the firſt caſe, be dug at proper diſtances in the line, and pegs put into the ſame with their tops to the right height; or, in the ſecond caſe, longer and ſtouter ſtakes ſhould be uſed, particularly in the fences that are croſſed by the line, or other places where they will not be liable to diſturbance, and drove firm into the ground till their tops mark the right level. In tracing theſe levels, the engineer will refer to and compare his work with all the bench-marks before deſcribed, and at each end of a level or reach, will level up and down to the bench-marks of the reach above and below the one he has been working at, and compare the ſame with the fall that the locks at each place are intended to have. And we recommend particularly to the engineer to be very punctual in entering minutely in his field-book the particulars and ſituations of the ſeveral level-pegs, and to make one or more of the men who aſſiſt him in levelling, perfectly acquainted with the ſituations and diſtinguiſhing marks of them, and frequently to cauſe them to be looked over and renewed; or continual repetitions of conſiderable lengths of the work will be neceſſary, owing to the diſturbance and loſs of the pegs by the cultivation of the fields and treading of the cattle, or by the interference of idle and miſchievous perſons of the country. Too much caution cannot ultimately be taken, by frequent reference to the bench-marks, with due allowance for any accidental variation that may have been diſcovered among them, and repetitions of the levelling, to avoid thoſe diſgraceful blunders into which ſome leſs capable and leſs careful engineers have fallen.

We are now to conſider, that the great *deſideratum* in canal digging is, that the ſtuff that is dug from one part of the work, ſhall, with the leaſt labour or diſtance of moving, exactly ſupply or form the banks that are to be raiſed in another; ſo that on the completion of the work, no ſpoil-banks or heaps of uſeleſs ſoil ſhall remain, or any ground be unneceſſarily rendered uſeleſs by excavations or pits. Six different caſes will be found frequently to occur in the cutting or forming of a canal. (*Plate I. Canal, figs.* 1, 2, 3, 4, 5, and 6.) A′A E L P P′ being, in every caſe, the line or ſurface of the ground acroſs the canal; A B C E, in the firſt five caſes, the bank on which the towing-path is to be made, and therefore generally the wideſt; L I K P in *figs.* 1, 2, and 5, the off or ſmaller bank; C I is the top, F G the bottom, and C F and I G the ſloping ſides of the canal, in every caſe. The bench or berm, I K, in *figs.* 3 and 6, is provided to retain and prevent the looſe earth that may moulder down from the upper bank P K from falling into the canal. Sometimes the interference of proprietors, or other cauſes, may occaſion the towing path to occupy the bank, or place of the bench I K, inſtead of B C, which will cauſe a conſiderable difference in the calculation or meaſure of the ſtuff to be moved in *figs.* 2, 3, and 5, but the ſame do not properly form new caſes. The firſt caſe occurs moſt frequently in cutting acroſs or along level meadows, and we were not ſo well able, when treating of the firſt ſurvey or projection of a canal, as we now are, to explain a limitation which ought to be attended to in all ſuch level-cutting, eſpecially if of any conſiderable length, viz. that the height or level of the canal ſhould be ſo contrived, that in any croſs ſection, as *fig.* 1. the ſum of the areas of A B C E and L I K P ſhall juſt be equal to E F G L, the part excavated or dug. It will readily be perceived that *figs.* 4 and 6, are indeed other caſes of level cutting, occurring wherever the principal engineer has, in croſſing a vale, or point of a hill, found it neceſſary to preſerve his level above or below what would otherwiſe have been deſirable, if to be accompliſhed, as in our firſt caſe. The engineer will find abundant inſtances of *figs.* 1, 4, and 6, in all their degrees, and in a great portion of which there will either be a want of ſtuff to form the banks, as in *fig.* 4, or a redundancy from the deeper cutting, as in *fig.* 6, and the perfection of his ſkill will be ſhewn in ſo conducting the line, that every embankment, as *fig.* 4, ſhall have deep-cutting at both, or at leaſt at one of its ends, to furniſh the extra ſtuff, with the leaſt expence in moving it; in like manner, every deep-cutting, as *fig.* 6, ſhould have embankments at one or both of its ends, to receive the extra ſtuff. It is further evident, that the other three caſes, viz. *figs.* 2, 3, and 5, are but varieties of ſide-lying ground, or wherein the canal is conducted along the ſide or ſlope of a hill; and where it is evident, that a proper choice of the ſituation of the canal, higher up or lower down the hill, may occaſion A B C E and L I K P, the banking in *fig.* 2, together to be exactly equal to E F G L, the digging in this caſe; in like manner, where the ſlope of the hill is ſo conſiderable as to admit of no upper bank, as *fig.* 3, the bank A B C E may be equal to the cutting E F G I K P; it may be on a conſiderable ſlope that embanking is required, as in *fig.* 5, in order to preſerve the moſt direct line, or to reach any particular object; or deep-cutting may, and often does, occur in ſloping ground, and not in level, as we have ſhewn in *fig.* 6, but it ſeemed unneceſſary farther to multiply our caſes to delineate ſuch varieties. An attentive reader will find no difficulty in tracing every poſſible variation, by conſidering the line A′ P′, which repreſents the ground to vary in all degrees both of height and inclination, while the banks and canal, A B C F G I K P, remain fixed; and in this, almoſt the ſimpleſt inquiry that occurs in ſuch a work, it cannot fail of appearing, how eſſential a good knowledge of mathematics is to every engineer, and that none ought to be admitted to that honourable diſtinction, who are unlearned therein, however much they may have ſeen, or even executed, under the orders of abler men.

Our ſecond and third caſes requiring more than ordinary conſideration, before the line of the canal can be definitively ſettled, and the ground be marked out and purchaſed, unleſs waſte is committed, in purchaſing more than the company have occaſion for; we have repeated them again in *figs.* 7 and 8; and therein produced the lines of all the banks, by which the ſituation of the level-peg, of which we have ſpoken above, is ſhewn at a. It is alſo evident, that the lengths and poſitions of all the lines, B C, C F, F G, G I, and I K, being given, as alſo the poſitions of the lines B A, K P, and A′ P′; that the areas of the ſeveral triangles a B C, b F G, b C I, c I K, e F g, and e C K, and of the parallelogram I K g G, are known; and the calculation of theſe ſeveral triangles will generally, in practice, be very eaſy, from the conſideration of their being all ſimilar and iſoſceles. It is farther evident, that the triangles a E A, b E L, c P L, b E e, and f E P, are in general ſimilar: from ſuch conſiderations, theorems can be deduced, ſhewing, in every caſe, the diſtances d L and d E of the ſlope-holes, or edges of the cutting L and E, *fig.* 7, from the level-peg d, or of d E and d P in *fig.* 8; as likewiſe the diſtances d I and d C of the top edges of the canal, meaſured upon the level, from the level-peg; ſo that the ſtuff to be dug may juſt form the banks. The diſtances d A and d P, *fig.* 7, and d A, *fig.* 8, that determine the points A and P, at which the banks are to be begun, are alſo eaſily deducible from the ſame conſiderations; and it is evident, that A P is the width of ground that ought to be purchaſed, except in ſuch caſes where a hedge may be neceſſary at P, or, as may ſometimes be adviſable, a hedge at the bottom of the ſlope at A, inſtead of its top B, when the neceſſary width for one or both of theſe hedges muſt be added to A P. The inveſtigation of theorems for the above purpoſes, and others which we ſhall have occaſion to mention, would lead us farther into the ſubject than would, perhaps, be proper, eſpecially as no perſon ought, in our opinion, to undertake or meddle with the direction of ſuch works, who is not only capable of uſing a theorem laid down by another, but of inveſtigating and preparing rules for every caſe that can occur, or be wanting in his own practice. We proceed, therefore, to adviſe the reſident engineer, on being furniſhed with the dimenſions that the canal and its banks are to have, to calculate tables for readily finding the diſtance d h of the level-peg from the middle of the canal, meaſured on the ſlope of the hill, let the hill ſlope with whatever angle it may; or rather, let the angle i d h, or depreſſion of the ſlope below the horizontal line i d, be what it may; and this will be moſt conveniently expreſſed, not in degrees, but by the natural ſines of the angle of the depreſſion; becauſe then, if a meaſuring chain of 100 links be laid down at length, upon the ſlope of the ground, and the difference of the level of its two ends be taken in links by the ſpirit-level, theſe will expreſs the two firſt figures of the natural ſines of the depreſſion, which is quite as great exactneſs as ſuch tables need be calculated to. The engineer will now proceed to put in a ſtake oppoſite to each level-peg, at the proper calculated diſtance down the ſlope, for the approximate or ſuppoſed middle line of the canal: theſe ſtakes will ſeldom be found for any conſiderable diſtance together, to range in a ſtraight or in any other regular line, that will be proper for the canal: and a very difficult and nice part of the engineer's duty is now to be performed, in ſtaking out a new line with a taller or a quite different ſet of ſtakes from thoſe formerly uſed, to avoid confuſion; this is called ſtaking the middle range of the canal. The requiſites in this new line or range for the centre of the canal is, that it ſhould as nearly coincide in every part with the ſtakes that were laſt put in by the calculation, as poſſible; that, where, in order to preſerve a regular and handſome line, and avoid the aukward, inconvenient, and unmeaning crooks and bends, with which too many of our canals, and even ſome of the lateſt conſtruction, are almoſt in every part diſgraced, the line is conducted higher than the calculated ſtakes for one or more ſtakes together, care muſt be taken that it ſhall quickly be conducted below others, ſo that the redundancy in cutting deeper into the hill in one place may be as exactly as poſſible balanced by a deficiency juſt by, owing to the line being conducted below the level-ſtakes. Beſides the conſideration above, it will be the time now to eſtimate and conſider the quantity of ſtuff that will be wanted to land up every bridge and lock, and to give extra thickneſs to the banks on which any toll-houſes, warehouſes, or other buildings, are to be erected, or trade carried on.

In narrow canals, or branches of that deſcription, it will be neceſſary to provide for wider places at ſhort intervals, for barges to turn, and to lie in while others paſs them; conſiderable ſkill and care are requiſite in the choice of proper places for ſuch purpoſe: they ought to be ſo ſituate that barge-men can mutually ſee each other approaching on narrow canals or branches, and provide for paſſing, without either of them having to drag their barge back again to a paſſing-place, as too often happens; at the ſame time, they ought to be choſen, if poſſible, in ſuch hollow or low places as will admit of widening the canal without much extra expence. Another conſideration is, the excavation of baſons, docks, or wharfs, from which ſtuff may accumulate, which ought to be uſed up, if poſſible, in embanking the line juſt by. Many canal companies have ſeen it their intereſt, on proper and timely application from land-owners, who were deſirous of erecting wharfs, to direct their engineer to calculate upon, and to excavate the additional width neceſſary for ſuch purpoſe, at the company's expence; this and the extra or deeper cutting that there muſt always be, in the approach to a lock on the lower ſide, and of embanking on the ſame approach on the upper ſide, ſhould alſo be well conſidered and accurately calculated; and full and explicit memorandums ought to be entered in the engineer's field-book at the time, where the ſtuff was calculated to be had from for every embankment, and where the ſtuff is to be diſpoſed of from every deeper cutting or extraordinary excavation. Theſe memorandums will prove of the moſt important uſe in the reviſal of the whole length of line or diſtrict that is about to be fixed; as alſo, in contracting for and letting of the work afterwards, by being able, without fear of miſtake, to point out which way every part of the ſtuff is to be thrown or wheeled, as faſt as it is dug, and that no part of the ſame may want moving a ſecond time, or any wide or gouty places be made to disfigure the canal for finding ſtuff; or, what is often of more fatal conſequence, the canal being dug deeper than uſual for ſuch purpoſe.

After the line ſhall have been thus marked out with the utmoſt care, it will ſtill be prudent for the engineer to reviſe it again, and to make pretty accurate calculations of the quantity of ſtuff wanting, or to ſpare in particular places; in theſe kinds of calculations the engineer will find the moſt important aid in a ready uſe of the *ſlide-rule;* and we beg here to mention that a gentleman who has long diſtinguiſhed himſelf by the various and important uſes to which he has made the ſlide-rule ſubſervient, has prepared a ſhort but complete tract on its appplication in the concerns of an engineer, which it is hoped that he will ere long publiſh. Perhaps, on the review of the line, the curves or bends thereon may in ſome caſes be eaſed, and beauty and convenience may be more fully attained without much, or often any extra expence. The *Droitwich* canal has been mentioned as one on which theſe points have been the moſt fully attended to. The portion of the canal that has been thus ſtaked out and reviſed, may now have the boundary lines marked out of the land to be purchaſed; and the ſurveyor ſhould proceed without delay to ſurvey the ſame, and to treat with the owners for the purchaſe, as we have before mentioned. It will be among the firſt works to dig out for the foundations of the locks, if they are not already in hand, and for the bridges, if the ſeaſon of the year and ſupply of bricks and work-men will admit of their proceeding immediately: the ſeveral drains or culverts that are to paſs under the canal ſhould alſo be dug out, and prepared for the maſons or bricklayers, and the ſeveral ſafety-gates, ſtop-planks, weirs, and other erections, which we ſhall notice more particularly further on. It may be proper here to caution the engineer, that in caſe the pipes of any water-works, or that ſupply any gentleman's houſe, croſs the line of the canal, ſuch pipes ſhould be laid at once, two or three feet beneath the bottom of the intended canal, with an eaſy deſcent and aſcent therefrom, and the ground be made good again as ſoon as poſſible, both to prevent their being damaged in cutting the canal, and being expoſed to froſt, or to thieves, if of lead, by lying bare; and in caſe ſuch pipes are found old or decayed, new ones of lead or caſt iron ſhould by all means be laid in the deep part under the canal. The top-ſoil ſhould be carefully removed; and in order to determine readily and correctly the places of the ſlope-holes at E and L, *fig.* 7, and E and P, *fig.* 8, the engineer will find it uſeful to calculate the diſtances of d E and d L, and d P, by a general theorem, in terms of d h and h i, and to make tables for the ſeveral values of thoſe data, that are likely to occur. The values of d P and d A, *fig.* 7, would be alike uſeful in a table for determining the limits of the banks that are to be raiſed.

Before cutting out the lock-ſpit, or ſmall trench between the ſeveral ſlope-holes, as a guide to the men who are to dig, the engineer ought to cauſe holes to be dug in the line of the canal, near every ſecond or third level-peg, or oftener, if the ſoil be variable, in order to prove the ſoil to a greater depth by two or three feet than the cutting of the canal is to extend; and each of theſe the engineer ought carefully to inſpect, in order to determine what puddling or lining will be neceſſary; and what will be the difficulties of digging, owing to the hardneſs of the ſtuff, or to water that muſt be pumped out, &c.; all which circumſtances, as well as the extra diſtance that any part of the ſtuff may require to be moved, muſt be well conſidered before the work can be let to the contractors or hag-maſters.

The *puddling* or *lining* of a canal, to make it hold water, is a matter of the greateſt importance, and we ſhall conſider five caſes, in *figs.* 9, 10, 11, 12, and 13, that are likely to occur or preſent themſelves in the ſearch, into the ſoil that is to be dug, by ſinking holes as above mentioned: the firſt caſe we ſuppoſe to be that in which the whole is clay, loam, or other water-tight ſtuff, as ſhewn by the dark ſhading in *fig.* 9: all ſoils that will hold water, and not let it ſoak or percolate freely through them, are called water-tight. Our ſecond caſe, *fig.* 10, is that in which the whole cutting will be in ſand, gravel, looſe or open rock, or any other matters that will let water eaſily through them, and ſuch are called porous ſoils or ſtuff. The third caſe we ſuppoſe to have a thin ſtratum of water-tight ſtuff on the ſurface, ſhewn by the dark ſhading in *fig.* 11, and to have porous ſtuff for a conſiderable depth below, here diſtinguiſhed by dots. The fourth caſe may have porous ſtuff near the ſurface, and water-tight ſtuff at the bottom of the canal, as in *fig.* 12. The fifth caſe is that where water-tight ſtuff appears on the ſurface, as *fig.* 13, below this a ſtratum of porous ſtuff, but having again water-tight ſtuff at no great diſtance below the intended bottom of the canal. The new raiſed banks that are left unſhaded in all the five figures, are always to be conſidered as porous ſtuff, as indeed they will always prove at firſt, and in a great portion of ſoils they would ever remain ſo, unleſs either puddling or lining was applied; all ground that has been dug or diſturbed muſt alſo be conſidered as porous. It ſhould alſo be remarked that any kind of ſoil which is perforated much by worms or other inſects, ſhould in canal-digging be conſidered as porous ſtuff. *Puddle* is not, as ſome have attempted to deſcribe it, a kind of thin earth mortar, *ſpread* on places intended to be ſecured, and ſuffered to be *quite dry* before another coat of it is applied; but it is a maſs of earth reduced to a ſemifluid ſtate by working and chopping it about with a ſpade, while water juſt in the proper quantity is applied, until the maſs is rendered homogeneous, and ſo much condenſed, that water cannot afterwards paſs through it, or but very ſlowly. The beſt *puddling-ſtuff* is rather a lightiſh loam, with a mixture of coarſe ſand or fine gravel in it; very ſtrong clay is unfit for it, on account of the great quantity of water which it will hold, and its diſpoſition to ſhrink and crack as this eſcapes; vegetable mould or top-ſoil is very improper, on account of the roots and other matters liable to decay and leave cavities in it, but more on account of the temptation that theſe afford to worms and moles to work into it, in ſearch of their food: where puddling-ſtuff is not to be met with, containing a due mixture of ſharp ſand or rough ſmall gravel ſtones, it is not unuſual to procure ſuch to mix with the loam, to prevent moles and rats from working in it; but no ſtones larger than about the ſize of muſket bullets ought to be admitted. That the principal operation of puddling conſiſts in conſolidating the maſs is, we think, evident, from the great condenſation that takes place: it is not an uncommon caſe, where a ditch is dug, apparently in firm ſoil, that though great quantities of water are added during the operation, yet the ſoil that has been dug out will not more than two thirds fill up the ditch again, when properly worked as puddle. It ſhould ſeem alſo, that puddle is rendered by that operation capable of holding a certain proportion of water with great obſtinacy, and that it is more fit to hold than tranſmit water. It is ſo far from true, that puddle ought to be ſuffered to get quite dry, that it entirely ſpoils, when by expoſure to the air it is too much dried; and many canals which have remained unfilled with water during a ſummer, after their puddling or lining has been done, have thereby become very leaky, owing to the cracks in the puddle-ditches and linings. One of the firſt cares of an engineer, when beginning to cut a canal, is to diſcover whether good puddling-ſtuff is in plenty, and if it be not, it muſt be ſought for and carefully wheeled out or reſerved wherever any is found in the digging; or perhaps procured at conſiderable diſtances from the line, and brought to it in carts. It has happened in ſome ſtone-brach or looſe rocky ſoils, that all the puddling-ſtuff for ſeveral miles of the line, required to be brought to it; but even this expence, ſerious as it may be, ought not to induce the copying of thoſe, who have left miles of ſuch banks without any puddling, and have made a winter canal, but which no ſtream of water that is to be procured can keep full in the ſummer months. It is uſual in canal acts to inſert a clauſe for the ſecurity of the land-owners, to require the company to cauſe all the banks that need it to be ſecured by puddling, to prevent damage to the land below by leakage: and it would have been well for all parties in many inſtances, if this clauſe had been enforced. It appears that the Dutch have been in the habit of making mud-ditches to ſecure the banks of their canals and embankments, from time immemorial; and that operations ſimilar to our puddling have been long known on the continent, but it is not clear at what period it was introduced into this country; we think that the fens of Cambridgeſhire and Lincolnſhire, in which ſo many works have at different times been executed by Dutchmen, are the moſt likely places in which to ſearch for early evidence of its uſe. We cannot think that *James Brindley* was the firſt who ever uſed it in this country, although we might admit that the *Bridgewater*'s canal was the firſt in which it was ſyſtematically uſed as at the preſent day. If we compare our firſt, fourth, and fifth caſes, *figs.* 9, 12, and 13, we ſhall find in all of them a water-tight ſtratum as the baſis; and the practice in theſe caſes is to make a wall of puddle, called a puddle-ditch, or puddle-gutter, within the bank of the canal, as ſhewn in ſection, by *a c*, in the above figures; theſe puddle-gutters are uſually about three feet wide, and ſhould enter about a foot into the water-tight ſtuff, on which they are always to be begun: and they ſhould be carried up as the work proceeds to the height of the top-water line, or a few inches higher. Our ſecond and third caſes, *figs.* 10 and 11, evidently will not admit of the above mode, becauſe we have here no water-tight ſtratum on which to begin a puddle-gutter as a bottom: in theſe caſes, therefore, it is uſual to apply a lining of puddle to the ſides and bottom of the canal, as ſhewn by the croſs ſhading in *figs.* 10 and 11: the proceſs of puddling and lining will occur more properly further on, as we proceed in deſcribing the operations of digging and forming the canal.

In order to deſcribe more intelligibly the proceſs of ſetting out and digging a canal, in the two caſes where *puddling* or *lining* will be requiſite, we have repeated our firſt and ſecond caſe, but on a larger ſcale, in *figs.* 14 and 15; wherein *p* is intended to repreſent the hole that has been before ſuppoſed to be ſunk, in order to prove the ſoil; and, according as this terminates in water-tight or porous ſtuff at its bottom, that puddle-ditches, *q c ſ w* and *x c ſ t*, *fig.* 14, or a lining, *q r ſ t* H G F D, *fig.* 15, is to be applied; D H being the height to which the water is to ſtand in the canal. The engineer will in the firſt caſe determine the place of E and L on the ground, and dig ſmall holes or nicks to mark the ſame, called ſlope-holes; but in the ſecond caſe other marks muſt be made at *n* and *v* about five feet from the former, to direct the beginning of the cuttings, with allowance for the lining. A ſkilful and very handy workman is now required to mark out the line upon the ground, called the lock-ſpit, between the ſlope-holes at E, *fig.* 14, above-mentioned, which we have ſuppoſed to be made at about two or three chains from each other. This is done by laying down and ſtretching a ſtrong line upon the ground, between two or more adjoining ſlope-holes, and if the canal is not to be ſtraight in that part, with ſmall pegs to give it the gradual and regular bend in every part that the canal is to have; the workman then proceeds, holding his ſpade or grafting tool not upright, but always with the ſlope C E, that the bank of the canal is to have, and ſtrikes it ſucceſſively into the ground cloſe to his line, until the whole length of the line is marked out; by this means, if the ground has ſudden undulations, or hollows, as continually happens, owing to the ridges and furrows of cultivated lands, and other cauſes, yet a regular line coinciding in every part with E is marked out upon the ſurface; before the line is taken up, another labourer follows on the other ſide of it, and ſtrikes in his tool inclining the contrary way, by which a triangular ſod or piece of earth is cut and thrown out: a ſimilar lock-ſpit muſt be cut on the other ſide of the canal at L; and the ſame at *n* and *v* in *fig.* 15. If neatneſs and regularity are properly conſulted, lock-ſpits for the extremities of the banks at A and P will alſo be proper, eſpecially if the land A A′ and P P′ is valuable, and the damage by the ſcattering and laying of the ſtuff would be conſiderable. The engineer has now to determine, in *fig.* 14, the points *c* and *d* for the beginning of the puddle-ditches, and theſe he ought to chuſe ſuch, that if the ſame were carried upright to the top-bank, *b* C or I *a* would be about one foot: if this is not ſtrictly attended to, the labourers or navigators, as they are called, will for their own convenience begin their puddle-ditch much too near the canal at E and L in ſome caſes, and not make it upright but hatching back to arrive at *a b*; and puddle-ditches ſo made are apt, owing to the ſettling of the bank, to get broken and be ſpoiled. It may be proper here to remark, that canals ſet out with the ſcientific precautions and care that we have recommended, will always have the proper quantity of ſtuff to allow for the ſettlement of the banks, becauſe A B C E + L I K P = E F G L, in the ſame ſettled or conſolidated ſtate, that the latter part was before the digging commenced: it will, however, be proper to give the contractors a table or rule ſhewing, according to the height, as *a c*, what extra height a ſuddenly raiſed bank is required to be, to allow for ſettling: and it is evident that the ſlopes of ſuch banks muſt be ſteeper in the firſt inſtance, than they are intended ultimately to be.

We may now ſuppoſe the engineer to proceed to the letting of the cutting of certain lengths of the canal to contractors or hag-maſters, who will employ a number of navigators under them, in digging and puddling the canal. It is uſual to let the work at a certain price per cubic yard of digging, and to pay for the puddling and lining either at a certain price per cubic yard, or per yard run of the canal. The engineer ought to inform himſelf thoroughly on the difficulties and facilities which attend the work he is about to let, and to draw up a ſhort but explicit contract to be ſigned by the contractor. We cannot but recommend that all contracts for material or large jobs of work, not only in cutting, but for the maſon's, and other works in particular, ſhould be ſubmitted to the principal engineer for his approbation, before they are ſigned or finally concluded on. The prices allowed ought to be fair and liberal, according to the circumſtances, ſo that the contractor may have no pretence on account of low prices, to ſlight his work, particularly the puddling; and they ought in every inſtance to be ſtrictly looked after, and made to undo and renew immediately, any work that ſhall be found improperly performed. We recommend it to the engineer to keep a ſtrict account, by means of his overſeers or counters, of all the men's time that are employed upon the works; diſtinguiſhing particularly the number upon each work, and whether employed by the day, under the company, or upon the work that is let to contractors. Theſe particulars are moſt eſſential towards knowing, what money ought to be advanced to the contractor during the progreſs of his job, and towards informing and maturing the judgment of the engineer, in the length of time that a certain number of men will be in performing any future work that he may have to direct; and a calculation ought to be made in every inſtance of the day-work, and compared with the contract price, by which alone a correct judgment can be formed of the proper prices at which work ought afterwards to be let, ſo that the labourers may receive proper wages, proportionate to their exertions, and the contractor be amply paid for his time, ſkill, and ſuperintendance; and yet economy and the intereſt of the company be duly conſulted. Barrows and wheeling-planks, horſing-blocks, and other implements, are generally found by the company; and it is uſual to conſider 20 to 25 yards, to be a ſtage of wheeling, and a price per cubic yard to be fixed, according to the number of ſtages that ſoil is to be moved: where this diſtance exceeds 100 yards, it will not often be eligible to perform it by wheel-barrows; and runs of planks with an eaſy deſcent, if the ſame is practicable, ſhould be then laid for large two-wheeled barrows, or trucks to be uſed thereon.

The cutting of a canal being let, the work is uſually commenced by a labourer, on the part E *g*, *fig.* 14 or 15, on the lower ſide of the canal; and from the lock-ſpit at E he marks out a certain width to *g*, ſuch that he can throw or caſt the ſtuff as he digs it, on to the part A *c*, and ſo that the heap may not obſtruct the intended puddle-gutter *c d*. The ſide E F he is careful to cut down in the proper ſlope of the bank; the other ſide is uſually cut ſtraight down, and this work is continued until he comes to the bottom of the intended canal at F *h*, and this ſpace E F *h g* is called the "reaching." The ſame proceſs is followed on the lower ſide of parts that want lining, as *fig.* 15, except that *n r h g* is the reaching in this caſe, and that there is no neceſſity to throw the ſtuff further in this caſe, than that it may lie upon *n* A without rolling back into the work; and it is uſual, if the reaching will not be very deep, to lay two or three rows of ſods or ſound ſpits of earth, with regularity in the face of the ſlope *n q* to form part of the bank, and to throw the other ſtuff over theſe. Reachings are alſo to be dug on the upper ſide of the canal, as *i k* G L, or at leaſt as much ſtuff is to be thrown out therefrom as can conveniently be ſtowed upon *d* P and *v* P, *figs.* 14 and 15.

It is now time to commence the puddling in *fig.* 14, and a labourer begins by digging out the bottom of the intended puddle-ditch *c e f d*; if the ſoil dug out is good puddling-ſtuff, he lays it on the part *d* E, if otherwiſe he throws it at once on to the heap on A *c*. A careful examination of the face E F of the reaching will ſhew to what depth the puddle-ditch *d f* ought to be carried in every part, to reach and interſect any faulty places, or veins of lighter ſoil, or worm, rat, or mole-holes that may accidentally occur in the bank. After the puddle-ditch is dug clean out to its proper depth, and this is a circumſtance that the engineer or ſome careful overſeer ought always to look particularly to, about 9 or 10 inches thereof is to be filled looſely up with puddling-ſtuff, either from that which comes out, or from the neareſt heap in reſerve, all large ſtones, ſticks, ſtraws, or other extraneous matters being carefully picked out as the ſtuff is ſprinkled in: by this time, unleſs the ſeaſon is very dry, it is probable that ſome water will be collected in the bottom of the reaching F *h*, and this ſhould be laded out with a ſcoop into the puddle-ditch, ſo as to give the ſtuff therein a good wetting; if the puddling-ſtuff be of the ſtiffer kind, or was very dry, it will be right for the labourer to betake himſelf to ſome other part of the work for two or three hours, but perhaps giving his ſtuff another ſprinkling of water in the interim; he may then proceed with the puddling; and for this purpoſe he ought to be provided with a ſtout pair of puddling-boots, that will keep out water; he begins at one end of the trench, and keeps chopping with his tool into the ſtuff and quite through it, giving his tool a lunging motion every time before it is withdrawn, ſo as to let the water into and to ſtir every part of the puddling-ſtuff; if more water is wanted, another labourer is ſet to lade it out of the reaching as before; and the puddler thus proceeds, chopping down at every inch or thereabouts as he ſlowly advances, and trampling about at the ſame time as much as he can with his feet, which greatly aſſiſts the operation: when arrived at the end of the trench, he returns and repeats the ſame operation, until every part of the puddle is properly worked; which is known by the tool going equally eaſy into it in every part, which it would not do if any dry lumps remained, and the whole being in a ſemifluid ſtate; giving the puddling-ſtuff juſt the due quantity of water is very eſſential to its working well, and this, experience will ſoon point out.

Very great care and management will, in general, be required on the part of the engineer, to furniſh water for the puddling: it will often require to be brought in temporary trenches, perhaps acroſs ſeveral fields from ſome mill-dam, large pond, or ſpring of water above the canal; for which purpoſe general powers ought to be given in the act, upon condition of levelling and making all ſuch trenches good again as ſoon as poſſible, and paying for the damage; often times puddling water is not to be had without pumping it up, and conveying it conſiderable diſtances in troughs, of which great numbers will be required. It will very often be requiſite to convey the water acroſs the canal in troughs to the different puddle gutters, and plenty of treſtles ſhould be in readineſs for ſupporting theſe troughs at the requiſite heights. Conſiderable care will be neceſſary to turn off the ſurplus water, into ſome channel where it can run off without flooding the works; or to ſtop it at its ſource; this laſt ought always to be adopted, when the ſupply is not very plentiful, or the owner of the ſtream or pond might be injured by taking a conſtant ſtream from him, during the progreſs of the work. The firſt or bottom courſe of puddle being properly worked as above, it ſhould then be ſuffered to ſtand two or three days undiſturbed, and without any more water being given to it; when it will be found ſufficiently ſet that a man may ſtep on to it without ſinking in; it is then ready to receive a ſecond courſe; the firſt ſtep is to ſcrape off and remove any lumps of earth, ſtones, ſticks, or other matter which may have fallen into the puddle-ditch; about 10 inches thick of puddling ſtuff is then to be ſprinkled lightly into the ditch as before; and water is to be applied either from the reaching, or from ſome of the troughs which we have been mentioning: ſome hours time is to be allowed for the ſtuff to ſoak, unleſs it be light loam, and moiſt at the time of putting it into the ditch; in ſuch caſe, the puddling may be begun almoſt immediately: care muſt be taken that the tool be made to penetrate a ſmall diſtance into the old puddle at every chop, in order that the two courſes or layers may be properly incorporated. After this couſe is properly wetted and worked, it muſt ſtand the proper time to ſet as before, but by no means to get dry, otherwiſe it will be found full of cracks and muſt be worked anew: and in caſe, owing to any temporary ſuſpenſion of the work, it ſhould be neceſſary to leave a puddle-ditch before it is finiſhed, it ought always to be covered, and left with a dry or unworked courſe of puddling-ſtuff upon it, to keep the air from it, and preſerve the proper moiſture in it.

When a ſufficient number of courſes of puddle have been added, to fill up the ditch *c e f d*, two or three rows or courſes of ſods, or ſpits of earth, muſt be laid on each ſide, to raiſe the ditch ſo much higher; at the ſame time that the heap of ſtuff on A *c* is levelled down, and other ſtuff is brought by the men, who are wheeling from the bulk *g h k i* that is left in the middle of the canal, and laid on *d* E to back up the ſpits or ſods: after cleaning the ſurface of the puddle, if properly ſet, it will be ready to receive another courſe of puddling-ſtuff, the water muſt be turned on, it muſt have time to ſoak, if neceſſary, and then be worked and ſtand to ſet as before: other rows of ſpits of earth may then be laid, to raiſe the ſides of the puddle-ditch, and the bank may be made up to the ſame height by freſh ſtuff wheeled in from the canal; and care being taken to lay ſpits of earth to form the ſlopes A B, and E C, as the works proceed upwards, particularly the inſide ſlope C E, which ſhould be well trod and conſolidated by ſtrokes of the tool to prevent its falling down, or being diſturbed by the water when the canal is filled; another courſe of puddling-ſtuff is then to be added, and all the ſame proceſs gone through till the puddle has arrived at *q w*, the height of top-water, or an inch or two higher, which being properly ſet, the bank is to be made up, covering the puddle completely up with common ſtuff, to the intended height of the top-bank B C, with proper allowance for the ſettling; and obſerving that the puddle will not ſettle near ſo much as the other ſtuff, if at all. The proceſs is no way different, by which the other bank L I K P, and its puddle-ditch, are to be carried up, and completed to the intended height. The part of the canal, with puddle-gutters, *fig.* 14, of which we have been ſpeaking, has, in general, a lump or ridge of ſtuff remaining in the middle of its bottom, until the very laſt: a different ſyſtem ought, however, to be purſued with ſuch parts, *fig.* 15, as require to be lined; here the banks AB *q n*, and *v t* KP may be at once made up, and the whole of the ſpace *n r s v* ought to be cleared for certain diſtances, before the lining of the bottom can be begun. A great deal of management is required by the overſeer or contractor, to manage all theſe parts of their buſineſs, ſo that there is no hindrance of any part of the work, that every man is provided with ſtuff by the wheelers, when he wants it to make up his banks or to puddle, and that the parts to be lined are cleared in time. To accompliſh all theſe objects, a good part of the ſtuff cannot be wheeled directly out to the neareſt or oppoſite points of the bank, but it muſt be worked forwards and backwards obliquely, on the runs of wheeling planks by the wheelers, as occaſion may require. It may often be neceſſary to exceed one or two, or perhaps more, ſtages of wheeling, to avoid taking out the ſtuff and clamping it, by which it would require filling again, damage would, in moſt caſes, be incurred on the adjoining lands, and frequently the puddling and working of the banks would be impeded, by croſſing them to land the ſtuff.

A length of the canal that is to be *lined* being cleared, and the bottom levelled and cleaned ſmooth down to the line *r s*, a courſe of puddling-ſtuff about 10 or 12 inches in thickneſs is to be ſpread over it, with all the precautions, to extract extraneous and hurtful matters, which have been before given, and the whole is to be wetted and allowed to ſoak if neceſſary, as before: the working of this puddle is now to be begun; and as the extent will generally be large, ſeveral men may be employed, at once, upon it, ſo as to make it worth while for an overſeer employed by the company, to attend them conſtantly to ſee that no part of the work is ſlighted: as the bottom in this caſe is ſuppoſed to be ſand, looſe ruble of a rock, chalk, or other matters, that would injure the puddle if mixed therewith, we have recommended a thicker courſe at firſt than is uſual of puddling-ſtuff, and in working the ſame the men ought not to ſtrike their tools deeper or even quite ſo deep as the bottom of the puddling-ſtuff to avoid diſturbing the bottom. When this courſe of puddle has been allowed to ſet, another courſe of about nine inches is to be added, and treated as before, till about three feet of puddle is added, if the ſoil is very porous; and the top courſe being ſet, a courſe 18 inches or two feet thick of the common ſoil or ſtuff ſhould be laid evenly upon it and the bottom levelled; this covering of the bottom ſhould be rather dry, and not in large lumps, or with great ſtones or ſticks in it.

The *lining of the ſides* is now to be proceeded with as follows; the top covering of the bottom ſhould be removed for three feet in width next each of the ſloping banks; and the ſurface of the puddle be carefully cleared of dry lumps, ſtones, &c.; a thickneſs of nine inches of good puddling-ſtuff is now to be laid in this place and wetted and worked, and allowed to ſet as before directed, when another nine inches is to be added in like manner; ſome common ſtuff from the digging of the canal is then to be brought in ſpits or ſods, and carefully piled up for two feet in width, and about nine inches in height, hatching-back before and behind, agreeable to the ſlopes F E and G L, and leaving a ſpace or puddle-ditch behind, next to the ſides *r n*, and *s v*; the ſurface of the puddle at the bottom of theſe is to be carefully cleared, nine inches of puddling-ſtuff applied, wetted, worked, and allowed to ſet as before: more ſpits or ſods are then to be piled in the front, as a facing to keep up the puddle, and their interſtices ſhould be filled with fine ſtuff to make the whole ſolid; when puddling-ſtuff is again to be applied behind, and the ſame proceſs repeated till the puddle and facing arrive at *q* D and H *t*, when the remainder is to be made up with dry ſtuff and ſpits to the top-bank level at C and I, as directed in the former caſe.

The laſt of theſe ways of making a canal water-tight is the more tedious and expenſive of the two; it is however general, and may be applied in any ſituation with perfect ſucceſs. Mr. *Thomas Telford*, in *Plymley's Agricultural Report of Shropſhire*, 8vo. p. 296, when ſpeaking of the *Shropſhire* canal, ſays, "This canal, carried over high and rugged ground, along banks of ſlipping loam, over old coal-mines, and over where coal-mines and iron-ſtone are now actually worked under it, is a ſatisfactory proof that there is ſcarcely any ground ſo difficult but where, with proper exertions and care, a convenient water conveyance may always be obtained." And we have heard of inſtances of canals being conducted over ground ſo rocky, and abounding with ſuch great chaſms, and looſe pieces of rock, that many yards together of the canal bottom might have fallen in, had not the precaution been firſt taken, of removing all the ſmaller and looſe ſtones and rubbiſh, and wedging in the large looſe pieces of rock with ſtones, ſet in mortar, and thus rendering the foundation ſound, on which ſoil to fill up the inequalities, and a lining and facing was applied as above, with perfect ſucceſs. We have already obſerved, that ſome perſons have thought it right to omit puddling or lining, where ſprings appeared in the bank of a canal; and the matter is of ſo much conſequence, that we beg farther to obſerve, that the appearance or non-appearance of ſprings ought in general to have no effect in determining the propriety of theſe eſſential meaſures; if a ſpring is of any uſe to a canal it will riſe, owing to the puddle-ditch or lining, and run over the ſame into the canal, and no water will be thereby loſt; and if it will not ſo riſe, it may ſafely be ranked as a drain of the moſt miſchievous kind, inſtead of a ſupply, and therefore very eſſential to be ſtopped up.

In caſe it is found that there is ſtuff to ſpare after completing the banks, it will ſometimes be adviſable to remove the top-ſoil from A′ A in low places, and after ſpreading the extra ſtuff ſo as to make the ground good, to return and ſpread the ſoil upon it: the part P P′ will often admit of ſimilar treatment, and ſometimes ſudden hollows there may be filled up, ſo as to have a fall to the top-bank I K, and avoid a deep ditch through an adjoining ſwell or riſe of the ground at P, to carry off the rain water to a culvert where it is to paſs under the canal: where it happens that P P′ is waſte or ground of little value, or the company is poſſeſſed of a piece that they have been obliged to purchaſe and cannot readily diſpoſe of, it may be proper to make a heap or ſpoil-bank of any extra-ſtuff, to be afterwards boated away as occaſion may require. If a deficiency of ſtuff is experienced to complete the banks, the part P P′ furniſhes a good reſource in many inſtances; the top ſoil being removed on the higher parts, an excavation like P *y* P′, *fig.* 14 and 15, may, and indeed muſt in many inſtances, be made with a proper fall for conveying the rain-water that falls in every part above the canal to the brook or culvert that is to take it off; the ſlope P′ *y* ought to be ſo eaſy, and the top-ſoil ſo ſpread, that the land ſhall be as fit for agricultural purpoſes afterwards as before. Another reſource ought in an earlier ſtage of the buſineſs to be provided, in the deep-cutting, by marking out a yard or two or more width of ground to be purchaſed on the upper or deeper ſide, than is actually wanted, by which a great deal of ſtuff may be procured at a comparatively ſmall expence of land: it muſt be evident, that the reſources we have pointed out above are inadequate to receive any great redundancy, or to ſupply any great deficiencies of ſtuff, and are only ſufficient where the canal has been ſet out with ſcrupulous care; bungling, or careleſs canal-makers muſt be content to leave laſting marks of their incapacity or folly behind them, in the many ſudden bends into the hill that they are obliged to make to obtain ſtuff, and out of it to diſpoſe of the ſame in other places, with numerous wider or deeper places on the canal to make up the banks, or in enormous ſpoil-banks or uſeleſs excavations. Where a reſerve of ſtuff has been made in the deep-cuttings at ſeveral points on each level or reach of a canal, as above-mentioned, it will be the better fault of the two, to experience a deficiency of ſtuff; becauſe as ſoon as the bottom of the canal has been cleared, and the lining of the bottom and ſides for ſome height performed, or the puddle-ditches carried up, the canal may have 18 inches or 2 feet of water let into it, and dirt-boats may be uſed to carry ſtuff from the deep cuttings to make up the banks in other places; whereas all redundant or ſpare ſtuff muſt be got out before the bottom lining can be applied, or any effectual uſe made of boats to move ſtuff from place to place; and the ſame advantages will be experienced in ſituations where puddling-ſtuff is only to be procured at particular points on the line, by clearing out and completing the bottom part of the canal for conſiderable lengths, ſo that dirt-boats may be uſed to bring the ſame for the puddling or lining of the upper part of the banks, which, if there is ſpare ſtuff, cannot be effected without heavy expences in moving the ſame and forming ſpoil-banks. Where the line of a canal is to croſs an extenſive ſtratum of valuable brick earth, or one of good gravel for making of roads, it will often be adviſable, eſpecially if the line can be rendered more direct thereby, when ſetting out the canal, to cut pretty deep into ſuch materials, and even quite through the gravel, if the ſame is practicable, as might have been done at Dawley-deep, between Paddington and Uxbridge, on the *Grand-Junction* canal; for although conſiderable expence will in the firſt inſtance be incurred in digging and in damage for ſpoil-banks, yet ſuch materials, as good brick-earth and gravel, will in almoſt every inſtance find a market as ſoon as the canal is opened; ſuch a ſituation of the canal may prove of eſſential ſervice to its trade, by enabling the adjoining proprietors to work the whole thickneſs of their brick-earth, gravel, or other uſeful matters, and deſtroy but very little of the ſurface of the ground, and without being annoyed by water, but which the canal would catch in very conſiderable quantities perhaps, inſtead of loſing water by preſerving a high level through porous ſtuff. It is highly to the intereſt of a canal-company to give facility to the getting and conveyance of all uſeful articles within their diſtrict, at the cheapeſt poſſible rates, as the only means of opening new ſources of trade or manufactures, by which their concern will be in the moſt eſſential degree benefitted. In diſtricts where ſtone and gravel for making and repairing of roads are ſcarce, it will be proper to pay the labourers certain rates per cubic yard for all the ſtones or gravel that they may collect out during the work, and ſtack in proper places; as reſources for the making of the towing-path C *l*, *fig.* 15, and for making good the landing or aſcent to the ſeveral bridges, and the ſeveral pieces of new road that the engineer will have to form, near to the canal and bridges; the lock-banks and all wharfs and landing places ſhould alſo be covered with good gravel to render them ſafe and convenient for uſe: if good gravel can in places be interſected in deep-cuttings, much of the above expence, as well as of cartage, may be ſaved, by an early uſe of dirt-boats in the bottom of the canal. It cannot, we think, have failed to ſtrike every reader ere this, how very important and various the duties of the reſident engineer are; but the ſame will be much more apparent, when we ſhall have finiſhed, in the following pages, the more particular obſervations that occur to us under the heads of reſervoirs, feeders, aqueducts, embankments, culverts, ſafety-gates, weirs, tunnels, deep-cuttings, locks, ſubſtitutes for locks, inclined planes, rail-ways, bridges, towing-paths, fences, drains, boats, towing or moving boats and trams, cranes and implements, &c. of which we ſhall proceed to treat; after obſerving, that none but men of the ſtricteſt integrity and extenſive knowledge ought to be employed as reſident engineers, and that the committee and principal engineer ought not to heſitate in offering and paying ſuch men a very liberal ſalary, to engage the whole of their time; and, that too great a length of line or extent of buſineſs ſhould not be put upon ſuch a man. This is the proper ſphere, where young men or others, of knowledge and perſevering induſtry, who are coming forwards in their profeſſion, ſhould exerciſe and give ſpecimens of their abilities as engineers; and it will prove of the utmoſt importance to ſuch, as well as to a company who have an extenſive line of canal to conſtruct, to employ more than one of ſuch men at the ſame time, upon adjoining lengths of the canal; where their emulation may be excited in an honourable conteſt, as to thoſe who ſhall execute their portion of buſineſs in the moſt complete, orderly, and economical manner.

One of the firſt conſiderations relating to the *conſtruction* of *a Reſervoir* for ſupplying a canal, is the ſupply of water that is to be expected for it, and in what proportions at different times of the year: for this purpoſe we ſuppoſe the engineer to be furniſhed with an accurate ſurvey of the vale or vales that lie above the intended reſervoir, ſo as to be able to calculate exactly, how many ſquare miles and fractions of ſurface drain towards or vent their rain-water through the part intended to be embanked for the reſervoir; it will be very proper alſo to be furniſhed, if poſſible, with the exact gauge or quantity of water that has actually in former years been diſcharged by the brook or ſtream that is to be embanked; as alſo with the quantity or depth of rain which uſually falls within the drainage of the intended reſervoir. If the length of time that has elapſed, ſince the ſituation of the reſervoir has been determined on, has not allowed of careful and accurate experiments being made on theſe points, the engineer muſt aſſume them from the beſt data that the information of millers and other perſons will afford, and the printed tables, or journals of rain, kept by curious perſons in the neareſt ſimilar ſituations, muſt be conſulted: it is particularly neceſſary to attend to this laſt circumſtance, becauſe there are, we believe, inſtances of places where the annual depth of rain does not amount to a foot, and others in which it exceeds five feet; while 23 inches is about the medium depth of rain annually, at or near London. The moſt perfect method of obtaining true information on this ſubject, is to gauge the different ſprings or ſtreams, from whence the ſupplies of water are to be derived, and thus to aſcertain the exact ſurplus, after the mills are amply furniſhed. In the great conteſt about the Rochdale canal, Mr. Rennie had all the ſtreams, which could be affected by the propoſed reſervoirs, gauged for about a year. He firſt aſcertained the ſtate of theſe ſtreams at a time when the mills were amply ſupplied with water, and had proper gauges fixed upon them. The daily difference was meaſured, and the ſurplus thus aſcertained amounted in the year 1793 to ſixteen times the ordinary produce of the rivers. The evaporation that takes place, from a given ſurface of water in different places, has not yet been ſo accurately obſerved as the importance of the ſubject to canal engineers deſerves: *Mr. Bevan's* obſervations thereon, at Leighton-Buzard in Bedfordſhire, continued for five years, to the end of 1804, gave an evaporation of 22.92 inches at a medium per annum, while the depth of rain there, in the ſame period, was obſerved to average 23.28 inches; in ſome years the evaporation conſiderably exceeded the depth of rain, and in others it fell as much ſhort of it or more. On this ſubject, ſee the article EVAPORATION.

It will ſometimes happen, that the valley in which the reſervoir is to be made, has other valleys parallel to it, on one or both of its ſides, ſuch, that by beginning a ſough or ſmall tunnel above the level of the reſervoir, continuing it with a ſmall riſe through the adjoining hill, and from its further end continuing a ditch or feeder along the ſide of the hill riſing gently as it proceeds till it interſects the bottom of the vale, a brook or conſiderable ſtream of water may at times be there interſected and brought into the reſervoir; or, another caſe may happen, in which the adjoining valleys inſtead of being parallel to, proceed directly from the reſervoir valley, and yet feeders may be ſet out, ſo as to collect great quantities of rain and ſpring water, from the ſides of the hills that ſlope towards the adjoining valleys, and through which it would otherwiſe eſcape. Both theſe methods we ſaw ſucceſsfully practiſed about the year 1796, for increaſing the ſupply to the new water-meadows which the late *Duke of Bedford* had directed his agent to conſtruct near Woburn. A parallel valley, which croſſes the turnpike road at about $43\frac{1}{8}$ miles from London, has its ſtream of water diverted at that point, and through a ſhort tunnel into the Woburn vale, which it otherwiſe would not have reached for a mile or more, and at a much lower level. From the loweſt point in the ridge of high land that ſeparates the Woburn vale from one that proceeds through Potſgrave pariſh towards Leighton, a trench or feeder was begun, and carried for a mile or more along the ſide of the hill in Potſgrave, by which the rain water of 3 or 400 acres of land was brought into a reſervoir in a branch of the Woburn vale, to be reſerved for uſe.

The engineer, who has well conſidered and aſcertained all the circumſtances of the vales in or near to which his reſervoir is to be conſtructed, will be able, by help of a number of levels, carried round to where the ſurface of the water will extend at every 5, 10, 15, 20, &c. feet in depth, or oftener, if the nature of the ground requires it, to calculate to what height the head of the intended reſervoir muſt be embanked to retain all the water that his vallies can ſupply, between the times that it is fed by rains and ſprings, and required to be let off to the canal or mills, or ſuch quantity only as it may be neceſſary ſo to retain, according to the principles before laid down.

The neceſſary height of the head or embankment for a reſervoir being determined, the next ſtep will be to examine minutely the nature of the ſtrata and ſoil that are to be covered with water, and whether the whole or any part of the ſame is ſo porous as to require lining with puddle, as alſo the nature of the ſtuff which is to be uſed in forming the head or bank, as thereon will depend, in a great meaſure, the degree of ſlope which the banks ought to have; $1\frac{1}{2}$ to 2 feet baſe to one in height ſeems the uſual ſlope; but if the ſoil ſhould prove a ſlippery clay, as at the Aldenham reſervoir, belonging to the *Grand Junction* canal, a greater ſlope ſhould be given, as well as the precaution taken, of putting in frequent layers of ſand or coarſe gravel, to leſſen the tendency of ſuch ſoil to ſlip. If the reſervoir will require bottom lining, yet ſtill it will not ſometimes be right to truſt to lining for the head of the reſervoir, but to carry up a puddle-ditch in the centre of the head, becauſe if the inſide of the head ſhould happen to ſlip, the lining would be broken and diſturbed. The ſlopes being ſettled, it will be right to make a croſs ſection of the valley at the place of the centre of the head, as A C B (*Plate I. Canals, fig.* 16.) and to determine by levelling, and mark out the places of, as many perpendiculars or equidiſtant ordinates a, b, c, &c. as the width of the head and the nature of the ſides of the hills A C and

C B may require; we are next to conſider, that the ſection of the intended bank at every one of the points a, b, c, &c. will be nearly triangular, as D G F, *fig.* 17. (except wanting a ſmall triangle G H I at top) K E being equal to the ordinate *a*, *b*, *c*, &c. in every caſe; the baſe D F, or width of the head at the different places, varying according to the height K E, and according to the inclination or fall of the ground D F, compared with the horizontal lines F L and I H. A theorem for E D and E F will readily be obtained with the above data, and theſe diſtances being calculated and laid off on the ground, ſo many points for the bottom of the ſlopes will be determined, and a careful workman will find no difficulty, by pegging down his line and holding his grafting-tool in the inclining poſition H D and I F, (as before mentioned reſpecting marking out the canal) to mark out a lock-ſpit, as a boundary or baſe for the intended embankment.

If the ſeveral triangular ſections D G F are taken near enough to each other, A *a*, *a b*, *b c*, &c. and are carefully calculated (for which purpoſe in very large works, tables framed from the theorem will be found the readieſt way), by deducting a triangular priſm, whoſe baſe is H G I, and length A B, *figs.* 16 and 17, the ſolid contents of the required bank will be very exactly obtained; and the moſt eligible ſpots for obtaining that quantity of ſtuff, as near as may be, without endangering the ſlipping or ſtability of the bank, may be marked out; and the work will then be in a ſtate to be let to the contractors who are to execute it. But before this is begun, it will be neceſſary to provide for the eſcape of the ſurplus water when the reſervoir ſhall be full, as alſo for letting out the water for uſe; for theſe purpoſes an arch of brick-work, or of ſtone, may be begun at the lower limit of the bank in the loweſt ground or brook courſe, as at D, in *fig.* 18, and continuing the ſame on a level to a point M, ſome diſtance within the head D H I E of the reſervoir; D′ L′ being the loweſt ground or longitudinal ſection of the valley. This arch ſhould be high enough for a plank to be ſupported and fixed on irons or bearers acroſs it, about a foot from its bottom, on which a man can conveniently walk along; and, for this purpoſe, the arch had better be made elliptical, or higher than it is wide; a ſecure iron gate ſhould alſo be provided, to be kept locked at a few yards into the arch from D, for excluding improper perſons. At the termination of the level arch at M, there ſhould be a circular well of 6 or 8 feet diameter more or leſs, according to the greatneſs of the floods that may be expected, to be ſunk 6 or 7 feet deeper than the arch D M; its bottom ſhould be formed either of one very large flat ſtone, or of a few well jointed ones laid on a courſe of puddle, and on this the ſteining of the well ſhould be begun, with bricks of the very beſt quality, well keyed up and embedded in cement; and having a courſe of puddle of 9 inches or a foot thick, worked all round behind them, allowing the ſame to ſet as the work advances in height; this well, and the arch D M, are to be ſecurely groined into each other at M; near to this groin, or within reach of a man ſtanding on the end of the plank above mentioned, which ſhould not advance quite up to the well, ſhould be a large braſs cock worked into the walling; the mouth of this cock ſhould be turned down, ſo as to diſcharge its ſtream of water exactly in the direction for the centre of the bottom of the well; and from the cock ſhould proceed a large pipe of lead or caſt iron behind the wall of the well at ſome diſtance, for which purpoſe it will require a conſiderable bend, and this pipe ſhould proceed, ſoundly embedded in good puddle, towards a convenient place as S, in the bottom of the reſervoir, where it ſhould terminate under a large and ſtout box full of holes, or a fine grating, to prevent the entrance of fiſh or any thing that might choak the pipe or cock. In conſtructing the arch before mentioned, after it has proceeded from D as far as the intended puddle-ditch *c d*; the puddle-ditch ſhould be dug out for ſome diſtance on each ſide acroſs the arch; the ſame ſhould be continued down to water-tight ſtuff, or at leaſt for ſome depth into other matter, if unfortunately ſuch is not within reach; and, when the puddle is carried up and ſet, as alſo a courſe of puddle in the bottom of the arch courſe *d* M, which ſhould have been dug deeper for ſuch purpoſe; the bottom of the remainder *d* M of the arch ſhould be carefully laid on the puddle, and a centering for the arch is to be laid on the ſame and firmly ſecured down; this precaution being neceſſary to prevent the ſemifluid puddle that is to be applied ſucceſſively withoutſide the arch, as it is carried up, from floating or burying up the centering along with the lower part of the arch. The work is thus to proceed until the part of the arch *d* M is completed, and incloſed completely in a caſe of good puddle, thoroughly and completely joined at one end into the puddle-ditch *a e f b*, and into the puddle that ſurrounds the well N M at the other. When the well-ſteining has been carried up to M, it will be neceſſary to increaſe the thickneſs of the puddle-wall round it, to three feet or more, taking care that the extra width is firmly bedded upon undiſturbed and ſolid earth. The well is intended to be carried up in the ſame manner, ſurrounded by puddle, and by a conical embankment of earth O P Q R, to within two feet of the height of the bank H I, leaving a channel of ſeveral yards wide, and of conſiderable depth, I O P, between it and the bank or head D H I E. It will be neceſſary for the engineer to calculate and mark out the baſe of this conical embankment upon the ground, with allowance for ample ſlopes to prevent ſlipping or its waſhing down by the waves: it will alſo be proper, for enſuring ſtability to the work, to reduce the whole of the top of the work to one level as K L, as ſoon as can be, by ſucceſſive layers of ſtuff thereon, and of puddle in the ditch *a e f b*, and round the well N M: and, if the bottom of the reſervoir will require lining, owing to the poroſity of the ſoil; it will be right, after levelling and treading the part *b* R perfectly, to cover the ſame with 3 or 4 courſes or linings of puddle, joining the ſame perfectly with the puddle-ditch, and the puddle round the well, to which courſes of puddle the bottom lining is afterwards to be carefully joined; and after this is properly ſet, the remainder of the bank L H I E, and of the cone O P Q R, may be proceeded with, as we have before mentioned, when treating of the rearing of canal banks with puddle-ditches in them. The bank or head being completed to H I, and the well N M, and conical embankment O P Q R, being alſo carried up to the proper height, the well ſhould then be coped with a layer of the beſt hewn ſtones cramped together, and the top reduced to a perfect level; and for ſecurity, it will be right to pave the ſurface of the top P Q, and for ſome diſtance down the ſides of the conical embankment, with paving ſtones pretty well jointed, and ſet their longeſt way into the ſoil, filling their joints with mould, and ſowing graſs-ſeeds therein, to prevent the waves from afterwards looſening the ſtones or wearing the bank; this conical bank is for enabling the water to fall into the well on all ſides; if the well was made in a corner of the reſervoir, much digging would be required, both for the arch or pipe to let out the water, and for the diſcharging arch D M.

We have been thus particular in deſcribing the circular weir or well-fall above recommended, from having ſeen the beneficial effects of one, in the reſervoir for Worſley mills near the duke of *Bridgewater's* canal; and the miſchief that is ſometimes done to the banks of a reſervoir and the adjoining lands, by letting off the flood-waters by common weirs or tumbling bays at the corners of the reſervoir, and ſuffering it to find or rather tear its own way down into the valley. Reſervoirs conſtructed on the above principles would be ſecure almoſt from accident, however high the embankment, or ſudden and copious the floods, if the well is but made ſufficiently large, and deep of water at the bottom, to receive the ſhock of the deſcending column of water. If the floods are ſo conſiderable as to bring down timber and other large floating matters, it will be neceſſary to fix a ſtrong grating or circle of bars round the top edge of the well bank P Q. It will ſometimes happen, that a reſervoir is over or near to the navigable tunnel of a canal, and might be let down into the ſame by a pipe and cock as at Ripley on the *Cromford*, and near Braunſton on the *Grand Junction*. It will be proper, that the core or plug of the cock to a reſervoir ſhould be turned by an endleſs ſcrew, or by toothed wheels, ſo that conſiderable power and nicety in the adjuſtment of the ſtream let out, by the turning of the cock, may be attained; and a regiſter ſhould be provided of the number of turns, and fractions of a turn, that is given to the winch or handle in any caſe. It will be proper to flanch on a ſmall pipe to the large one, and connect the ſame with an inverted glaſs ſyphon filled with mercury, in the arch near the well, ſo that by turning a cock, the height of the mercury ſhould indicate on a ſcale attached, what depth of water there is in the reſervoir above, or how much it wants of being full at the time. A ſeries of accurate experiments ſhould be made, by gauging the ſtream of water at D, or at the firſt convenient place below it, which the cock diſcharges per hour or day, when the water is at different heights in the reſervoir, and with different turns of the cock-geer; theſe ſhould all be repeated, and ſufficiently numerous, to enable the engineer by interpolation, to fill up and form a table, (that the committee ought carefully to preſerve copies of) by which at any given height of mercury, the cock can readily be ſet to diſcharge any number of locks full of water that may be required per day. No great difficulty would attend the forming of a gauge-puddle, inſtead of, or by the ſide of the braſs cock that ſhould regulate itſelf, and diſcharge any regular and conſtant quantity of water that the reſervoir could ſupply: ſee *Leybourn's Repoſitory*, 8vo. queſtion 81, p. 165. It will be right alſo for the engineer and committee, to have tables for readily ſhewing the quantity of water that every reſervoir contains, at each foot or ſhorter portion of its depth, indicated by the mercury in the ſyphon, or by a graduated gauge-poſt fixed up in any part; for forming a table of this ſort, where a complete ſurvey had not been made or preſerved at firſt, the time of a hard froſt ſhould be choſen, and a ſufficient number of holes at equal diſtances, in a great number of parallel or equidiſtant lines, ſhould be bored or cut through the ice ſufficiently large to let down a plummet to ſound the depth, and if this is done with care when the reſervoir is full or nearly ſo, a moſt correct table of its content at different depths, can be thus obtained by calculation. Some of the conſiderable reſervoirs that have been conſtructed for canals are, at Aldenham, Daventry, and Wilſtone on the *Grand Junction*; Kilſyth on the *Forth and Clyde*; Branſtone, and Denton on the *Grantham*; Ripley on the *Cromford*; Amſworth on the *Nottingham*; Littleborough on the *Rochdale*; Marſden on the *Huddersfield*; Oxendon on *Leiceſterſhire and Northamptonſhire Union*; in Rudyerd vale near Leek, for ſupplying the Caldon branch of the *Trent and Merſey* canal, which covers 160 acres, has its head 30 feet high, and the water in general very deep. St. Ferriol's reſervoir, conſtructed about the year 1670, on the canal of *Languedoc* in the ſouth of France, occupies a ſpace of 595 acres, its banks are walled round with free ſtone, and its waters let out when wanted, by a large pipe and cock.

In *conſtructing Feeders* or channels to convey water to a canal from ſprings, brooks, or reſervoirs above its level, the ſame care muſt be taken to examine the nature of the ſoil in every part, and to apply a lining of puddle, as have before been mentioned reſpecting the line of a canal, wherever porous ſtuff is to be cut through. Where there are a great number of undulations in the ground, through which a feeder is to be conducted, that would occaſion it to be very crooked and much impede the cultivation of the land, it will be proper, in many inſtances, eſpecially if the land be valuable, to cover over the feeder in a culvert or ſmall arch of bricks, of 18 inches or 2 feet diameter, or larger if the ſupply ſhall at any time require the ſame: in very porous ſoils, theſe culverts, incloſed in puddle, will be the moſt effectual way of preſerving and conducting ſmall ſtreams of water, and no land will thus be loſt to cultivation. In ſome places, feeders will require conſiderable embankments and aqueducts, to croſs valleys and ſtreams of water, and preſerve their level, or gradual and ſmall fall; and in many of ſuch caſes it will be cheaper and better to uſe caſt iron-pipes well jointed and flanched, and laid within the ground, down one ſide or bank of the vale to be paſſed, and up the other, ſecuring each end carefully with a ſtrong box full of holes, or a fine grating to keep extraneous matters out of the pipe. In the caſe of ſmaller feeders, particularly thoſe temporary ones, which are required to ſupply water to puddle with, and to fill the bottom of the canal for the temporary uſe of dirt-boats while making it, as before mentioned, elm-pipes in ſhort lengths, in which the moſt crooked arms of large trees will come into uſe, may be advantageouſly uſed in croſſing hollow roads, or other ſudden ravines, if the ſame be jointed by ſhort hollow double cones of caſt iron as recommended by Mr. *Hornblower*: ſee *Repertory*, vol. x. p. 25. It has often happened, where reſervoirs are ſituate at ſome diſtance above a canal, and a brook-courſe led from the reſervoir to the canal, that the water was left to take its ancient courſe on being let out of the reſervoir; an expert engineer will, however, carefully examine all ſuch feeders, for thus they ought to be conſidered, and fill up all deep holes, and lower the ſhallows in the brook-courſe, ſo as to reduce the channel nearly to an uniform width and depth; and very accurate gauges of the water ought to be made at different ſeaſons of the year, of the quantity iſſuing out of the reſervoir arch, and the quantity received into the canal; if theſe differ materially, intermediate and comparative gauges ſhould be made of the ſtream, until the faulty or leaky ground is diſcovered, probably ſome ſtratum of ſand or open-jointed rock; over which the brook-courſe or feeder ought to be carefully lined with puddle; and, if puddling-ſtuff be ſcarce, the ſoil very porous, and the brook-courſe very crooked, it may be the moſt effectual way, as well as the cheapeſt in the end, to paſs ſuch leaky ground by a ſmall culvert, incloſed in puddle under ground, by the ſide of the brook-courſe, as ſtraight as the courſe of the valley will admit. Except in ſituations, where mills in the vicinity of an intended canal are much in want of water, or their owners or others diſpoſed to thwart the ſcheme, it has been uſual to allow the company to ſearch for, and divert to their uſe all ſprings of water, within certain limits on each ſide of their line; in the acts for the *Newcaſtle underline Junction*, the *Southampton and Saliſbury*, and the upper part of the *Tamer Manure* canals, this limit is fixed at 1000 yards; in the *Aberdeen*, *Polbrook*, *Tamar Manure* lower part, *Thames and Medway*, *Wilts and Berks*, and others, this is fixed at 2000 yards on each ſide of the line. In ſuch caſes, an accurate inveſtigation and knowledge of the *Strata*, upon Mr. *Smith's* principles, will be of the moſt eſſential importance, in order to collect and retain ſprings that are above the ſummit level, or even in lower ſituations, where a local trade is to be provided for. It has been uſual in ſome mining diſtricts to require, that engines near an intended canal ſhould lift their mine-water into ſuch canal, or high enough to be conducted into it by a feeder, as on the *Birmingham and Fazeley* canal. It will be worth conſidering, on a ſummit, where water is ſcarce, whether a tunnel may not be more eligible than deep-cutting, on account of large ſprings which would be interſected by the lower level of the former, when the deep-cutting muſt perhaps be in porous ſtuff, or perhaps in dry open rock. As the ſummit pounds or levels of moſt canals are in deep cutting, through a conſiderable portion of their lengths, it is often attended with but little additional expence, except in the caſe of tunnels, to make ſuch ſummits pounds one or two feet deeper in water than uſual, as on the *Derby*, *Cromford*, *Mancheſter Aſhton and Oldham*, *Oxford*, and other canals, in order that ſuch additional depth, being filled in winter-time or wet ſeaſons, may act as a reſervoir for drier ones; but it has not always been conſidered, that ſuch deeper pounds, when filled 18 inches or 2 feet fuller than is neceſſary, occaſion the neceſſity of letting off twice that extra depth of water, over the area of a lock, each time that a veſſel paſſes the ſummit; by which, ſuch reſerve of water is in a great meaſure diſſipated before the dry ſeaſon for which it was intended arrives. We ſhould recommend, either the uſe of reſervoirs, ſo much above the ſummit level of the canal, that they could be emptied into the ſame, when the continuance of dry weather required it; or, if ſuch deeper ſummit pounds be made, on account of their conſiderable length for holding water, that a lock capable of penning 18 inches or 2 feet, and of ſhutting very tight, ſhould in ſuch caſe be built, near each end of the ſummit, to be uſed as long as the ſummit water is higher than uſual, but which might at other times be left open, when the water was level on each ſide of them. Before we quit the ſubject of ſupplying a canal with water, we beg to mention, that it may be worth the while of the engineer, where water is to be pumped up to ſupply the lockage, as we have before mentioned, to deſign and calculate the expence of wind-machines, capable of doing the required work, and of the probable expence of their repair; and to compare the ſame, with the coſt of erection, expence in fuel, attendance and repairs, of well conſtructed ſteam-engines to do the ſame work.

On the *erection of Aqueducts* for conveying a canal over any very deep and wide valley, or over a large or navigable river, we beg to mention, that a moſt ſecure foundation muſt be ſought for, by ſinking, or obtained by piling, for the piers of an aqueduct-bridge, and that the arches ought, in every caſe, to be arches of *equilibrium*, becauſe the leaſt ſettling in brick or ſtone bridges, by letting through the water, may prove of the moſt fatal conſequence. That the plan of an aqueduct-bridge ſhould be curving inwards, that is, the ends ſhould be wider than the middle, the walls ſhould alſo not be upright, but buttering or diminiſhing upwards withoutſide, to give greater ſtrength and ſtability to the whole; the materials, if of ſtone or brick, and the cement, ſhould be of the very beſt quality, and the work executed in the ſummer ſeaſon only. In *Plate II. Canals*, *figs*. 19, 20, and 21, we have given a plan, ſection, and elevation of an aqueduct-bridge, proper for croſſing a conſiderable river, where, in *fig*. 19, A is the river, B the canal, C the towing-path, and D D the wing-walls, for keeping up the embankments at each end of the bridge: in *fig*. 20, C is the towing path, and *a a* a lining of puddle to ſecure the canal B from leaking. Care ſhould be taken that all the joints of brick or ſtone are worked as cloſe as poſſible in an aqueduct-bridge, and thoroughly filled with cement; the ſlopes within ſide, and the bottom for the canal, ſhould be made rough, that the puddle may the better adhere to them, and that the puddle may not ſlip, owing to the ſteepneſs of the ſides, which muſt be more ſo than in other parts of the canal, to avoid unneceſſary expence of maſonry or brick-work in the width of the bridge. The lining as above is, however, liable to be ſoon cut away by the barges. Since the year 1795, a new kind of aqueducts has been introduced into this country, compoſed partly of caſt-iron, which promiſes the greateſt advantages, except, perhaps, where free-ſtone of an excellent and durable quality is found upon or very near to the ſpot, or where the ſame is very diſtant from any iron mines, or exiſting navigations that connect with ſuch. In the year 1797, Mr. *Thomas Telford*, the engineer, wrote an account of the inland navigation of the county of Salop, which has ſince been printed in J. Plymley's Report to the Board of Agriculture, on the Agriculture of Shropſhire, and we beg to extract therefrom what he ſays on this ſubject when ſpeaking of the *Shrewſbury* canal, p. 299, as follows: "This canal paſſes over the valley of Tern, at Long, for a diſtance of 62 yards, upon an aqueduct made all of caſt iron, excepting only the nuts and ſcrews, which are of wrought iron; and I believe this to be the firſt aqueduct for the purpoſes of a navigable canal which has ever been compoſed with this metal. It has completely anſwered the intention, although it was foretold by ſome, that the effects of the different degrees of heat and cold would be ſuch as to cauſe expanſion and contraction of the metal, which not being equal to extend or draw back the whole maſs of the aqueduct, would operate upon the ſeparate plates of iron ſo as to tear off the flanches which connect the plates lengthwiſe, and break the joints. Others ſaid, that the expanſion of freezing water would burſt the ſides, and ſo break off the flanches which connect the ſides with the bottom plates: but after the trial of a ſummer heat, and the very ſevere froſt of the winter of 1796, no viſible alteration has taken place, and no water paſſes through any of the ſide or bottom joints. After the froſt had continued very ſevere for three or four days, and the water had not been drawn off (although there are means of doing ſo), but it had ſtood in the aqueduct above the height of two feet ſix inches, the ice had then frozen to the thickneſs of an inch and a half, but inſtead of having forced out the ſides, it was melted away from them, and quite looſe upon the ſurface of the water. The idea of having this aqueduct made of caſt iron was firſt ſuggeſted and recommended by *Thomas Eyton* eſq. then chairman of the committee: after due conſideration, it was approved by the committee, and the principles of conſtruction, and the manner in which it ſhould be executed were referred to Mr. *William Reynolds*, and the writer of this article, (Mr. *Telford*) who, after ſeveral conſultations, and forming and conſidering various plans, at laſt determined upon that which is repreſented by the annexed engraving, (*Plate III. Canals*, *fig*. 22.)

"The caſtings for the aqueduct were done at Ketley, and were removed to Long, a diſtance of five miles, partly by land and partly by water-carriage. This aqueduct was propoſed in conſequence of the great floods which happened in the beginning of the year 1795, and it was fixed up complete in March 1796." Mr. *Robert Fulton*, an American engineer, who happened to be in this country at the time, ſeems to have availed himſelf of what was going on at Long aqueduct as above, and of the machinery of various kinds, in uſe upon the *Ketley* and *Shropſhire* canals, and to have prepared drawings and models of a variety of ſuch machinery, with many improvements of his own, and ſubmitted the ſame to the examination of a committee of the Board of Agriculture, in March 1796. Theſe have ſince been publiſhed in a handſome quarto volume, entitled, *A Treatiſe on the Improvement of Canal Navigation, by R. Fulton*, from which, p. 114, we beg to extract what he ſays on conſtructing aqueducts of caſt-iron for a narrow canal as follows: "The butments and piers being raiſed, it will only be neceſſary to extend two pieces of timber acroſs the ſpan; each to be braced back to the piers, and covered with plank to form a ſtage or ſcaffolding which will anſwer every purpoſe of centres neceſſary to works of ſtone. The iron-work, as in the ſection (*Plate* III. *Canals*, *fig.* 23 *and* 24.) may all be caſt in open ſand, and of the following dimenſions: ſuppoſing the ſpan 100 feet and the ſpring one-ſixth of the ſpan. Firſt, three ſegments of a circle, each in three pieces, about 36 feet long, eight inches by four diameter, to be united, as at A. Second, three ſtraight bars, to extend from one pier to the other, to be of the above diameters, may alſo be caſt in three pieces, which bars are to extend along the top of the ſegments to the piers, and form a line parallel to the horizon; the bars and ſegments to be united by perpendicular ſtirrups like B, ten or fifteen feet diſtant from each other. The mortice in the lower end of the ſtirrup being thirteen inches long, will be ſufficient to ſecure the ſegment, and leave room for a hole two inches ſquare, through which a croſs brace, C, is to paſs, and faſten the ſegments at proper diſtances; the brace to have a mortice caſt on each ſide of the ſtirrup, in order to tighten the work by wedges. On the top of the ſtirrup, the ſquare hole to receive the croſs brace may be beneath the mortices, as in the figure; by which means the whole may be combined, and form an iron ſtage to ſupport the troughs. The trough plates ſhould be at leaſt one inch thick, the ſide plates ſix feet broad, and as great a length as can conveniently be caſt; which may be performed twelve feet, and perhaps more in length: the flange to be outſide on theſe plates. The bottom plates may be ſix feet wide, thirteen feet long, ſeven feet plate, and four arms projecting, each three feet long, in order to ſupport the horſe-path and braces, as exhibited at D. Two of theſe plates laid acroſs the ſtage, and ſcrewed together, with a flange under, will compoſe a length equal to one of the ſide plates, which may either meet or break joint as is thought proper. The whole may, in this manner, be ſcrewed together, on packing of wool and tar, and have the ſeams pitched like thoſe of a ſhip. On the plates compoſing one ſide of the trough, ſmall brackets, about three feet from the top, muſt be caſt, as at E, in order to ſupport the horſe-path; perpendicular rails, eight feet long, being raiſed from the arms of the bottom plates, will ſupport the outſide of the horſe-path, alſo the iron railing, as in the ſection. By this mode, two patterns will anſwer for the whole of the trough-plates, and but few will be required for the ſprings, rails, and ſpurs; while the ſaving in time and expence will be conſiderable; particularly where it is neceſſary to bring the ſtone by long land carriage; for the arches being diſpenſed with, and the piers not more than one third of the dimenſions neceſſary to an aqueduct of ſtone, will moſt materially reduce the quantity of maſonry." "In aqueducts of ſtone, one of the great difficulties is to line and puddle ſo tight as to prevent the water penetrating into and injuring the maſonry; but in one of iron, ſhould a leak take place it will inſtantly appear; and on ſhutting the ſtop-gates at each end, and diſcharging the water, it may be ſtopped in a few hours, if not minutes: this circumſtance in aqueducts is, perhaps, one of the greateſt preſervatives; they are conſequently leſs liable to injury, and only ſubject to the corroding tooth of time."

Since the above period, a moſt ſtupendous work of this kind has been undertaken by Mr. *Jeſſop*, on the *Elleſmere* canal, and is now nearly or quite completed, for croſſing the Dee river at Ponteyſyltee, about 20 miles S.W. of Cheſter; where nineteen maſſive conical pillars of ſtone, at fifty-two feet from each other, the middlemoſt of which is no leſs than 126 feet in height, ſupport between the top of every pair, a number of elliptical caſt-iron ribs, which by means of uprights and horizontal bars, ſupport a caſt-iron aqueduct about 329 yards long, 20 feet wide, and ſix in depth, compoſed of maſſive ſheets of caſt-iron, cemented and riveted together, having on its ſouth ſide an iron platform and railing for the towing-path. In May 1796 Mr. *James Jordan* took out a patent for ſuſpending aqueducts from ribs of caſt-iron above them, in the ſame manner as his ſuſpended iron bridges. See *Repertory*, vol. vi. p. 230. Among the moſt conſiderable aqueducts of ſtone or brick are thoſe at Lancaſter on the *Lancaſter* canal, for a deſcription of which ſee our article BRIDGE. At Kirkintolluch and at Kelvin on the *Forth and Clyde*, Chirk on the *Elleſmere*, Marple on the *Mancheſter Aſhton and Oldham*, Monk-bridge on the *Trent and Merſey*, Whaley-bridge on the *Peak Foreſt*, Avoncliff and Dundas on the *Kennet and Avon*, &c. while at Burton on *Bridgewater*'s, a navigable river is paſſed, and near Wigan on the *Leeds and Liverpool*, another canal (the *Lancaſter*) is paſſed upon aqueducts. It was thought a bold and viſionary ſcheme by many, which Mr. *James Brindley* propoſed, of croſſing the *Merſey* river at Runcorn Gap, by an aqueduct bridge, but no doubt he could have accompliſhed it.

The *making of Embankments* appears to have been long practiſed in China, where we read of parts of their canals of 200 feet wide, that are embanked 20 feet high, for great lengths together; the rivers through the fens of Cambridge and Lincolnſhire in this country, have alſo been long confined thus, by artificial banks. Moſt of the aqueducts of which we have been ſpeaking above, have leſs or greater lengths of ſolid mounds or embankments for forming the canal upon, to the proper height, and for joining them to the aqueduct bridges; all the obſervations and remarks which we have made, reſpecting the ſetting out and aſcertaining the dimenſions of the head of a reſervoir, will apply to embankments; except that a priſm whoſe baſe is the figure G H L M N O I, *Plate* IV. *of Canals*, *fig.* 25, and length A B, *fig.* 16. *Plate* I. is to be deducted from the triangular embankment D G F, firſt to be calculated, inſtead of the triangular priſm G H I. The angle of the ſlopes ought to be determined by the reſult of ſimilar inquiries, and the ſame precautions uſed to prevent ſlips, in ſoils that are ſo diſpoſed, as were mentioned reſpecting reſervoir heads; it will generally be a ſafer way to carry up a puddle-ditch in each bank of the canal, as *a e*, *b f*, *fig.* 25, than to truſt only to lining of the canal L M N O. In every conſiderable embankment there will be required one or more arches to convey a brook or river under the canal, and, perhaps, others for roads to paſs through; ſuch arches ſhould always have an inverted arch turned below them, deep enough for the bottom of the brook, and below the roads, and the arch itſelf ſhould be one of *equilibration*. To avoid making a very large arch for a brook or ſmall river, it is uſual to make a road or communication arch near it, with its bottom well paved, and no higher than the ſurface of the meadows, which will ſerve to vent the ſudden flood in rainy ſeaſons.

Great care ſhould be taken to ſlope off and finiſh the ends of arches under an embankment, agreeable to the ſlopes or ſides of the banks thereof; by which the banks are prevented from mouldering down into the brook or road-way, and awkward projections in the ſlopes of the banks are avoided: at the entrance or upper ſide of a water-arch, or of road-arches that will occaſionally become ſuch, return or wing-walls of brickwork or ſtone ſhould be made, for ſome diſtance along the bottom of the ſlope of the embankment, and the ſharp corners of the entrance of the arch ſhould be a little rounded off, to prevent the rapidity of ſudden floods from wearing or injuring the bank. It is to be obſerved, in conducting a canal along the ſide of a ſteep and high hill, as *Plate* I. *fig.* 3, that after a certain degree of ſteepneſs of the ground A′ P′, it will not be poſſible to cut the canal, upon the principle that the excavation E F G I K P ſhall juſt form the bank A B C E, but ſuch banks will often require ſtuff to be provided from other places, and ſuch are indeed caſes of embankment: and here it may be proper to adviſe, that new banks, as A B C E, ought not to be placed on very ſteep ground, as A E, without conſiderable care in firſt forming it into levels like ſteps, to prevent the ſlipping of the new part, as happened near Bradford on the *Kennet and Avon* canal, after all the care that was taken, and great lengths of the canal banks ſlid down into the *Avon* river below, the making of which good again coſt, we were told, near 1000l. Among the conſiderable embankments that have been made for canals, are thoſe at Bollin and Stretford on *Bridgewater*'s, and Wolverton, Weedon, and Bugbrook on the *Grand Junction*, &c. but the greateſt extent of high embankment known, is that in the valley of the Boyne, in the *Grand* canal of Ireland; and the higheſt bank in the world is alſo to be found on the ſame canal in the valley of the River Rye; it is above 90 feet high. We are told, that Mr. *James Brindley* uſed a kind of caiſſon of planks, in forming his great embankments, in which dirt boats were uſed, to bring ſtuff from the higher ground, that had been cut through.

We have next to ſpeak of *Safety-gates*, *Stop-gates*, and *Stop-planks*, which are different contrivances for ſtopping the water of a canal in caſe the banks are failing in any part, or that any part wants emptying to repair the works. Advantage is generally taken of the walls under the bridges, for conſtructing theſe contrivances, where the ſame happen in the proper places; otherwiſe the canal muſt be contracted by upright walls, the ſame as is done at the bridges on purpoſe for them. For explaining the nature of ſafety-gates, we muſt have recourſe to *fig.* 26, where A B is ſuppoſed to repreſent the top of the wall, or height of the towing-path under a bridge, C D the ſurface of the water, and Q S the bottom of the canal; E F G H is a pier of hewn ſtones, or a piece of ſound oak timber let into the wall, its face being fluſh therewith; I E G and H F K are receſſes about two inches deep in the wall; ſimilar proviſion is made in the oppoſite wall, for receiving doors or gates L M and N O acroſs the canal, turning on centres or hollow-quoins at M and N: each gate is ſo balanced by a counter weight, that they reſt always in the poſition repreſented: and they are intended to operate thus, ſuppoſe, owing to the ſudden breaking of a bank, the water in the canal ſhould acquire a current from Q towards S, the ſtream would paſs under the gate at P L, to facilitate which, the corner of the floor at P is ſloped off; the gate would be turned up into the poſition M E, and the canal would be thereby cloſed up. The like would happen by the other gate N O, in caſe of a current the contrary way. Safety-gates ſhould be placed at proper diſtances on every long level or pond of water, eſpecially if the ſame is much embanked; both to prevent the loſs of ſo much water, in caſe of a bank breaking, and the miſchief that the ſame would do to the lands, mills, &c. below the breach. We read of a new bank breaking on the *Warwick and Birmingham* canal, and deſtroying a gentleman's park-walls; and in the year 1783 ſo great a breach ſuddenly happened on *Bridgewater*'s canal, near London bridge on the Cheſter road, that three barges were carried through the ſame a great way out into the fields. A ſingle ſafety-gate ought to be placed at the end of every long embankment, to ſtop the water in caſe of a breach happening in its banks. *Stop gates* are ſimilar in their conſtruction to the ſafety-gates above deſcribed, except that the gate lies flat on the bottom of the canal inſtead of being balanced, and has a chain by which it can be hauled up, whenever occaſion may require the canal to be ſtopped. *Stop-planks* are a ſimple, though not ſo expeditious a proviſion for ſtopping a canal as the laſt; a groove is provided in the two oppoſite walls under a bridge, or in a narrow and walled place, and a ſufficient number of well jointed planks are provided, to be dropped into the groove whenever the water is required to be ſtopped, and hence theſe are often called drop-planks. In very large works like the *London docks*, a barge or veſſel is built in the place, whoſe head and ſtern poſts exactly fit into a groove as above, and the veſſel can be floated into and out of its place, or ſunk therein as occaſion may require. The engineer will alſo have to make proviſion, while the canal is digging, for *ſtop-bars* at the ſeveral intended toll-houſes, or other places where it may be neceſſary to ſtop barges in the night, or in caſe of any diſpute about their lading: theſe bars are compoſed of a large baulk of fir timber floating on the water; and a ſmall arch capable of containing ſuch a floating beam of the proper length is provided under the bank, ſo that when the trade on the canal is required to be ſtopped, the toll-clerk has only to draw out the beam by means of a cord attached to it, until its end enters a receſs in the oppoſite wall, and then to lock the beam faſt.

We ſhall next deſcribe the *Waſte-gates*, *Trunks*, *Tumbling-bays*, or *Weirs*, that muſt be provided, for letting off the ſufluous water of a canal in wet times, for keeping the water to one certain height, or drawing it off in caſe any repairs may be wanting. *Waſte-gates* are ſluices of the common conſtruction in the ſide of a canal, where any conſiderable quantity of water is required to be let out, and are to be drawn up, either by a rack and pinion, a chain and roller, or a number of holes for a crow-bar, as circumſtances may render moſt eligible: where leſſer quantities of water are to be let out, or for emptying certain lengths of the canal between the ſtop-gates or planks, when occaſion may require; *trunks* formed of oak or elm planks, well jointed, ſhould be laid into the bank, at the bottom of the canal, and carefully incloſed in puddle, with a valve or ſhuttle that will ſhut very tight, and can be readily drawn when the water is required to be let off: we beg to recommend, wherever wooden trunks are uſed for any ſuch purpoſe, that they ſhould be ſunk ſo low, or the mouth where they diſcharge ſhould be made up, ſo that the trunk may always remain quite full of water, and the air be at all times excluded; in which ſituation wood will laſt much longer than if wet and dry alternately.

In the choice of ſituations for *weirs*, to diſcharge the ſurplus water of a canal, care muſt be taken not to let off any conſiderable quantity at any time, but into a brook-courſe or bottom of a vale, that is croſſed or proceeds up to the canal, and has ditches through which the water can eſcape, without tearing or doing injury to the land adjoining. The moſt frequent *tumbling-bays* or *weirs* to diſcharge water from canals are compoſed of ſtrong walls of brick or maſonry, as *q c*, *Plate* IV, *Canals*, *fig.* 27, whoſe top *q* is coped with hewn and well jointed ſtone, or with a ſtout ſill of oak, the top of the ſame being juſt level with the top-water line *q* D H, or about one foot lower than the top-bank D C I K, A *c* is a paving of large ſtones for the water to fall on, and eſcape at A, and A B *c* are wing-walls at the ends of the weir, to keep up the bank and confine the water. Theſe weirs are generally on the towing-path ſide, on which a low plank bridge, as C *l*, is ſupported over it, called a weir-bridge. When theſe weirs are wanted of conſiderable length, the wall *q c* ought not to be ſtraight but on a circular plan, curving inwards in the middle, by which it will be better able to ſupport the lateral preſſure of the bank behind it; a puddle ditch ſhould be carried up immediately behind the wall, allowing the courſes of puddle to ſet thoroughly, before others are applied, that the great preſſure of the ſemifluid puddle may not overſet or diſturb the wall; and the paving AC ſhould be of large and well jointed ſtones, and if ſet upon a courſe of puddle it would be a further ſecurity againſt their waſhing up, which too often happens. We have ſeldom ſeen any conſiderable weirs or tumbling-bays of the above conſtruction, but where it would have been better to have followed the example of Mr. *James Brindley*, on *Bridgewater*'s canal, and have made a *circular-weir*, or well-fall, on the upper ſide of the canal; we have ſpoken of theſe when treating of the general improvement of a valley, as alſo in the making of reſervoirs, but it may be proper here to refer to a ſection of ſuch a well fall in *fig.* 28, where A′ P′ is ſuppoſed to be the ſection of a vale croſſing the canal C F G I; A M is an arch of brick-work, ſecured on its upper ſide at leaſt, with a covering of puddle, and M N is a well, whoſe ſteining or lining of brick or ſtone is groined into the arch at M, having a well paved floor, three or four feet below M, according to the height N M that the water is to fall, and a coping of hewn ſtone, or a large curb of ſound oak at its top. I O P Q R P′ is intended to repreſent the ſection of a ſide pond or wider place in the canal, from which the water may drop quietly into the well at N from all ſides, and run off at A.

For letting a proper quantity of the ſurplus water of a canal forwards into the ponds below, a ſmall weir is generally conſtructed in the walls at the head of each lock, which lets the water down into the paddle-holes, or crooked arches that convey the water for filling the locks, and hence ſuch are called *paddle-weirs* or lock-weirs. The upper gates or doors of the locks are often boarded no higher than the top-water line, and therefore act as weirs for diſcharging ſurplus water into the lock; and gates of this ſort are called *flood-gates*.

On the *conſtruction of Culverts*, or drains under a canal for conveying away water from the upper to the lower ſide of the canal, it remains for us to ſay, that they ſhould be carefully apportioned in ſize to the ſtream that is to paſs through them in floods, and ſhould be conſtructed of ſound brick or ſtone work, and incloſed, or at leaſt well covered on their upper ſide with puddle. Many engineers have uſed wooden trunks for this purpoſe, but except wood be in great plenty, and of the beſt quality, and good bricks or ſtone very difficult to be procured, it is not adviſable to uſe periſhable materials in ſuch ſituations. If the ground be moory or bad, and a culvert muſt lie pretty near to the bottom of the canal, and have but a ſlight covering, it may be proper, in ſome ſituations, to uſe caſt-iron cylinders flanched together, as was done under or near the *Staffordſhire and Worceſter* canal; and ſuch may be made cheaper and eaſier of carriage, by being in two or three ſegments longitudinally. to be flanched together before they are laid down; and in ſuch ſituations, perhaps leaden rivets might be cheaper and be more durable than wrought iron ones, or nuts and ſcrews. If bricks are to be uſed in culverts, over ſoft and moory ground, or quick-ſands, a cradle compoſed of ribs of wood and boards or rails, ſuch as are uſed for centering, ſhould be prepared, ſuitable to the outer curve of the intended culvert, and ſuch a cradle ſhould be carefully embedded, in the proper place to receive the bricks of the lower ſegments of the culvert: for want of ſuch precaution many a culvert has ſunk partially, perhaps owing to the ſprings excavating the ſand or filth from below, and has been broken, to the great injury of the canal. Culverts are of ſo much importance, that too much care can hardly be taken to make them ſolid and ſecure, and to cover them effectually with puddle: another hint we would here give, reſpecting the choice of places for the culverts; they ſhould never, if poſſible to avoid it, be made exactly in an old brook-courſe, ditch, or ſlough, but in the neareſt ſound ground; and where often they can be got down to the proper depth, without any trouble from water, or at leaſt the ſame can be eaſily pumped out; and the ſtream need not be admitted to the work, until the old brook or ſlough is required to be filled up. In this way it often will happen, that culverts may remain during the winter following their conſtruction, completely excluded from the froſt, and therefore may be done later in the year, by filling in the ſtuff upon them and at their ends, and the mortar be completely ſet before the new channel at the ends for conducting the water through them need to be cut. And we beg to remark, that by an attention to this circumſtance in making new arches under roads, and keeping the bottom of the arch much lower than is generally done, or indeed practicable in the old channel or ſlough, half or two-thirds of the whole expence will generally be ſaved; for a deep and new channel being cut to the new arch; with ſcouring out the brook-courſe for ſome diſtance below, old ford-places, if the deſcent to them be eaſy and convenient, will not require immediately to be filled up or altered; but during any extraordinary flood, the ſame, if compoſed of gravel and hard ſtuff, may act the part of a weir for a ſhort time, in carrying off the water, without injury to the road or material inconvenience to the paſſengers. It will ſometimes happen, that a ſmall ſtream of water is required to paſs under the canal, in places where it is not embanked; in ſuch caſes a crooked or *broken-backed culvert* is to be made, as *m o o n*, *fig.* 29, for paſſing the water from *m* to *n* under the canal C F G I; this will require puddling as before deſcribed, and a ſtrong box full of holes, or grating, ſhould be fixed over each of its ends, as well as pits or holes be made at the upper end, deeper than the mouth of the culvert, to receive and detain the ſand and gravel which the ſtream may bring down in haſty rains, otherwiſe theſe, or the ſtones that miſchievous boys might throw into it, would in time choak it up between *o* and *o*.

The *conſtruction of Tunnels*, or ſubterraneous arches, for drawing off or conveying of water, has been known from the earlieſt periods, as appears by the celebrated works of this kind between lake Copais in Bœotia and the ſea; between the lakes formed by the inundations of the Nile in Egypt and the Mediterranean; as alſo by the courſes of the Roman aqueducts, many of which were tunnelled through hills of great extent. In the mining diſtricts of this country, we have long had levels or audits of conſiderable extent to mines; in the neighbourhood of Matlock in Derbyſhire, the *Helcarr Sough* has been cut through the ſolid rock for nearly four miles in length, for the purpoſe of draining the ſeveral lead mines in the vicinity; *Wirkſworth Moor Sough*, of near three miles long, and *Cromford Sough*, of two miles in length, with many others of leſs note, are alſo to be found at great depths in that neighbourhood. The firſt *tunnel* that we read of, as conſtructed for the purpoſe of navigation, was by M. *Riquet*, near Bezieres on the *Languedoc* canal, in France; and the firſt in this country, was the entrance made by *James Brindley* to the duke of *Bridgewater*'s coal-mines at Worſley near Mancheſter; while the firſt of our tunnels undertaken for the purpoſes of general trade, or as a thoroughfare, was by the ſame engineer at Harecaſtle on the *Trent and Merſey* canal. It is very eſſential to the convenience as well as the beauty of a tunnel, that the arch thereof ſhould be quite ſtraight, and exactly level; conſiderable care will therefore be neceſſary in obtaining an exact ſection, by levelling, of the hill that is to be perforated, when a line in the exact vertical plane of the tunnel is fixed and ſtaked out over the hill; in doing which, it will be right to chooſe the narroweſt place that the hill preſents at the propoſed level, and where alſo the hill riſes rather boldly from ſuch level; otherwiſe an expenſive and troubleſome length of deep-cutting would be neceſſary, or of the tunnel that muſt be dug out from above and then covered up again, before a ſufficient depth of ſtuff over head would be come at, to admit of working under ground; it will alſo be of conſequence, when determining the exact line for a tunnel, to avoid having the deep-cutting and entrances in alluvial or diſturbed and ſlippery ſoils, but, if poſſible, to enter at once upon the ſolid and undiſturbed *ſtrata* of which the hill is compoſed.

It will but very rarely happen, and that only on ſhort tunnels, made for the purpoſe of preſerving the level of a canal, that the workings will not be in ſoil more or leſs full of ſprings of water; therefore one of the firſt operations, after the line and level of a tunnel is finally determined on, is to ſearch by levelling for a place in the neareſt vale or brook that is ſome feet below the propoſed level of the bottom of the tunnel; this muſt be more or leſs, according as the intended tunnel is of greater or leſs length; and from this point a large ditch muſt be opened, with a very ſmall riſe towards the end of the tunnel, as far as is practicable, and then a *heading* or ſough muſt be begun, juſt large enough for men who are uſed to ſuch buſineſs to work in, and to line it ſecurely with bricks as they proceed, but leaving proper openings in the joints for the ſprings to collect freely from all ſides into their heading. Some perſons have ſupported their headings with boards and props of wood, inſtead of arching them; but which practice we cannot recommend: all ſuch works ought to be durably conſtructed, or ſhould any accident or circumſtances, as the want of money, &c. delay the completion of the work for ſome years, all this tedious and expenſive work will perhaps require doing again; it ought alſo to be conſidered, that after ſome years or ages have elapſed, the tunnel may want repairs or alterations, and that the ſame headings may be again opened and uſed, to lay it dry in a ſhort time, if durably conſtructed; which may be of the moſt material conſequence in leſſening the period of interruption to the trade by ſuch repairs or alterations. It will be neceſſary to begin a heading as above-mentioned on each ſide of the hill, and work them up towards each end of the tunnel, along the line of which it is to proceed from each end, riſing gently as it advances towards the middle point, that the water may run freely off; the headings ſhould be a few feet below the bottom of the working, that will be neceſſary for the inverted arch of the tunnel, and a few yards off on the ſide of it; and croſs headings or ſoughs muſt, at ſtated diſtances, be run under the line of the tunnel, into which, openings can afterwards be made to let off the water which collects in each ſeparate working. If the ſoil be rather ſtiff, and the quantity of water in it not very conſiderable, one heading may ſuffice; but where porous ſtuff, with great quantities of water are interſected, it will be neceſſary to branch off an additional heading, to proceed along the other ſide of the line, the more effectually to draw off the water; by which, perhaps, if the headings are done a ſufficient length of time before the tunneling is begun, a quick-ſand, or ſimilar running of the ſtuff, may in ſeveral places be prevented. If in driving the headings, any fiſſures or cavities filled with ſand or looſe matters, are interſected, and are found to bring a conſiderable quantity of water from one ſide of the line, it may be right to drive a croſs heading for ſome diſtance into ſuch porous ſtuff, for intercepting the water before it reaches the intended workings of the tunnel.

The next operation will be to ſet out a line very truly parallel to the line of the intended tunnel, and to mark thereon, at equal diſtances, about 150 yards apart, or oftener if great expedition in completing the tunnel is required, the place of the ſeveral tunnel pits, that are to be ſunk for drawing up the ſtuff excavated from the tunnel, and letting down the centres, bricks, and other things wanted in the work; it will be well to contrive the line of the headings and tunnel-pits, ſo that they may coincide; and in great lengths of heading ſhafts or tunnel-pits may be ſunk at intervals, to give air to the headings, and through which the ſtuff excavated therefrom may more readily be drawn up; and it may be adviſable, in ſome inſtances, to ſet out a line on each ſide of the tunnel, for the tunnel-pits to be ſome on one ſide and ſome on the other of the tunnel, and that both may in places interſect the headings. If bricks or ſtones are not at hand when the tunnel-pits are begun, and wood is plenty, the ſhafts or tunnel-pits may be made ſquare, and have their ſides ſupported by boards and ſtruts of wood; otherwiſe they ſhould be made round, and lined or ſteined like a well as ſoon as they are done; if the ſoil ſhould prove looſe and full of water, it will be neceſſary to ſtein the ſhaft as ſoon as ſuch ſoil is reached, and to work afterwards from underneath the curb, and let the ſteining ſink, as is done in well ſinking. Some tunnel pits have been made over the line of the tunnel, but ſuch do not admit of being ſteined with ſafety, on account of the weight thereof, which would damage the crown of the tunnel, where they were groined into each other; and ſuch of them as are left afterwards for air ſhafts, if the ſoil is wet, will let an unpleaſant dripping of water down upon the goods or paſſengers in paſſing through the tunnel, as we once experienced in paſſing through Braunſton tunnel on the *Grand Junction* canal. A common roll and winch will be ſufficient for drawing up the ſtuff and water, and letting down bricks to ſtein with, unleſs the quantity of water is conſiderable; but it will be proper to erect a horſe gin, or turn beam, ſuch as are uſed at the ſhafts of coal-pits, for the cheaper and more expeditious drawing up the ſtuff and letting down of materials, when the workings have commenced. We have before recommended a line to be ſtaked out exactly parallel to the line of the tunnel for the centres of the ſeveral tunnel-pits, and care ſhould be taken that no gin, or other obſtruction, be erected in this line, ſo that a fine line or ſtring can at any time be ſtretched acroſs the top of any of the tunnel-pits, and be adjuſted without fear of miſtake in the exact range of this line, or parallel to the intended tunnel. When a tunnel-pit is completed and ſteined, and a communication formed with the heading to keep the ſame clear of water; two points muſt be fixed in the ſteining near its bottom, by letting fall or ſuſpending plumb-lines, at the time that there is no wind to diſturb their verticality, and adjuſting another fine line between the two points on the ſteining below, ſo as to be exactly under and parallel to the line above and conſequently ſo to the intended tunnel. The engineer ſhould carefully repeat his levels and transfer the level of the bottom of the intended tunnel, or the ſurface of the water of the canal therein, and mark the ſame carefully in the ſteining of each tunnel-pit: and thus the workmen who are to undertake the work will be furniſhed with the direction, level, and diſtance of the tunnel they are to form under ground.

The work commences, by excavating a paſſage from the tunnel-pit into the line of the intended tunnel, and ſupporting the ſame properly with timber, or walls and an arch, as a paſſage into the work. A piece of the intended tunnel, a yard or more in length, according as the ſoil is found to ſtand, is then excavated, in the proper form, place, and level, aſcertained from time to time by ſtretching a fine line between the marks, on the ſteining before-mentioned, and meaſuring therefrom, and uſing a common plummet level for transferring the level from the level-mark on the ſteining before-mentioned; great numbers of ribs for centerings ſhould be prepared in different ſegments, and in readineſs to put together with nuts and ſcrews, leaving as much room in the middle or centre as can conveniently be done, for the men to work and paſs through after the ſame are put up; the parts of two of theſe ribs are then to be let down the tunnel-pit, and to be put together and fixed up in their proper place and diſtance aſunder in the tunnel; ſhort lengths of boards or laths are to be prepared and fixed on their outſides, as the turning of the arch proceeds; which, as well as every other part of this very difficult work, requires the utmoſt care and experience to make it ſound and ſubſtantial; when this firſt yard or leſs in length of the tunnel is turned and ſecurely keyed up, the ſame is ſecured by ramming in clay, or proper ſtuff, ſo as to fill every cavity above or withoutſide the brick-work. The workmen then begin at each end of the piece that is turned, one party working one way along the line of the tunnel, and another the contrary way, until another yard or other length of the tunnel is excavated, when other ribs are put up and fixed together, boarded, and the brick-work is turned round or behind, the ſame as before; the utmoſt care being taken to joint theſe courſes evenly and ſecurely into the former ones: the vacant ſpace is then rammed up with earth, and a new excavation proceeded with at each end as before. The engineer ought frequently to renew his level-marks from fixed and good bench-marks on the ground, and to examine and adjuſt the ranging line, and alſo himſelf moſt carefully inſpect each working of the tunnel, and examine, by ſtretching a fine line along its centre, and meaſuring and levelling to his ranging line in the tunnel-pit, to ſee that every part of the work is proceeding exactly in the ſame line, and ſo that when in proceſs of time each adjacent working ſhall be joined, and the tunnel be completed, the whole may form one exact and truly ſtraight arch. If the ground proves looſe and bad for ſtanding, it will be proper to continue the work, by different ſets of men, without any intermiſſion; and care ſhould be taken that the work never is left, even for a night, without templets, or ſhort pieces of plank, being put up to cover the roof, that is neceſſarily left open to admit the men's heads and arms, while they are turning and backing up their laſt length of work at the crown; and theſe templets ſhould be ſecurely ſhored up by ſpars or ſtruts, to prevent the earth from ſettling or falling in, which has actually happened in ſome tunnels, owing to the neglect of this ſimple and neceſſary operation, ſo that a conſiderable length of the tunnel required to be dug out from the ſurface of the ground to repair the breach. When the tunnel and ends are completed, ditches are to be dug out, acroſs the headings, near the entrances of the tunnel, and a ſubſtantial puddle-ditch carried up, to effectually dam them up, and force the water that afterwards collects in them to riſe up into the tunnel, through croſs-headings, to be left for that purpoſe.

The tunnel at Bliſworth, on the *Grand Junction* canal being the lateſt that has been completed (Feb. 1805.) we have aſcertained the following particulars relating to it, in order to give ſome idea of the preſent ſtate and expences of tunnel making. The internal width of this tunnel is 16½ feet, the depth below the water-line to the inverted arch 7 feet, and the ſofit or crown of the arch is 11 feet above the ſame line. The ſide-walls are the ſegments of a circle of 20 feet radius, the top arch of one of 8 feet radius. The ſide and top walls are 17 inches, or two bricks thick, and the bottom or inverted arch 13 inches, or 1½ brick thick; every fifth courſe of the top arch, and every eleventh of the ſide walls, is compoſed of two heading bricks, or wedge-like, one inch thick on the inſide and three at the back; alſo, every fifth and eleventh courſe as above (but between the courſes of heading bricks) are compoſed of bricks laid obliquely acroſs the others, the front and back corners being cut off for that purpoſe in the making, for more effectually breaking the joints, of work obliged to be done in ſuch ſhort lengths. The mortar that was uſed, was compoſed of one buſhel of Southam lime (*blue lias*) and three of good ſand. Six inches under the water line, on each ſide of the tunnel, ſlide-rails of fir, 5 inches ſquare, to keep the barges off the walls, are fixed by pieces of oak let into the wall below them; which rails project 9 inches from the wall, and have at every 9 feet, a chock of wood upon the rail, for the bargemen to ſet their pole againſt for ſhoving their barges along. And we were told that this tunnel was contracted for, at 15l. 13s. per yard run; the ſoil principally a hard blue clay, with two or three thin rocks in it. Sufficient headings had been executed ſeveral years before at the company's expence. The ſame contractors were paid 10½d. per cubic yard for excavating the deep cutting at one end of this tunnel, and 11d. per cubic yard for the other. The expence of driving the above headings were, we underſtood, from 36s. to 42s. 6d. per yard run. Nineteen tunnel-pits, ſome of them 60 feet deep, were ſunk for the uſe of the above tunnel, which coſt about 30s. per yard in depth including ſteining. In our inquiries reſpecting Braunſton tunnel, on the ſame canal, we were told, that 320 yards of the ſame was drove in quick-ſands, and that it coſt 4800l. extra on that account. The Foulridge tunnel on the *Leeds and Liverpool* canal, of 1630 yards long, proved to be in ſuch very looſe and bad ground, that the whole of it, but about 700 yards, was obliged to be dug out from above; in ſome parts 30 yards wide at top, and near 20 deep, and immenſe works of timber were neceſſary to ſupport and keep the banks apart, while the tunnel was turned, and the ſoil filled in again. Some part of this work, done about the year 1794, coſt 24l. or more per yard run.

After a good length of the tunnel has been completed and well backed up, and been allowed ſome days or weeks for the earth to have ſettled regularly upon the brick-work, the centering may be removed, by looſening the ſcrews and taking it to pieces, to be again put up and uſed further on in the ſame working. In tunnels upon high levels in porous ſoils, and in others ſometimes near their ends, or in croſſing any dry and porous ſtratum, it may be neceſſary to excavate the bottom a foot or 18 inches deeper than uſual, and to fill the ſame up again with well wrought and ſtiffiſh puddle, and to turn the inverted arch, and as much of the ſides as are below the water-level, upon the ſame, when ſet. Mr. *William Chapman*, page 52 to 54 of his *Obſervations*, &c. before quoted, has given ſeveral directions for ſetting out tunnels, where coal-ſtrata are intended to be interſected and worked thereby, as at Worſley on *Bridgewater*'s, and Harecaſtle on the *Trent and Merſey* canals. It will be a matter of ſome importance, for the engineer to attend to the removing of the top ſoil from a ſufficient ſpace near each tunnel-pit, and to cauſe the ſame to be evenly covered, or the holes therein filled up, with the ſtuff that is drawn up and wheeled away from the tunnel-pits; and as faſt as the different parts of the tunnel are completed, reſerving ſtuff enough to fill up ſuch tunnel-pits as are not to remain for air-ſhafts, to cauſe the top-ſoil to be returned upon ſuch places, to avoid a heavy expence for ſpoil banks, beſides putting the farmers and neighbourhood out of temper by ſeeing the apparent waſte and devaſtation that ſuch works make, when careleſsly or negligently performed. The want of a towing path through a tunnel muſt be very apparent, to all ſuch as have ſeen the tedious and barbarous proceſs in uſe, of a man lying at length upon the gunnel of the barge, and pawing the walls with his feet; in narrow boats this is ſtill more evident, where a plank is obliged to be laid acroſs the barge for the men to lie down upon their backs, in order to be able to reach and paw the walls with their feet! The tunnel near Atcham on the *Shrewſbury* canal, though of 970 yards in length, has a towing-path through it; ſo has one at Newbold on the *Oxford* canal, and many other ſhort ones in different places. In all ſhort tunnels, and even in long ones, if the ground proves, on examination, ſound and good for tunnelling, it certainly would be worth while to give the neceſſary width to the arch, to admit of this eſſential appendage.

Among the moſt conſiderable tunnels that we have, are thoſe at Worſley on *Bridgewater*'s canal, 18 miles in length! Marſden on the *Huddersfield*, 5280 yards; Sapperton on the *Thames and Severn*, 4300 yards; Penſax on the *Leominſter and Kington*, 3850 yards; Laplat on the *Dudley*, 3776 yards; Bliſworth on the *Grand Junction*, 3080 yards; Ripley on the *Cromford*, 3000 yards; Dudley on the *Dudley*, 2926 yards; Harecaſtle on the *Trent and Merſey*, 2888 yards; Norwood on the *Cheſterfield*, 2850 yards; Weſt-Heath on the *Worceſter and Birmingham*, 2700 yards; Morwelham on the *Taviſtock*, 2500 yards; Oxenhall on the *Hereford and Glouceſter*, 2192 yards; Braunſton on the *Grand Junction*, 2045 yards, &c.

The longeſt tunnels that have been propoſed, beſides the above, were one of 5 miles on the once propoſed extenſion of the *Mancheſter Bolton and Bury* to the Calder river; and one of 4¼ miles on the *Portſmouth and Croydon*, through the chalk hills ſouth of the latter place. The towns of Mancheſter, Kidderminſter, and Southampton appear to be tunnelled under by the *Bridgewater's*, *Stafford and Worceſter*, and *Southampton and Saliſbury* canals reſpectively.

The *executing of deep-cuttings* appears to have been long familiar to the Chineſe, ſince we read of ſome of their canals that are in places excavated 80 feet deep! and of others that are cut 20 feet deep for ſeven or eight miles in length! The ſetting out and determining upon the ſlopes of a *deep-cutting* of conſiderable depth and length, are objects deſerving more of the engineer's attention, than has in too many inſtances been beſtowed upon them: the firſt ſtep, after the line and the level of the intended canal are determined upon, ſhould be to examine minutely the ſoil in every part that is to be cut in, and to prove the ſame by the ſinking of ſeveral ſhafts; if any of theſe, towards the centre of the hill, ſhould be found in looſe and porous ſoil full of water, while the ends of the intended cutting may appear to be in ſound ſtuff; it will be worth while, in ſome ſuch caſes, to put down pumps and erect a temporary ſteam engine, to pump up the water during the work, and to drive headings from ſuch pump-ſhaft, on one or both ſides of the intended cutting, and below its bottom, as has been before mentioned, preparatory to driving a tunnel. Should the whole of the cutting appear to be in looſe alluvial ſtuff, full of water, and diſpoſed to ſlip, or a part only of the ground at one end, as happened at the ſouth end of the deep-cutting near Tring, on the *Grand Junction* canal, it certainly will be right to begin ſuch part, by driving a heading up from a proper point below the intended cutting, and to give time for the ſprings to drain off before the cutting is begun, which may afterwards proceed in ſeparate lengths at the ſame time, and with much greater certainty and diſpatch, by the help of croſs headings, to drain off the water, than is practicable without ſuch precaution, unleſs expenſive and very powerful pumps or machines are uſed in the works to clear them of water in different places; while the tendency to ſlip is much increaſed by ſuch ſudden and partial drawing off the water. *Slips* are among the moſt formidable accidents to which canal-works are liable, and can hardly be too much guarded againſt, by giving an extra ſlope to banks in ſuch places, but particularly by driving headings behind ſuch parts, ſome time before the workings are begun, in order that the ſprings may be intercepted, by which the moſt porous and looſe ſtuff like quick-ſands may, in many inſtances, be converted to ſound and good ſtanding ſtuff. After all, where the *ſtrata* alternate very faſt, and have a conſiderable dip, and any ſlippery matter like fullers' earth or potters clay intervene, adjoining to a porous ſoil that can ſupply it with moiſture, it is almoſt impoſſible to avoid ſlips, that will prove moſt diſaſtrous in their conſequences, both in expence and delay of the works; as happened in the Tring deep-cutting above mentioned, on the *Glouceſter and Berkley* canal, and many others which we have heard of.

When the engineer has, by a thorough inveſtigation, as above recommended, aſcertained the nature of his ground, and its tendency to ſlip, he can determine what ſlope the upper banks A B and P K (*Plate* I. *Canals*, *fig.* 6.) ought to have in every part; for theſe ought not to be regulated by the ſlopes C F and I G, againſt which the water is to lie, and the waves of the canal to act, but be as ſteep as the ground or rock will ſtand, in every conſiderable length together; and the degree of the upper ſlopes will be liable to vary accordingly; if theſe are too much ſloped, a waſte of land and of labour in excavating and making ſpoil-banks will be occaſioned, while if they are made too ſteep in ſlippery or looſe wet ground, ſlips may happen that will occaſion ſtill more ſerious expences, and delay alſo. All theſe preliminaries being ſettled, and the width in every part calculated, a number of ſlope-holes muſt be dug at A and P, and a lock-ſpit dug out to join them, by a careful workman, as mentioned before on the marking out of the canal; and the top-ſoil being removed and clamped, from a ſufficient ſpace for ſtowing the ſtuff, the work will then be ready for the contractors to begin digging. This will be our proper place to notice ſeveral machines, and contrivances for aſſiſting the operation of excavating of canals, docks, or other deep-cuttings. The moſt ſimple and uſual method for ſmall depths is by runs of wheeling-planks, ſupported in an oblique direction up the ſide of the bank upon horſing-blocks of different heights, on which the labourers wheel out the ſtuff. In larger works, *turn-beams* or *horſe-gins* are erected on the bank, and a level-ſtage or ſcaffolding is erected over part of the deep-cutting; two ropes wind and unwind contrary ways off the drum or barrel of the gin, and paſs over pulleys fixed over the end of the ſtage; theſe ropes terminate in three ſmaller ones, two of which have at their ends rings, and the other a hook, of iron. When a loaded barrow arrives on the run below the ſtage, a labourer ſtands ready to ſlip one of the rings on to each of the handles of the barrow, and to hook the other end into the fellies of the wheel; when the revolution of the gin draws up the loaded barrow to the ſtage above, which a labourer lands, unhooks the three ropes, and affixes them in like manner to an empty barrow that is to be let down, while a full one is aſcending as before, by the other rope. The loaded barrows are wheeled away upon the ſtage, and run therefrom to any place above that is deſired. At the *London Docks*, we ſaw a very ſimple method uſed; two ſtrong poſts were ſet faſt into the top of the bank of the dock, at 40 or 50 yards from each other; and at about five or ſix feet high on each, a large common pulley or ſhip's block was faſtened, by a ſhort length of rope; through theſe blocks a ſtrong rope was run, whoſe ends terminated in two ſmaller ones, with rings at their ends, as before mentioned: the length of this rope was ſo adapted, that one end reached to the bottom of a very ſteep run or plane of planks that were laid and fixed on the bank, pointing up to the poſt at top; while the other end was nearly at the top of another ſimilar plane at the other poſt. At a proper place between the two pullies, the whipple-tree of a horſe's harneſs was attached or laſhed on to the rope. The operation was conducted, by a man arriving at the bottom of the plane with his loaded barrow, the wheel ſtanding at the foot of the plane, the end of the rope being at the bottom of the plane, and the horſe ſtanding ſtill near the poſt at its top; the labourer then ſlipped the two rings on to the handles of his barrow, and the horſe being ſet in motion towards the other poſt, the barrow was drawn up the plane, and the man alſo with it, who made uſe of his feet, ſuſtaining himſelf from falling backwards by holding faſt by the barrow handles, which he at the ſame time was enabled to guide; when arrived at the top, and entered upon a plane there of leſs inclination, the horſe had arrived almoſt at the other poſt; and while he was ſtopped, and was turned round ready to return again, by the boy who attended him, the labourer ſlipped the rings off his barrow handles, and wheeled the ſame away upon the upper run; another labourer inſtantly ſlipped theſe rings on to the handles of his empty returning barrow, and the return of the horſe let him and his barrow down the plane again, the handles going firſt, and the man holding them as before, but with his back to the barrow; while the other ends of the rope were drawing another labourer and his loaded barrow up the other plane as before. The ſimplicity, diſpatch, and perfect operation of this contrivance, do great credit to its inventor. In very conſiderable works, it will be attended with the greateſt diſpatch, as well as ultimate ſaving of expence, to uſe trams and temporary iron rail-ways; and if the height and quantity of ſtuff to be delivered at any one place be very conſiderable, inclined planes, with ſteam-engines of ſmall dimenſions, (ſuch as are now every day manufactured and improved) ſhould alſo be erected, to draw up the trams, as at the *London Docks* above mentioned. It is evident, that the ſimple and ſtraight courſe for the horſe, attached to the middle of a rope as above, may often be ſubſtituted for the expenſive turn-beams above mentioned, particularly where diſpatch in ſetting the apparatus to work is an object.

Mr. *Ralph Dodd* appears to have contrived a machine to be worked by men, by the means of levers, for excavating canals, which was tried in the year 1794, in the deep cutting at Dawley near Hayes on the *Grand Junction* canal. Mr. *Carne*'s machine for the ſame purpoſe, but worked by a horſe at length, appears to have been uſed in 1794, in the deep-cutting near Coſton Hacket, on the *Worceſter and Birmingham* canal. In the *Monthly Magazine*, vol. ii. p. 594, we have the following account of the operation of *E. Haſkew's* patent excavator: "This machine takes the ſoil from the bottom of the canal, at 40 feet deep, with equal facility as at ſix feet from the ſurface! One of them is at work upon the *Glouceſter and Berkely* canal. By the aſſiſtance of two men only, it removes 1400 loaded barrows from the bottom of the canal, to the diſtance of 40 feet, in 12 hours; and is ſo contrived, as to take up the loaded barrows, leave them at top, bring down the empty ones in regular rotation, and leave them at the bottom. It can be moved along the canal to the diſtance of 26 yards in 10 minutes, by the two men that work it."

In October 1793, Mr. *Joſeph Sparrow* took out a patent for a machine, conſiſting of a box, with its bottom opening on hinges, ſuſpended by a ſort of univerſal gib or crane, the whole moving upon wheels; which he ſtrongly recommends for elevating and diſcharging the ſoil dug out of the canal. See *Repertory*, vol. v. p. 77.

Among the moſt conſiderable deep-cuttings, are thoſe at Aſhton on the *Lancaſter*, Tring on the *Grand Junction*, Coſton Hacket on *Worceſter and Birmingham*, Burbage on the *Kennet and Avon*, Little-borough on the *Rochdale*, Smethwick on the old *Birmingham*, &c.

The *conſtruction of Locks* is ſo important a part of canal-making, and they are ſo very eſſential to the ſyſtem itſelf, that we ſhall give ſome brief particulars of their hiſtory. Mr. *William Chapman*, in his "Obſervations on the various Syſtems of Canal Navigation," has devoted his 7th chapter to an account of the internal navigations of China, compiled from ſir George Staunton's and other authentic accounts. He obſerves, that our pound-locks are unknown in China, (although explained to them by the French miſſionaries in 1685); and it appears from his account, page 76, that their grand or principal canal is, in fact, only a river or ſtream navigation, although greatly diverted by art from its ancient courſe in ſome parts; the current of the water being ſlow, and prevented from running off too rapidly by its deſcent being occaſionally checked by flood-gates, conſiſting of two abutments of ſtone, one projecting from each bank, and leaving a ſpace in the middle juſt wide enough to admit a paſſage for the largeſt veſſels employed upon the canal; and to prevent unneceſſary waſte of water through the flood-gates, the paſſages are occaſionally cloſed by planks let down tranſverſely and ſeparately one above another, their ends reſting in a vertical groove in each abutment; and he obſerves, at page 89, that it was probably between the years of the Chriſtian æra 605 and 618, that theſe were introduced. At page 87, he ſays: "The Chineſe method of overcoming aſcents appears to be long ſubſequent to the attempts of the Egyptians, under the ſucceſſors of Alexander, who, according to Monſ. Huet, biſhop of Avranches, had the art of conſtructing ſluices, or locks of one ſet of gates, ſo as to ſtop the impetuoſity of the current, and be occaſionally opened. Though termed gates, the openings were moſt probably cloſed with beams of timber, let down in grooves; as gates of large width and depth could not be opened without difficulty, even againſt a ſmall difference of level. There are, however, ſuch ſluices with gates upon ſeveral of the running canals on the verge of the *Shannon*. They were erected about the middle of this century, (1750) and are of difficult uſe, becauſe of the force requiſite to open them. Theſe running canals are on the Chineſe principle, and nothing more than new channels for a portion of the river; which, when it is low, are ſtopped as in China, to retain a head of water ſufficient to paſs the boat." And upon, and cauſe the gate to open and ſhut eaſily: the height of the roller above mentioned is made adjuſtable by a ſcrew, ſo that the gate can at all times be kept from dragging on the ſheeting: and inſtead of handles to open ſuch gates, ropes and chains, and capſtans, erected on the banks for the purpoſe, are uſed to open and ſhut them. The upper gates are hung and conſtructed nearly like the lower ones, except that they have no paddle-holes in them, and are uſually boarded no higher than the level of the paddle-weirs behind them, in order to aſſiſt as weirs in carrying off a ſuperfluity of water; but theſe are often attended with bad conſequences, the fall of the water wearing, and in time damaging the breaſt of the lock; and in floods, the ſtream or ſplaſhing of the water may damage goods in, or even endanger the ſinking of, heavy laden boats, in the lock; the ſame may alſo happen with deeply laden boats when the paddles are drawn in aſcending, if the paddle-holes do not enter the chamber of the lock at ſome diſtance below the ſurface of the water, and in a proper direction: on the *Monmouthſhire* canal the paddle-holes are both united, and diſcharge themſelves through the breaſt of the lock into the chamber: a practice that ſeems by no means worthy of imitation. The upper paddles, or thoſe behind the upper gates, are drawn by a rack and pinion, *k*, *fig.* 38, by means of a winch-handle, (which each bargeman and lock-keeper carries with him) in the ſame manner as thoſe in the lower gates, which we have deſcribed above. Guard-rails or curving pieces of timber, *f*, *fig.* 36, ought to be ſtrongly bolted on to piles driven for that purpoſe in the front of the wing-walls juſt above the ſurface of the water, to guide the boats into and out of the locks, without ſtriking the walls; which is far preferable to the huge ſtones let into the wing-walls in ſome places, called bumping ſtones, and calculated rather to break and deſtroy the barges, than protect the walls. It will be neceſſary alſo to provide a ſtrong piece of wood formed to the curve of the breaſt-wall of the lock, *b*, *fig.* 37, before which it ſhould be ſuſpended a few inches above the water when the lock is empty, by means of two or three chains; theſe are called bumping pieces, and are intended to receive the ſtem of the boat, and prevent it ſtriking the wall when the ſame is not ſtrapped or ſtopped in proper time; a practice, however, for which the bye-laws or clauſes in the act ſhould provide adequate fines or puniſhments: and ſtrapping poſts ſhould be ſet firmly into the ground in the proper places for the bargemen to wind their rope, or ſtrap as they call it, and by eaſing it out by degrees, to ſtop the velocity of the boat before it arrives at the gates or breaſt of the lock that it is entering. The gates ſhould alſo be furniſhed with two or three ſtrong upright planks on the lower ſide, *g g*, *fig.* 39, to receive occaſional blows from the noſes or ſtems of the boats, and prevent the planks of the gates being broken or ſtarted thereby. There is room for the ſkill of the engineer to be exerciſed, in forming the lock-ſills and gates to that particular angle which will render them ſtronger for the ſame width and depth of lock, than they would be if they met more acutely, or were ſhorter and met more obtuſely. In very large and wide locks, the gates ſhould not be ſtraight or plane, but a little curving to give them greater ſtrength. On narrow canals, it may not be neceſſary to make double or angle gates, but one gate ſhutting ſquare acroſs the lock may be ſtrong enough to anſwer every purpoſe, and be opened more readily than two gates on the oppoſite banks can be; the upper gates in particular, on account of the comparative ſhallowneſs of the water there, may be ſingle, while the lower gates, if the fall is conſiderable, may be double. In ſetting out canals, where the fall of the ground is very gradual and eaſy, it may be neceſſary to avoid long lengths of deep-cutting below, and of embanking above, or making the line very crooked, to make ſhallow locks, if water is plenty; and under the ſame circumſtances only, will it be allowable to make 10, 12, or more feet locks in particular places, however well the ground may ſuit the ſame; many of theſe double locks were at firſt erected, as on the old *Birmingham* canal, and the *Calder and Hebble* navigation, where about 1783 ſingle locks were obliged to be ſubſtituted, to avoid the waſte of water, before pointed out.

We have not yet noticed an inconvenience and waſte of water, which attend the placing of locks nearer to each other than about 100 yards, or having baſons between them, equal in area to about that length of the canal, as was done at Salter Hebble in 1783 in the alteration above mentioned; without which precaution, a boat in deſcending lets down more water than the pond below will hold, without raiſing its ſurface ſo as to loſe a good deal over the lock-weirs, and ſtill worſe happens in aſcending, for the ſhort pens are ſo much lowered by filling the lock below, that laden boats are unable to proceed for want of water, until a ſupply is let down to waſte, through the upper lock, to help them forwards. As many locks as can conveniently be brought near to each other, on the principles above, and before explained, ſhould be contrived, if it can be done, to be in ſight of each other, and of a length of canal each way; and the lock-keeper's houſe ſhould be ſo placed, that he can when at home at his meals, or otherwiſe, in bad weather, ſee barges approaching the locks, in time to meet them before they enter the locks. Mr. *Fulton* who wrote in 1796 ſays, that the coſt of locks for 25 ton boats, was about 70l. per foot riſe, and for 40 ton boats, about 100l. per foot riſe; this may ſerve to give ſome general idea of the coſt of locks at that time; but we would obſerve, that the decreaſe of the value of money, and the exceptions to all general rules on theſe ſubjects are ſo many, no dependence ought to be placed on ſuch modes of eſtimating. If ſufficient water-way is given in the paddles, and there is aſſiſtance enough to draw both the paddles, and open and ſhut the gates at the ſame inſtants, a boat may paſs each lock of the uſual conſtruction and riſe, in three minutes time, but in general, 5½ minutes will be nearer to the average time loſt at each lock, as obſerved by Mr. *Bevan* on the *Grand Junction* canal. Theorems for the time of filling a lock of given dimenſions, and with given paddles and fall of water, ſhould be found and compared with many experiments on the locks under the care of our reſident engineers. (See *Nicholſon's Journal* 8vo. N° 9, vol. iii. p. 30.) It ſhould be conſidered, that a boat going up lets down or conſumes twice the weight thereof (boat and cargo included) in water, more than in going down through each lock; for the boat on entering the empty lock, expels as much water into the lower reach as its own draft of water, which is made good out of the upper pound when the boat enters the ſame; while a deſcending boat expels its own flotation bulk of water from the full lock into the upper pound, where it is retained on the ſhutting of the upper gates; the mean of a paſſage each way will be a lock-full for each boat, unleſs they go always loaded one way, and empty the other. Mr. *Fulton* ſays, that the conſumption of 25 ton boats through eight feet locks, will in general be about 163 tons of water in aſcending, and 103 tons in deſcending; and Mr. *Chapman* informs us, that boats paſſing and repaſſing a ſummit, laden one way, and returning empty, will require nearly 13 times the weight of their lading of water for their lockage, out of the ſummit pound. Seven hundred tons of lading per day are as much as paſs or repaſs upon any one of our canals, according to Mr. *Fulton.*

We cannot with propriety quit the ſubject of conſtructing locks, without mentioning *coffer-dams*, which are a double range of piles drove very cloſe to each other in a circular form round the mouth of any canal or dock, that is to have a lock built, repaired, or altered, connecting with the ſea, a river, or any exiſting navigation that cannot be emptied of its water; the interval between the piles being filled with earth, the water in the ſpace between the coffer-dam and the intended works is then pumped out for the works to proceed; the many and fatal accidents to which theſe are liable, eſpecially when the works are nearly completed, and the earth is excavating from the bottoms to open the paſſage freely to the lock or works, require all the precautions, ſkill, and attention of the moſt able engineers, eſpecially when the riſe and fall of the tides or waves of the ocean, preſent unequal action on the piles and dam.

The *ſaving of water in the uſe of locks* is a conſideration of ſo much importance in moſt of the inſtances which occur, that it is neceſſary we ſhould mention ſeveral of the expedients which have at different times been propoſed, or practiſed for that purpoſe. Some of the moſt obvious of theſe are, a minute attention to the fitting of the gates and paddles, conſtructing every part of them of the moſt ſeaſoned and durable materials, with the utmoſt precautions againſt partial wear or liability to accidents, by which the gates or paddles would leak and waſte the water; and ſhould ſuch leaks happen, the eſtabliſhment for working the canal ought to be ſuch, as to detect the ſame immediately, and apply the proper repair or amendments without delay. It is of great importance, to adapt the plan or ſurface of the water in the lock, to the ſize of the boat or boats that are to be uſed, leaving as little water uncovered in the chamber of a lock as poſſible, and for this purpoſe, where water is ſcarce, it will be neceſſary to enforce the regulations, that the act ought to contain for the length, width, and form of the boats that are to be uſed; and on canals for large and ſmall boats, to ſee that two or more of the ſmaller boats are ſo contrived as to lie cloſe together in the lock, and occupy the whole ſpace thereof as one of the large boats would do: leſs than this number of ſmall boats muſt not, when water is ſcarce, be allowed to paſs, or without paying ſuch increaſed tonnage or lock dues, as will act like a prohibition.

The *waiting for turns*, particularly by empty or lightly laden boats, ought alſo to be provided for, and it may be neceſſary on ſome occaſions to enforce the ſame; viz. to ſuffer no boat to paſs down, until there is another arrived below, and ready to aſcend as the lock is filled; or any boat to aſcend, till another is ready above to deſcend with the ſame lock-full of water. Where ſmall or ſhort boats are in pretty general uſe upon a canal, as on the *Shrewſbury*, it may be right to adopt the practice which Mr. *Thomas Telford* has deſcribed, who ſays, "the locks are ſo formed as to admit of either one, three, or four boats paſſing at a time, without the loſs of any more water than what is juſt neceſſary to regulate the aſcent or deſcent of the boat or boats that are then in the locks. This is accompliſhed by having gates that are drawn up and let down perpendicularly inſtead of being worked horizontally; and each lock has three gates, one of which divides the body of the lock, ſo as to admit of one, three, or four boats at a time." See *Plymley's* Report before quoted, page 299.

A very ſenſible writer, who has given a full account of the *Grand Junction* canal, in the *Agricultural Magazine* for 1803, vol. viii., under the ſignature of a conſtant reader, ſuggeſts at page 204, the propriety of an additional ſet of narrow locks on each ſide of the ſummit which is in want of water, for the uſe of the narrow boats, to which they ſhould be exactly fitted; as alſo, to avoid the expence of lifting or pumping water, that can be collected in reſervoirs or feeders at ſome diſtance below the ſummit level, by uſing ſhallow locks of only three or four feet riſe each, between the ſummits and the points where ſuch waters can be taken in without lifting. The pumping of water from a lower level to ſupply the waſte of lockage, by means of ſteam engines, has been practiſed with ſucceſs on the old *Birmingham*, the *Barnſley*, and ſeveral other canals; the *Croydon* was to be conſtructed with a dependence on this mode of ſupply, as appears by its act; and on the *Grand Junction*, engines have lately been erected near Tring and near Braunſton, for raiſing water to the ſummit-levels. A very conſiderable power is loſt in the deſcent of the water through the paddle-holes, to fill the lower part of a lock, and again through the gate paddles in emptying the upper part of the lock; we have often thought that it might be practicable to apply this power for returning a certain quantity of water into the upper pound, either by making the deſcending ſtream act on a wheel, or on vanes like thoſe of a ſmoak-jack, or by means of hydroſtatic preſſure, or momentum machines. See *Monthly Magazine*, vol. vi. page 124.

*Side-ponds* are an expedient for retaining part of the water, from the upper part of a lock when it is to be emptied, and to uſe the ſame towards filling the lock again for the next boat: they are ſaid to have been invented by M. *Dubie*, and one with 3 diviſions was tried in a lock of 20 feet fall, on the canal of *Ypres*, near 100 years ago; they are deſcribed by M. *Belidor*. On the 5th July, 1791, Mr. *James Playfair* took out a patent for this mode of ſaving water in uſing locks. See *Repertory*, vol. iii. 303. And in the ſame work, vol. i. p. 377, Mr. *W. Pitt* has deſcribed three ſide-ponds, in form of ſectors of a circle. We read that in April laſt, (1805) an experiment was made on the *Grand Junction* canal, and two of theſe ſide-ponds, with earthen banks like a canal, and each about the ſame ſize as the lock, were tried near Berkhamſtead; into one of them, whoſe bottom coincided with about half the height or altitude of the lock, the upper quarter of the water of the lock, for a deſcending boat, was drawn, and it was there retained by a cloſe ſhuttle; the ſhuttle of the other ſide-pond, whoſe bottom was about level with one-fourth of the height of the lock, was then opened, and about another quarter of the water in the lock flowed into it, and was there retained by the ſhuttle; the remainder being emptied by the gate-ſhuttles into the lower canal; and the boat having paſſed out, and another aſcending one taken its place in the lock, the ſide-pond that had laſt been filled was emptied into the lock, and then that alſo which had been firſt filled; theſe together filled half the lock, before the upper paddles were drawn to fill up the remainder, the ſhuttles of the ſide-ponds being firſt ſhut down; by this means, two boats were paſſed, by letting down only half a lock-full of water into the lower pound; and the lock remained full, ready for another deſcending boat, as before. The time taken up by the above operations was about nine minutes for each boat that paſſed, or 3½ minutes more than if the ſide-ponds had not been uſed. We underſtand that ſide-ponds are becoming common on different canals; their conſtruction offers a very curious exercise for the abilities and ſkill of the engineer, ſo to apportion the number, ſize, and height of the ponds, that, conſidering,

dering the expence of conſtruction, loſs of time in paſſing, and the ſaving of water that is effected, the reſult may be the moſt advantageous.

It appears, that Mr. *Michael Logan* took out a patent in 1804, for raiſing or forcing water into a lock; alſo, that in January 1791, Mr. *Joſeph Brooks* obtained a patent, for a method of drawing up the falſe or moveable bottom of a deep ſide-pond or large well near a lock, and by that means filling the lock with water, until a barge had paſſed up, or another was ready in the lock to deſcend, when the falſe bottom being again let down, the water retreated by the ſame connecting culvert that had brought it into the lock, it was again emptied, and the boat able to proceed on the lower canal, without having waſted or let down any water. See *Repertory*, vol. vii. p. 361.

Mr. *Lawſon Huddleſton* has communicated, through the medium of *Nicholſon's Journal*, 8vo. vol. iv. p. 236, a method of raiſing the water in a lock, from a deep ſide-pond or well as above, by means of a ſolid or heavy plunger that can be let down into the well, by means of machinery that ſuſpends it, when the water is to be raiſed, and drawn up when it is to be allowed to ſink again; the plunger being balanced in all its different degrees of immerſion by a counter weight acting on a ſnail or ſpiral curve.

Mr. *Robert Salmon* has invented a different mode of accompliſhing the ſame thing; his plunger being hollow, and as buoyant as poſſible; and for forcing the ſame down into his ciſtern or ſide-pond, when the lock is to be filled with water, he has contrived a very curious apparatus; it conſiſts of a very heavy carriage on four low wheels, or heavy rollers of metal, connected together by a frame to anſwer the ſame purpoſe. Two frames or planes are prepared, that turn on fixed centres, as a door does on its hinges, but horizontally inſtead of vertically; the other two ends of theſe planes reſt on the two ends of the plunger, by means of uprights therefrom and moveable joints; upon theſe planes the carriage rolls, in ſuch a manner, that when it is drawn forwards, by means of a rope or other machinery, the weight advances upon the plunger, and the planes being at liberty to turn on their joints, it ſinks the plunger by degrees, until at length the four wheels reſt exactly over the joints at the ends of the plunger, exerting the whole weight of the wheels and carriage, to keep it down and elevate the water in the lock; on the carriage being withdrawn, the weight on the plunger leſſens, and it riſes, until at length the four wheels reſt juſt over the hinges or fixed joints, and no part of the weight of the carriage or wheels is then exerted upon, or to counteract the buoyancy of the plunger, and the water retreats from the lock into the ſpace under the plunger. That this carriage, which muſt be extremely heavy for large locks, may not be ſubject to run forwards or backwards on the planes; Mr. *Salmon* has contrived one of them with a peculiar curvature or bend, ſo that the tendency of the carriage is as great to advance as to retreat, in every part; and a conſtant and ſmall weight, hung on the end of a line over a pulley, in the model, will cauſe it to move either way, with a regular and ſteady motion. During the laſt ſeſſion of the *Society of Arts*, in the *Adelphi*, Mr. *Salmon* preſented a model and deſcription of his invention, for which he was honoured with a premium; the model is lodged in the Society's collection, for public inſpection, and a particular deſcription of the ſame is expected to appear in their next, or 23d volume of *Tranſactions*. Mr. *Salmon* has hit upon a method of mechanically conſtructing the *curve* above-mentioned for one of the planes, which is found to approach very nearly to the arc of a circle. A mathematical friend of Mr. *Salmon*, who was ſhewn the model in an early ſtage of his experiments thereon, has propoſed as the 84th queſtion in *Leybourn's Mathematical Repoſitory*, the determination of the nature of the curve in a particular application of Mr. *Salmon*'s principle; we are ſorry, however, to ſee this queſtion ſtill unanſwered by the ingenious correſpondents of that very uſeful and learned work; becauſe this curve promiſes to be applicable on ſeveral occaſions in the conſtruction of hydraulic machines. We have been treating of various contrivances for ſaving water in the uſe of locks of the common conſtruction; and we ſhall now proceed to mention ſeveral ſubſtitutes for locks in overcoming aſcents on a canal or river, but in which the boat continues floating in water; before we proceed to inclined planes, or other ſchemes, in which the boat is to be drawn or ſuſpended out of the water, or the goods to be removed by cranes, &c. to other boats.

*Subſtitutes for locks*, have been called for in ſome ſituations by the actual ſcarcity of water, in others by the previous and neceſſary appropriation of the whole of the ſtreams to mills or the practice of irrigation, and not in a few caſes by the jealouſy and oppoſition of mill, park, and land owners; the intemperate zeal alſo of ſome projectors may have operated, who do not heſitate to prognoſticate the annihilation of lock-canals, by "improved ſcience; in like manner as improvement in machinery renders the old apparatus uſeleſs." See *R. Fulton's Treatiſe*, page 28 and 110, *&c.*: alſo, *W. Chapman's Obſervations thereon*, page 2, &c. Several canals have, like the *Haſlingden*, been reſtricted from erecting locks in particular places, without the mill-owners' conſent; it is therefore no matter of ſurpriſe, that various ſchemes have been propoſed to obviate the neceſſity of common locks. On rivers where the boats are hauled up againſt the ſtream, it is not unuſual to lighten a boat by ſhifting part of its cargo into other boats, called lightening boats, ſo that their diminiſhed draft of water may enable them to be dragged over any particular rapid; and in more extreme caſes, the whole of the lading may be taken out, and be conveyed by land to meet the boat again after it has been dragged empty over the rapid. Rapids may themſelves often be made navigable by jetties, or contraction of the width of the ſtream in ſuch places, and if the fall is rendered very conſiderable thereby, capſtans or machinery may be erected for the hauling up or eaſing down of boats; theſe methods have doubtleſs been in uſe from the earlieſt periods; and we read of great numbers of men in China being employed with ropes to haul boats up their artificial rapids or falls. The methods of uſing ſtop-planks occaſionally to cauſe an artificial flood in Egypt, China, Flanders, and Ireland, as before-mentioned (when ſpeaking of the invention of locks), are alſo very ancient, and ſuch are ſtill in uſe upon ſeveral of our rivers; on the *Ivel* river below Biggleſwade, we think we remember ſeeing upright narrow planks uſed againſt a moveable beam at top of the water, and a fixed ſill at the bottom of the ſame, for penning the water and producing a fluſh or flaſh of water, when the planks are removed and a boat is to paſs. On moſt of our old river navigations there are gates erected to pen the water, and the ſame are drawn up to occaſion a ſudden flaſh while a boat is to paſs. At the entrance of the Worſley mine on the Duke of *Bridgewater*'s canal, we remember a large door that was drawn up for our boat to paſs under it into the tunnel, and then let down to pen the water therein three or four inches higher than it ſtood in the canal. The difficulty of opening large gates, to produce a fluſh of water or to let a boat paſs has been before noticed ; and in the *Memoires de l'Acad. des Sciences* for 1707, we find the deſcription by *M. de la Hire* of gates calculated to obviate this inconvenience in part, by having a large pair of doors in the gates opening the contrary way, or with the ſtream, which on the drawing of a pin can be let to open by the preſſure of the water ; after which the great gates can be opened with eaſe, and when open, the doors can as readily be ſhut again and pinned, owing to their ſtanding in the direction of the ſtream ; and the gates then are ready to be ſhut again as ſoon as the head of water is run off, or the boat has paſſed. It appears, that in extending the navigation of the *Seine* river in France, gates were introduced, which the Duke of *Rouanez* had invented, and which are deſcribed in the *Memoires de l'Acad. des Sciences* for 1669, conſiſting of two upright gates, rather wider than half, and as deep as the channel of the ſtream or river, bent into the arc of a circle of about 48 feet radius; to each of theſe gates ſeveral long beams of wood were fixed, meeting in or near the centre of the circle, of which the gates formed a part ; and here being firmly united, they abutted againſt a ſolid pier of ſtone, or worked on a centre-pin fixed in a ſtrong pile, drove very firmly into the earth by the ſide of the channel, at 48 feet below the place where the gates were intended. A notch was formed in the bank of the channel on each ſide, in form of ſectors of circles, ſufficiently large to contain the two gates and their beams or centering as above. By this conſtruction, the whole of the preſſure of the gates when ſhut and the water penned by them, was brought to act on the two upright pins or centres ; and a very moderate force applied to the head of each gate would draw them apart and into the ſector-like receſſes prepared for them, leaving the channel or courſe of the ſtream perfectly free of any obſtacle, to check either the current or a boat in paſſing through. By a ſmall adjuſtment of the places of the centres, gates of this kind may at all times be made to fit cloſe to each other in the centre of the channel, on its bottom, and alſo to the ſide walls of the channel above them, and yet on being moved a ſmall ſpace from each other they may clear thoſe walls and be free to move into the receſs, in the bottom of which there may be ſmall rollers to carry the gates with leſs friction, or rollers under the gates may be uſed for the ſame purpoſe. See *Jacob Leupold's Theatrum Machinarum*, folio, publiſhed in 1726 at Leipſig.

Dr. *James Anderſon*, of Edinburgh, has contrived, and publiſhed in 1794, in his *General View of the Agriculture, &c. of the County of Aberdeen*, a method of elevating or depreſſing ſmall boats, floating in a coffer or large tight open caſe full of water, that can at will be made to coincide and connect at one of its ends with either the upper or lower canal ; into or from which the boats may paſs without the loſs of more water than is neceſſary to fill the narrow ſpace between a draw-gate at the end of each canal and at the ends of the coffer, when the ſame is preſſed and retained cloſe to the end of the canal, and a ſmall additional quantity to reſtore the equilibrium and give motion to the coffers, of which there are two exactly of ſimilar dimenſions ſuſpended and connected together by ſtrong chains. *Mr. Chapman's* conciſe deſcription of this invention is ſo much to our purpoſe, that we beg to uſe his words, who ſays, "the doctor there obſerves, that, for all the purpoſes of commerce, no more width of boat is requiſite than four feet, or more than two or three feet depth ; and that the length might be indefinite, ſo as not to be inconvenient for aſcending and deſcending between any two levels of canal, which he propoſes to be done in the following manner, viz. that the lower level be run up to nearly under the end of the upper, and terminate by an upright end and two ſide walls of maſonry, to the full height of the fall, with a pier in the middle dividing the paſſage between the two ſide walls into two openings of rather greater width than the boat ; the two ends of this pier are to be elevated ſo as to ſuſtain the axis of a wheel, of a diameter equal to the width of the pier, and half of each opening. A chain paſſing over the wheel ſuſpends from each end a rectangular caſe, ſo hung, that when one ſhall be at the bottom ready for a boat to float into, the other ſhall be at the top, and cloſe preſſed to the wall or frame at the end of the canal, ſo as to prevent the eſcape of water ; then, by opening a ſtop-gate at the end of either canal, and another at the correſponding end of the caſe, it is obvious that the boat may float in or out. The lower boat and caſe (or caſe with water only) are then in a kind of lock juſt containing the caſe, and of ſufficient depth to permit it to deſcend to the level of the lower canal. From this lock there is a conduit to keep the water down below the canal bottom. Theſe are the outlines of the invention, which, where the connection between the two levels is a precipice, or ſo ſteep as to require only a ſhort tunnel to the well or pit, up or down which the boats are to move, may, on receiving ſuch improvements as it is capable of, be eaſily carried into effect for ſmall boats, for which the author alone propoſes it. It is obvious that under other circumſtances, as to ſituation, the expences of high embankments above, of deep ſinking below, and of bringing up the conduit to lay dry the lower locks, muſt more than counterbalance any advantage than can be derived from it." Where the fall is conſiderable, the doctor has propoſed a balance chain, of the ſame weight per foot as the ſuſpending one, to be hung from each coffer or caſe. See *Repertory*, vol. ii. p. 21.

On the 24th December, 1798, Mr. *James Fuſſell* took out a patent, (ſee *Repertory*, vol. xi. p. 7.) for a method differing in principle from that of *Dr. Anderſon* above deſcribed, only in having an axle and *two* wheels thereon, at a diſtance from each other on the middle pier, and under his coffers or receptacles, ſimilar axles with a pair of wheels, and inſtead of his coffers or receptacles being ſuſpended from the two ends of a chain paſſing *over* the wheel, as in *Dr. Anderſon's* method, *Mr. Fuſſell's* two chains are fixed to the tops of the ſide walls, paſſing *under* the wheels of his receptacles, and over the wheels and axle on the middle pier. He alſo deſcribes rollers or guides by the ſides of his lock-pits to ſteady the receptacles, and a toothed wheel on the middle ſhaft or axle connected with a fly or brake wheel to regulate the motion of the chains and receptacles ; he alſo propoſes the gates or hatches at the end of his receptacles, to be balanced by counterweights, and to draw down into a cavity prepared for the purpoſe, when a boat is to be paſſed in or out, inſtead of drawing up. And if the fall be very conſiderable, he ſuggeſts the propriety of a ſhort tunnel or arch to conduct the lower canal into the lock-pit, inſtead of an open notch or perpendicular-walled cut in the hill for the lower canal. It appears that this balance-lock of *Mr. Fuſſell's* was put in practice, or at leaſt tried, on the *Dorſet and Somerſet* canal, near Froome, on the 6th of September, and 13th of October 1800, on a 21 feet fall, and with boats of ten tons burthen ; delays in completing the above canal, and forming a communication, prevented this lock from being made uſe of for a long time afterwards ; but we believe that the note of a late writer on the above experiments, ſtating that a ſubſcription was ſet on foot in 1802, to raiſe money to make a lock in this very place, originated entirely in miſtake.

On the 18th of March, 1794, Meſſrs. *Rowland* and *Pick-*

the axis or barrel for the rope, to give motion to the ropes and cradles with their contents, when a ſufficient quantity of water had been let into the upper cheſt by a valve and pipe contrived for the purpoſe, or out of either of the cheſts by means of a ſtring attached to their valves, till an equilibrium of the two cheſts, cradles, and boats upon them were obtained. By this apparatus it was propoſed, that in general one boat ſhould be aſcending upon one of the planes while another deſcended on the other; but the caiſſons were large enough to admit of ſufficient water from the upper or lower level being taken into one of the cheſts, to balance a loaded boat on the other. The capſtan worked by men was propoſed to be uſed, for dragging boats out of the upper canal over the upper plane and platform on to the cradle in order to deſcend. Walking-wheels, to be worked by men, were alſo propoſed inſtead of water-wheels, where the water was very ſcarce in the upper canal. The canals abovementioned were never carried into execution, although an act of parliament were obtained for the former, nor have we heard of any of Mr. *Leach*'s planes being brought into actual uſe.

Mr. *William Reynolds*, of Ketley, in Shropſhire, was the firſt who contrived and executed an inclined plane (which was completed in 1788) for the paſſage of boats and their cargoes, which was found fully to anſwer, and continued in practical uſe. Mr. *Thomas Telford* has thus deſcribed the ſame, in *Plymley*'s Agricultural Report of Shropſhire, p. 291. Mr. Reynolds "having occaſion to improve the mode of conveying iron-ſtone and coals from the neighbourhood of the Oaken-gates to the iron-works at Ketley, theſe materials lying generally at the diſtance of about a mile and a half from the iron-works, and at 73 feet above their level, he made a navigable canal," called the *Ketley* canal, "and inſtead of deſcending in the uſual way, by lock, continued to bring the canal forward to an abrupt part of the bank, the ſkirts of which terminated on a level with the iron-works. At the top of this bank he built a ſmall lock, and from the bottom of the lock, and down the face of the bank, he conſtructed an *inclined plane*, with a double iron rail-way. He then erected an upright frame of timber, in which, acroſs the lock, was fixed a large wooden barrel; round this barrel a rope was paſſed, and was fixed to a moveable frame; this laſt frame was formed of a ſize ſufficient to receive a canal boat;" theſe boats were 20 feet in length, 6 feet 4 inches wide, 3 feet 10 inches deep, and each carrying 8 tons; "and the bottom upon which the boat reſted was preſerved in nearly an horizontal poſition, by having two large wheels before and two ſmall ones behind, varying as much in the diameters as the inclined plane varied from an horizontal plane. This frame was placed in the lock, the loaded boat was alſo brought from the upper canal into the lock, the lock-gates were ſhut, and on the water being drawn from the lock into a ſide-pond, the boat ſettled upon the horizontal wooden frame, and as the bottom of the lock was formed with nearly the ſame declivity as the inclined plane, upon the lower gates being opened, the frame with the boat paſſed down the iron rail-way on the inclined plane into the lower canal, which had been formed on a level with the Ketley iron-works, being a fall of 73 feet. Very little water was required to perform this operation, becauſe the lock was formed of no greater depth than the upper canal, except the addition of ſuch a declivity as was ſufficient for the loaded boat to move out of the lock; and in dry ſeaſons, by the aſſiſtance of a ſmall ſteam engine, the whole of the water drawn off from the lock was returned into the upper canal, by means of a ſhort pump. A double rail-way having been laid upon the inclined plane, the loaded boat in paſſing down brought up another boat, containing a load nearly equal to one-third part of that which paſſed down. The velocities of the boats were regulated by a brake acting upon a large wheel, placed upon the axis, on which the ropes connected with the carriage were coiled." It appears that this plane has an inclination of about 22°, except near the extremities, where it diminiſhes to about $11\frac{1}{2}$°; and that about 400 tons of coals uſually deſcend thereon daily. In 1789 a copper medal, or halfpenny, having a repreſentation of this plane on one ſide, and of the caſt-iron bridge at Coalbrook-dale on the other, was ſtruck, and iſſued by the Coalbrook-dale company. Since the practicability of inclined planes has been eſtabliſhed, by the ſucceſs of the Ketley plane, but few acts have been paſſed for new canals, without a clauſe authorizing the company to erect inclined planes, inſtead of locks, if they ſhould be found moſt adviſable. Before proceeding to mention the inclined planes of different conſtructions, which have been ſince made or propoſed, we ſhall notice the under-ground plane at Walkden Moor, which was completed in October 1797, upon *Bridgewater*'s canal, it being ſo ſimilar to the Ketley plane above deſcribed.

The *Duke of Bridgewater*, in the year 1800, cauſed an account to be preſented to the Society of Arts, in the Adelphi, London, of the inclined plane which he had erected and brought into uſe, under the direction of his agent, Mr. *Benjamin Sothern*, between two different levels of his tunnels or ſubterraneous canals from Worſley near Mancheſter; for which the Society voted his grace their gold medal, and publiſhed plans and ſections, and an account thereof, in their 18th volume of *Tranſactions;* to which we refer, only mentioning, that this plane, which is $35\frac{1}{2}$ yards high, and 151 yards long, through an inclining tunnel hewn in the ſolid rock, at near 60 yards below the ſurface of the ground, differs from the Ketley plane, in having, upon about 57 yards of the lower end of the plane, a ſingle rail-way only, to or from which the two rail-ways above join by eaſy curves, to proceed up to the locks by one rail-way, or down by the other. A winch and pinion are provided, to be occaſionally worked by two men, into cogs in the large brake wheel, for ſetting the boats in motion. Rollers are placed between the iron rails, for the ſlack part of the great ropes to run upon, and for further preventing the wear of theſe ropes, they are lapped round with a ſmall cord. About 12 tons of coals are let down in each boat, and a boat and cradle on which it runs, weigh about 9 tons more. About 16 minutes is conſumed in paſſing a pair of boats: the boat-cradles are 30 feet long and $7\frac{1}{3}$ feet wide, moving on 4 iron rollers. A ſmall bell gives notice from the bottom to the top of the plane, when the boats are placed on the cradles, and the machine ready to work. The water of the locks is let down by a paddle, through a perpendicular ſhaft, to the middle canal, and acts as a water-bellows to force freſh air down into the extenſive tunnels and works that are on the lower level. The upper gates of the locks turn in hollow grooves like a common lock, but the lower gates draw up in grooves, by means of windlaſſes, to let the boats paſs out or in when the water is let off.

Mr. *William Reynolds* has the honour of introducing another ſort of inclined planes, on the *Shropſhire* canal, where there are three planes in uſe of 120, 126, and 207 feet riſes! The act for this canal paſſed in 1788, and it was completed, under the direction of Mr. *Henry Williams*, as reſident engineer, and opened in 1792. Theſe planes are upon the ſame conſtruction as thoſe at Ketley, except that there are no locks at the top of the deſcending planes, but the ſame are continued above the ſurface of the water in the upper canal, and terminate in a croſs beam, from which another plane and rail-way deſcend into the upper canal: this is for avoiding the waſte of water which locks at the top of the planes occaſion. A ſmall ſteam engine is uſed for working the axis of the rope barrel, at ſome diſtance from which, on the upper ſide, there is a large pulley or wheel, fixed at a proper height, for the great rope to paſs over, to draw the boats up or let them down the long deſcending plane; another ſmaller axis and rope barrel are provided, which can, like the larger one, be caſt in or out of the engine-geer at pleaſure; this laſt is uſed for hauling the boats up the ſhort aſcending plane, from the upper canal. The engine can alſo be uſed to draw empty boats occaſionally up the long plane, in caſe ſuch want to paſs, when there are no loaded ones ready to deſcend, and draw them up, as we have before deſcribed. The wheels or rollers under the cradles appear on theſe planes to be equal in diameter, and not of different ſizes, ſo as to bring the two ends of the boat to a level, as on the *Ketley;* they do not, therefore, appear applicable to very ſteep planes or to long boats. On the windmill plane, which is 600 yards in length, and 126 feet riſe, ſix boats have been paſſed down, and ſix taken up within the hour, the ſteam-engine and three men only being employed: the boats here are of the ſame length and breadth as on the *Ketley*, but ſhallower, ſo as to carry but five tons; and ſuch boats are ſaid to be paſſed down theſe planes for three-pence each, and the empty boat taken up gratis. At Wombridge on the *Shrewſbury* canal, Mr. *Thomas Telford* has ſince erected a plane, 223 yards in length, and 75 feet riſe, exactly on the ſame conſtruction as the above, of which an account, with plans and ſections, may be ſeen in *Plymley*'s Report, p. 294.

On the 18th of June, 1793, Mr. *Joſhua Green* took out a patent for the uſe of double inclined planes and rail-ways, on which cradles for the boats are to be uſed, conſiſting of a frame of wood, and the bottom corded by ſtrong ropes acroſs each other like the common bedſteads, that the boat may not be ſtrained; in order to introduce wheels of four feet diameter for the cradle to move upon, a ſtrong frame is to ſurround the cradle, and be firmly bolted to it, but leaving an interval ſufficient for the four or more wheels to move between it and the cradle, by which the axles can be fixed to the wheels, and work in gudgeons at each end, with leſs friction than common wheels or rollers. To his brake-wheel handſpokes are adapted, for men to aſſiſt in ſetting the machine in motion, inſtead of a winch as before deſcribed on *Bridgewater*'s; the ropes are to be capable of adjuſting to the proper length as they ſtretch or contract, by a ſcrew or otherwiſe. A third inclined plane is directed to be made, for the purpoſe of carrying a counter weight or veſſel, whoſe rope is to paſs over another axis with a brake and handſpoke wheel, for hauling the cradles and boats out of the upper level to the ridge or croſs beam, or to eaſe them down into the ſame. He recommends ſpare veſſels laden with water to be in readineſs to paſs up or down the oppoſite plane, as a counterpoiſe to any ſingle loaded boat that may arrive at the plane. Alſo that ſingle planes, and with leſs inclination, may in ſome inſtances be adopted. See *Repertory*, vol. v. p. 11.

*Earl Stanhope*, in the year 1793, in recommending the *Bude and Hatherleigh* canal, propoſed, between the different ponds or water-levels of the intended canal, to have iron rail-roads of gradual and eaſy aſcent, on which boats of two tons were to be uſed, ſuſpended between a pair of wheels of about 6 feet diameter, and to be drawn up or let down the ſame by a horſe, in order to be launched in the upper or lower water-level or canal.

On the 8th of May, 1794, Mr. *Robert Fulton* obtained a patent for the uſe of a double inclined plane, whereon cradles having ciſterns or caiſſons under them, no ways different from Mr. *Leach*'s above deſcribed, except that the boats were in ſome caſes to be taken on to the cradles *ſide-ways* inſtead of length-ways; this was propoſed to be accompliſhed by ſhort inclined planes, on which the boats, upon wheeled carriages, were to be dragged out of the upper and lower canals by means of ropes working on the axles of water-wheels; a brake is to be uſed for regulating the motion of the boats and ciſterns, when brought nearly to an equilibrium by the valves; brace-blocks, or pulleys, to be uſed for ſhortening or lengthening the large ropes when neceſſary. See *Repertory*, vol. vii. p. 222.

Mr. *William Chapman*, at page 85, of his Obſervations, which were written principally in anſwer to Mr. *Fulton*'s treatiſe, ſuggeſts this *ſide-way* motion of boats on inclined planes, as before-mentioned, not knowing, as we apprehend, of Mr. *Fulton*'s patent above-mentioned, becauſe it was not publiſhed till 1797; and it is indeed ſingular, that Mr. *F.* ſhould, in 1795, have written 144 quarto pages on the ſubject of canals, and not once have given a hint of his having taken out a patent in the year before for ſome of the principles therein explained, and ſo highly recommended; nor does his long letter in the *Star* Newſpaper of the 30th of July 1795, announcing this work being in the printer's hands, make the leaſt reference to his patent. The Board of Agriculture muſt, we are confident, have been equally in the dark, in March 1796, or they would not have given Mr. *R.* the opportunity of puffing into notice, a ſubject wherein he was a patentee through their means. We beg here to remark, that our duty, in treating this part of our ſubject, ſeems to require the mention of all the inventions and methods which have come to our knowledge; and though we ſhould have more pleaſure in making known the inventions of thoſe who lay the ſame at once open to the community, yet, as all of theſe will be ſo in a few years, we have not thought it right to exclude or be leſs particular in the mention of, inventions or contrivances ſo circumſtanced: but to give the dates of ſuch patents wherever we could, that their termination (at the end of 14 years) may be known.

Mr. *Robert Fulton*, in his 4to. work, entitled a "Treatiſe on the improvement of Canal Navigation," publiſhed in London in 1796, with many plates, has propoſed the uſe of narrow canals and inclined planes, on which ſmall and ſhallow rectangular boats are to be uſed, having low *wheels*, or rather trucks fixed underneath their bottoms; he propoſes to have on his double inclined planes, an endleſs chain paſſing up the track of one plane and down the other, round or over wheels that are of the proper ſize and fixed in proper places and directions at top and bottom of the planes to ſuit the ſwag or curvature of the leading chain; theſe are made to revolve at pleaſure, with power ſufficient to drag a loaded boat up one of the planes, (by means of a ſhort double chain belonging to the boat which is to be hooked into, and will at the proper time diſcharge itſelf from the leading chain), by means of toothed geer attached to the upper wheel, on which there are ſtubs to prevent the chain from ſlipping; which connect with a water-tub deſcending in a perpendicular ſhaft, diſcharging itſelf at bottom by means of a valve, and returning again to the top, when caſt out of geer, by means of its counter weight, balance-chains, and fly, ready to be again charged with water from the upper canal. The motion of the whole is regulated by a pair of fanners or an expanding fly; a ſmaller axle and cog-wheel are provided, working into the tub-ſhaft geer, when neceſſary to draw the boats up a ſhort plane that deſcends into the upper canal, on to a bridge or curving top which unites the two planes, a ſtop being provided to retain the boat in its proper poſition, while this laſt chain is diſcharged, and the boat-chains are hooked into the leading chains as before mentioned. When a deſcending boat happens ready to draw another up, or a ſingle one requires to be let down, the tub-geer is to be caſt off after the boat has been dragged on to the bridge thereby, and the fanners are to be truſted to for eaſing it down. Mr. *Chapman*, who reviews this ſyſtem, juſtly objects to the ſmallneſs of the boat-wheels, and recommends that larger ones ſhould be uſed in a water-tight caſe or groove in the floor of the boat. Owing to the endleſs chain, Mr. *Fulton* ſays, that during part of the deſcent of a boat, the power thereby acquired may draw another boat out of the upper canal on to the bridge; and a boat may in ſome caſes be kept ready in that ſituation to begin the work; or, he propoſes a common windlaſs tooth and pinion to be uſed for that purpoſe. For protecting delicate goods in his boats, he propoſes a frame above the boat for ſupporting the leading chains; and for transferring light timber that is too long for his boats, he propoſes rafts to be made with a carriage under them, having wheels like thoſe of his boats, by which theſe rafts are to be conveyed on the inclined planes. A totally deſcending trade will not require the tub-ſhaft, tub or its geer; and the ſame may be added without interrupting the trade, when at any future time it ſhall become an alternate one.

Mr. *Fulton* next deſcribes (page 71.) his ſingle inclined plane for great heights; here, his wheel-boats are to aſcend and deſcend on the ſame rail-way on his plane; the leading chain winds round a barrel or drum, that can, by means of geer that caſts in and out, be moved with two different powers and velocities, by a water-tub working another barrel at the head of an upright ſhaft as before deſcribed; or the tub-ſhaft geer can be entirely caſt off, for the tub to aſcend, or for a boat to deſcend on the long plane, regulated by a brake or fanner as before mentioned. Mr. *Fulton* propoſes his leading-chain, wheel or barrel, to be ſo placed over the bridge between the upper and lower planes, and with a roll or ſmall drum below it, that the leading chain hooked to one end of the boat may drag it out of the upper canal on to the bridge, and lower it down from thence without unhooking, and the ſame in aſcending. Mr. *Fulton* (at page 76.) propoſes for ſmaller riſes, inſtead of a tub-ſhaft, tub or its geer, to erect an overſhot water-wheel, to be ſupplied from the upper level, with proper geer, and a drum for one end of a chain to wind round, the other, after paſſing over two pulleys at the head of a plane, (one pulley would anſwer better, by placing the water-wheel or its drum oblique to ſuit the ſame) to be hooked to the ſtern of the laſt of three or more boats that are to aſcend, each of the boats before it being in like manner hooked by their own chains to the leading chain, according to the weight of the boats, and the power of the water-wheel; when water is let on to the wheel, theſe are to be dragged up, and diſcharge themſelves one by one, and ſlide down into the upper canal; boats are to be dragged up, ſingle or more than one, out of the upper canal on to the bridge, and when they begin to preponderate towards the deſcending plane, the water is to be ſtopped from the wheel, which is to be allowed to turn backwards, and act as a fly or regulator to the velocity of the boats in their deſcent. The water-wheel will not often admit of being ſupplied from the lower level, as Mr. *Fulton* has ſuggeſted, on account of the great expence or the impracticability of a drain or ſough to diſcharge its water; the ſame difficulties, as Mr. *Chapman* has obſerved, attend ſeveral of the tub-ſhafts which Mr. *Fulton* has propoſed, for the perpendicular lift of boats from one level of a canal to another, of which we ſhall treat hereafter. At page 37, and fig. D, in his 5th plate, Mr. *Fulton* has recommended his wheel-boats, to be uſed, on a ſingle aſcending plane to a coal-pit mouth, to be drawn up the ſame by a chain winding on a drum, worked by the mine-engine, and lowered down the ſame by means of a brake attached to the drum.

On the 2d of Auguſt 1796, Mr. *John Luke* took out a patent for an inclined plane, on which boats in a cradle are to be drawn up, by the deſcent of a water-tun on another plane, aſſiſted by a water-wheel in certain parts of its motion, or in ſcarcity of water, by a hand winch. See *Monthly Magazine*, vol. ii. page 652.

Mr. *William Chapman* recommends an improved kind of inclined plane in his *Obſervations*, &c. of which he has given an account at page 96., "by making the deſcending and aſcending way continuous, like Mr. *Fulton*'s; and having a lock at the head of the deſcending way, long enough to contain a ſeparate carriage for three or four boats (or ſo many as form what has been called a conjoined boat). Theſe boats, on deſcending, would draw another gang light, or half loaded upwards, over the top of the ridge, no lock being requiſite on that ſide. The chief objections to this, lie in the vaſt weight of a gang of boats, which, in a ſteep angle of deſcent, would require a very heavy rope, and in the difficulty of returning the carriages to their proper place. The latter may be got over by keeping the two ways at a little diſtance, and joining them above and below by a ſemicircular rail-way for the carriages; coupled to each other (in ſuch a way as to ſuit the different boats that are to reſt upon them, and yet admit of the neceſſary extenſion, when the boat came over the concave part of the inclined plane, which may be affected by a worm ſpring) to run along under water, after they have parted with their veſſels. Both in this and the method laſt deſcribed, the water contained in the lock may be drawn off into a reſervoir, at the head of the inclined plane; in this reſervoir, or a pond communicating with it, may be fixed a broad underſhot water-wheel between the two rail-ways, to retard the motion of the deſcending boats and throw back the water. This wheel may run in a cloſe caſe, and be divided round its periphery by different ſhroud boards, forming ſo many wheels that one or more portions of its width may be employed at the ſame time in throwing up water according to the neceſſity of the caſe, to be determined by the velocity of the deſcending boats, which by means of a centrifugal regulator" (the flying-balls or governor uſed in Bolton's engines, windmills, and other machines,) "will open one or more of the penſtocks to let water below the wheel, or ſhut them all as occaſion may require. The reſervoir under the wheel ſhould of courſe never be exhauſted, but when drawn down to a certain extent ſhould by a floating weight or any other method let in water from the head canal. Theſe means will anſwer for a deſcending trade, and if the aſcending trade be more that the other can draw up and water be deficient, recourſe may be had to a ſteam-engine."

We have thought, that a different kind of lock at the top of an inclined plane might be uſed with advantage, compoſed of a rectangular box, water-tight, except one end, which ſhould be open, and having wheels under it of different heights, ſo as to ſupport it upon the plane in an horizontal poſition, its ſize being juſt ſufficient for a boat to float into it. The end of the upper canal ſhould terminate in a ſingle lock-gate, the outſide border or edges of which ſhould be leathered, or covered with liſt; ſo that when the carriage or cradle above deſcribed is drawn up to the top of the plane, its open end ſhould fix itſelf againſt the lock-gate opening, in a water-tight manner, by means of wedges or ſcrews prepared for the purpoſe of confining it; a ſmall ſhuttle in the lock-gate might then be opened to admit water to fill the cradle, making it act as the chamber of a lock; the lock-gate being opened, a boat might enter the cradle, from which it would expel great part of the water into the upper canal again, if the boat and cradle were nicely adapted to each other; the lock-gate and ſhuttle ſhould be again ſhut, when the water might be drawn off into a ciſtern, (to be returned if neceſſary by a water-wheel or any of the methods before mentioned), the cradle be unfaſtened from the lock, and be let down the plane by any of the regulators before propoſed. For paſſing the boat out of this cradle at the bottom of the plane, the back or other end of the cradle might open, or, perhaps a better method would be to continue the plane deep enough into the lower canal, that the cradle, which ſhould in this caſe be heavy enough to ſink in water, might deſcend low enough for the boat to float out or in, over its end; ſide rails ſhould, in this caſe, ſtand up from the cradle, to ſhew its place when under water, and for guiding and fixing the boat over it, with liberty to ſink into the cradle, as it is drawn up the plane to the ſurface of the water.

Mr. *Chapman* informs us (page 7.), that for avoiding the friction of the gudgeons of rollers, when charged with the weight of a loaded boat on an inclined plane, *Earl Stanhope* has propoſed, that rollers between the boat's bottom and a ſmooth plane ſhould be uſed, moving or rolling with the boat, for half the boat's length; the rollers then to return to their places by means of weights acting over pulleys, and connected by a chain to the ends of each roller. Mr. *Fulton*, he ſays, propoſes to uſe moving rollers, attached to, or going under and through the cradle that contains the boat, the gudgeons at the ends of the ſeveral rollers being paſſed through the links of an endleſs chain or collar, by which the rollers are returned in a cavity under the boat, that is reſting in the cradle; this endleſs chain of moveable rollers for leſſening of friction, appears to be claimed as part of *A. G. Eckardt*'s patent of the 31ſt of January, 1795, for various machinery: ſee *Repertory*, vol. ii. p. 365.

The principles of ſetting out canals, where inclined planes are to be uſed, are ſimilar to thoſe we have explained, in recommending ſeveral locks to be brought together to form a ſet of ſuch, or a conſiderable fall in one place; it will, however, be neceſſary, in determining the place for an inclined plane, to chooſe ground which ſlopes as regularly as poſſible between the intended upper and lower levels; if any part of the ground for the intended plane is ſpringy and diſpoſed to ſlip, the ſprings muſt be cut off by effectual and durable under-drains. It will be better ſo to contrive the plane, if practicable, that little, if any, filling up of hollows ſhall be neceſſary in forming the plane, to avoid new made ground, which on a conſiderable declivity would perhaps ſlip, after heavy rains had ſaturated it with water; the foundations for the ſtones or bearers muſt alſo be carried through ſuch new made ground, and into the firm-ſtuff. The ſtuff which is removed in forming an inclined plane, ſhould be carefully levelled, or diſpoſed of in holes, ſo as not to form ſpoil-banks, and be covered with the top ſoil previouſly taken from thoſe places. In caſe a perpendicular ſhaft and ſough thereto is wanted at the head of the plane, the knowledge of the *ſtrata*, or matter which compoſe the hill, may be of conſiderable importance, in determining the beſt place for the mouth of the ſough; which may not always be the neareſt point at the proper level, to the intended ſhaft, if the *ſtrata* or meaſures of the hill are various and dip conſiderably. The plane being formed of a ſufficient width on the ground, a ſtrong framing of timber braced acroſs may be uſed, if good and durable hewn ſtone is not in plenty, fixed firmly down to a ſufficient number of piles drove into the ground, the interſtices between the framing being filled with good rubble ſtone, or gravel rammed very tight down. On theſe frames two or four ſils or rails of ſound oak, according as the plane is to be ſingle or double, ſhould be laid parallel and at the proper diſtances from each other, and firmly bolted down; and on theſe the ſlips or ribs of iron are to be evenly and ſmoothly fixed, for the wheels of the boat, or boat-cradle to run upon, and upon which they are to be confined from getting off ſideways, by a rib ſtanding up for that purpoſe, either upon the wheels or on the rails. If good ſtone is in plenty, it will be proper to cover the whole of the plane with aſhler or well jointed ſtones, taking care that the courſes acroſs the plane at proper intervals are formed of large ſtones let ſome diſtance into and firmly bedded in the ground; and to theſe the caſt-iron rails (that are uſed on good and durable planes) may be faſtened by pins caſt into a hole with lead. Or, if wooden rails are to be uſed inſtead of caſt-iron ones, ſtrong ſleepers of wood ſhould be worked into the paving of the plane at proper intervals, on which to bolt and faſten down the rails. Care ſhould be taken, in all works of this kind, where large or hewn ſtones are uſed, to let no part of the mortices or holes which are cut in ſuch ſtones remain open or unfilled with lead or cement, to prevent the rain filling them with water, which would in winter time expand with the froſt, and in moſt inſtances ſplit the ſtone. It is unneceſſary for us to point out to experienced engineers, the great care and precaution which ought to be uſed in works of this nature, to make every thing ſubſtantial and more than ſufficient to ſuſtain the weight or ſtrain to which it will be ſubjected, and which ought in moſt caſes, particularly the moving parts, to be previouſly calculated, and before the apparatus is put together for actual uſe, every rope, chain, framing, wheel, &c. &c. ſhould be ſubjected to a greater ſtrain than can occur in practice, to avoid the unpleaſant, and perhaps fatal accidents, which might otherwiſe happen, by which a prejudice might at the onſet be excited againſt the ſcheme, ſo powerful as to cauſe it to be laid aſide without proper trial. It would much exceed our limits to enter fully into this ſubject, we ſhall therefore proceed to thoſe other contrivances for overcoming aſcent on canals, where boats have been lifted out of the water, or propoſed ſo to be, by a perpendicular aſcent; after which, there will ſtill remain to deſcribe thoſe methods which require the ſhifting of the cargoes of boats into other boats, or to rail-way waggons, &c.; firſt mentioning that on the *Shrewſbury* canal, an inclined plane is uſed for paſſing the boats over part of the aſcent, while locks are uſed for the other parts; and Mr. *William Chapman*, at pages 54 and 99 of his *Obſervations*, &c. recommends whenever coals in large quantities, lime, lime-ſtone, or other minerals, are to be conveyed along canals, or are brought in by branch canals on a ſmall ſcale, there being a ſcarcity of water which reſervoirs cannot remedy, where it can be done in ſetting out the canal, in addition to the locks, to overlap the levels in a ſteep place, and communicate them by an inclined plane for boats (or a double rail-way for tram-waggons) leaving the lock communication to anſwer all the general purpoſes of commerce. The ſame author obſerves, that the porterage of articles from one level to another, and carriage of the boat itſelf is ſtill practiſed in various parts of North America, as the falls of the Mohawk, from the Mohawk to Wood Creek, at the falls of Orandaga, &c.; alſo at ſeveral places called Tarbets, in the Highlands of Scotland, as in Cantyre, Loch Lomond, Arrachar and Long, Jura, &c. Among the principal inclined planes for boats, are thoſe of Hay, Windmill-hill, and Wrockardine-wood on the *Shropſhire* canal, Walkden Moor on *Bridgewaters'*, Ketley on the *Ketley*, Wormbridge on the *Shrewſbury*, &c.

On the 8th of May, 1794, Mr. *Robert Fulton* took out a patent, as before-mentioned, in which he deſcribes (ſee *Repertory*, vol. vii. p. 227.) either a rectangular upright notch in the ſteep face of a hill, to the top and bottom of which the two levels of a canal are brought, or a large perpendicular ſhaft and tunnel at the bottom for the lower canal, through which notch or ſhaft boats are to be drawn up or let down, in a pair of water-tight cradles, ſuſpended at the two ends of ſtrong ropes of chains, that are to paſs over pulleys fixed above the top of the ſhaft, and connecting with a brake-lever or wheel, to regulate the deſcent of a boat in one cradle, and aſcent of another in the other, after they have been brought to an equilibrium by the letting out or in of water by proper valves. The boats are to be drawn into and out of the cradles, by ſhort inclined planes, in the upper and lower canal, on which the boats on wheeled carriages are to be drawn by ropes winding on the axis of water-wheels, to be turned by water let out of the upper canal thereon; brace-blocks are to be uſed for adjuſting the length of the great rope, and capſtans may be uſed inſtead of water-wheels, for paſſing the boats on and off the cradles. Mr. *Fulton,* in plates 11 and 12 of his "Treatiſe on Canal Navigation," and his deſcriptions thereof (pages 97 and 100) has more fully deſcribed this method; and propoſes for a deſcending trade, that the full boats ſhould draw up the empty ones, and inſtead of inclined planes for getting the boats on to the cradles, a cage of iron ſhould be uſed, into which the boats on the lower canal can be floated; and for diſcharging them into the upper canal, he propoſes two lock-carriages, or large water-tight boxes, open at one end, moving on iron rail-ways, and which can be advanced by racks and pinions over the ſhafts, while the boat is ſuſpended high enough to clear its bottom; the open end of this lock-carriage is made to fit, and be retained againſt the frame of a lock-gate at the end of the upper canal, (as in Dr. *Anderſon's* and *Fuſſell's* methods, and the water-tight cradle which we have lately mentioned), when the water being admitted by a valve, to float the boat in the lock-carriage, to the level of the upper canal, the lock or draw-gate thereof is to be opened, and the boat floated out of the cage to proceed on the upper canal; to the pulleys or drum-wheel over which the chains act, a fly or fanners is propoſed to be connected to regulate the motion; as alſo an axis with cranks to work pumps, by which the water that is drawn off again from the lock-carriage into a ſide reſervoir may be pumped up again into the upper canal, that no water may be loſt. For an alternate trade, to which it may be at firſt adapted, or the neceſſary parts applied afterwards, an additional ſhaft muſt be ſunk, in which a water-tub is to be ſuſpended, inſtead of another cage and boat, as a preponderating weight; this is to be filled out of the water reſerved in a ciſtern that is drawn out of the ſliding lock-carriage.

Mr. *Robert Fulton* (ſee his "Obſervations," p. 94. and plates 9 and 10.), particularly deſcribes a ſpecies of Cranes, by which boats are intended to be drawn up, in an iron cage, through an upright notch or ſhaft, and by the motion of the jibs, are to be moved over the upper canal and lowered down to float thereon, or the reverſe in deſcending; for this purpoſe a perpendicular notch or ſhaft for the boats, and another for a water-tub, as a counter-acting and motive force, is to be provided; a reſervoir is to be formed by the ſide of, and about 8 feet from the bottom of the tub-ſhaft, into which the water diſcharged from the tub, when at top, can be conveyed by a proper valve and ſpout; proviſion is to be made, by valves and ſpouts, for filling the tub from the upper or lower level of the canal, as occaſion may require; and a valve is to be provided, opening by a pin in its bottom, for diſcharging the water when it reſts on the bottom of the tub-ſhaft; over the tub-ſhaft a drum is to be fixed, for the tub-chains and crane-chains to wind round, and to this drum a fly or fanner is to connect by toothed wheels and axles, to regulate the velocity of the motion. The crane-chains are to be double, and proceed to two ſeparate jibs fixed on centres, at proper diſtances from each other, having the ends of their jibs connected by a coupling-rod of the ſame length, by which they will always move parallel, and ſuit the diſtance of the hooks on the top of the iron boat-cage. For raiſing a boat out of the upper canal, the ſame being floated on to the cage ſuſpended from the cranes or jibs, and the water-tub (to which balance-chains are to be adapted) being near the bottom, water is to be drawn, by a valve and ſpout, out of the reſervoir into the tub, till it preponderates and draws the cage and boat out of the upper pound; the jib is then to be moved over the boat-ſhaft, and the water emptied from the tub by ſuffering it to deſcend a little farther and ſtrike the bottom, when the boat will be lowered eaſily, by means of the fly, to the lower canal, where it can be floated out of the cage; and the reverſe on aſcending. If water is very ſcarce in the upper canal, and a ſough or tunnel can readily be driven, for emptying the tub-ſhaft, the ſame may be made deep enough to draw water from the lower inſtead of the upper canal, for the preponderating power. We have not heard that any of theſe perpendicular lifts for boats have been executed, we ſhall therefore proceed to the other kinds of cranes and perpendicular lifts for the cargoes of boats.

Mr. *Bridge*, of Tewkſbury, about the year 1759, contrived, for the navigation on *Stroudwater* river, a kind of cranes, with double jibs, that could be either uſed ſingly or together, and act as a balance to each other; theſe were erected on a ſtrong walled bank, that ſeparated the upper and lower levels of the river at the ſeveral mills. The boats to be uſed on each different level, or mill-ſtream and dam, were all of one ſize, and made exactly to ſuit and contain a certain number of ſtrong wooden boxes, without any loſt ſpace. The goods or lading of the boats were placed in theſe boxes, and when they arrived at the firſt crane, one end of the chain thereof was hooked to a box, while the other was hooked to a ſimilar box of goods in the other level, and by a peculiar ſtructure of the crane, worked by two men at windlaſſes, both boxes were drawn up and ſuſpended, ſomewhat higher than the bank of the upper canal, when the jibs were turned half round, and the boxes of goods were lowered down and replaced each other in the boats; the ſame operation was repeated with each of the remaining boxes, when each boat was ready to proceed with its new lading upon its own level to the next cranes. It can hardly be neceſſary to add, that the expence and delay of this method cauſed it to be ſoon laid aſide.

Mr. *Edmund Leach*, in his treatiſe before quoted, propoſes boats to be unladen and laden with boxes of goods as above, but to work the cranes by water-wheels, or by wheels for men to walk in.

The *duke of Bridgewater*'s tunnel from his canal into the coal-works at Worſley, after it had proceeded for a great way ſtraight into the hill, came at a great depth to be under a ſmall brook or conſtant ſtream of water, by the ſide of which a large water-ſhaft was ſunk, and a drum and large brake-wheel erected over it, of ſufficient ſize that a man who ſtands before the lever thereof has his two hands at liberty to pull the lines which connect with the valves, and give ſignals to thoſe below, while by lunging, or ſtepping forwards, with his breaſt againſt the lever, he can in an inſtant ſtop the machinery in any part of its motion, or regulate the ſame at pleaſure. There are two water tubs, which are very large and have a valve and pin to empty themſelves quickly when they arrive at the bottom; they are ſuſpended by large ropes or cables from the drum, while other large ropes deſcend therefrom through another, or coal ſhaft, by the ſide of the middle or principal tunnel, into and over the navigable tunnel, which there is at, we believe, 60 yards lower level. On this loweſt canal boats are uſed, ſimilar in their dimenſions to thoſe above, and containing boxes, which being filled with coals at the ſeveral terminations of this canal, in the ſeams of coals; the boats are puſhed along by means of rings that are fixed all along the roof of the tunnel, at the proper height for a man, who walks on the top of the coals, to lay hold of, and ſhove the boat along by. The boat being arrived under the coal-ſhaft, and one of the water-tubs being at the top of its ſhaft, the coal-rope anſwering thereto is hooked on to the box of coals, and the deſcent of the water-tub, immediately on the ringing of a bell, draws up the ſame to the level of the principal canal, where being drawn aſide over an empty boat, it is lowered into the ſame by a ſlight reverſion of the motion of the machine; when the interval of emptying the tub at the bottom by its valve, gives time for hooking another box to the other rope which is at the bottom, when the other water tub is filled, and the machine ſuffered to move, by the man who leans againſt the brake. This very complete and economic machine was contrived and erected by Mr. *James Brindley*, and it is ſo conſtructed, that when coals are not drawing, the alternate deſcent of the water-tubs work ſome very large pumps, which are ſufficient to lift all the mine-water of the lower level into the middle canal and keep the lower canal always at the proper height for navigation.

The ſame tunnel of *Bridgewater*'s canal being continued a great way further into Worſley hill, till under Walkden moor, another ſubterraneous canal or tunnel there begins, at 35½ yards higher level, this laſt being near 60 yards from the ſurface; from the ſurface two ſhafts were ſunk, one terminating in and over the upper tunnel or canal, and the other in and over the middle or principal canal; there is another canal ſtill lower, which we have been laſt ſpeaking of, after paſſing cloſe by the canal above: between theſe ſhafts a large drum was erected on the ſurface, with a brake wheel and a pair of ſtrong ropes. Two boats being arrived at the ſhafts on the upper canal, one of them loaded with boxes of lime-ſtone, that was wanted at the ſurface, and another with boxes of coals intended to be transferred into an empty boat in the middle canal; the ends of the two ropes were faſtened to a box of coals and a box of lime-ſtone, when the ſuperior ſize and weight of the coal-boxes drew the lime-ſtone to the ſurface, to be there landed and depoſited, at the ſame time that the box of coals was depoſited in the lower boat, ready to proceed on the canal to Mancheſter or other places. This method was in 1797 ſuperſeded by an inclined-plane for letting down the boats laden with coals, from the higher to the middle level, and returning the empty boats and boxes, as we have before-mentioned. At Brierly-hill, near Coalbrook-dale, the extremity of a branch of the *Shropſhire* canal, great quantities of coal and iron in crates made of iron were let down one of two ſhafts, which connected, with the termination of the canal above and the ends of a rail-way in a tunnel below, from which lime-ſtone in ſimilar crates was drawn up the other ſhaft to be placed in the boat; a large barrel and brake-wheel were fixed between the tops of the ſhafts, and cranes with jibs, by which the crates could be raiſed and moved from the boat over the ſhaft, or the reverſe; theſe ſhafts, which were 120 feet deep, were not found to anſwer, in point of expence, ſo well as inclined planes, and Mr. *Telford* informs us (*Plymley's Report*, p. 296 and 307.) that inclined planes have been ſubſtituted, on which crates of coal, or iron pigs, or goods, deſcend and draw up other crates containing lime-ſtone, for the uſe of the iron-works above, by means of ropes, a drum, and brake-wheel, with a much leſs portion of manual labour, and more expedition, than was done by the ſhafts above-mentioned. Near Lilleſhall lime-works, on *Donnington Wood* canal, ſimilar ſhafts were once uſed, but are now ſuperſeded by an inclined plane. At Coombe-hay, on the *Somerſetſhire Coal* canal, after the trial of Mr. *Weldon's* diving caiſſon, inclined planes for deſcending boxes of coals were erected, and uſed for ſome years; but the delay and expence were found ſo great, that the company effected the purchaſe of ſome mills, and under a new act of parliament, erected 22 locks in place of theſe inclined planes. Having finiſhed with the different kinds of inclined planes, and other ways of procuring the aſcent of boats or their cargoes, we proceed to thoſe which are uſed for overcoming the principal or ſudden aſcents on rail-ways or tram-roads; whereon waggons or trams are uſed for the conveyance of goods, the ſame being drawn on the level parts or eaſy aſcents or deſcents by a horſe, as we ſhall deſcribe ſhortly.

Mr. *John Buddle*, in the *General Magazine* for 1764, page 285, has given a view and deſcription of the coal-waggon which had been then long in uſe on the wooden rail-ways in the neighbourhood of Newcaſtle upon Tyne. This waggon moved on four wheels of caſt-iron, or of wood with iron rims, having an edge ſtanding up on the rim of each wheel, in order to guide and keep them upon the wooden rails. The waggon is in ſhape of an inverted priſmoid, having a door or falſe bottom hung with hinges and faſtened by a haſp, that can be let go to let out the coals when the waggon has arrived on the ſtaith, and over the ſpout which is to convey the coals into the ſhips or keels, or into a heap below as a ſtore; obliquely over one of the hind wheels a ſtrong crooked lever of wood is fixed and ſuſpended, by a ſtrap when not in action; this lever, called a convoy, is intended to act as a brake, by being let down upon the wheel when the waggon is deſcending down an inclined-plane, or ſteep part of the rail-way called a run; and on theſe occaſions the horſe is unharneſſed from the front of the waggon and tied behind, and the waggon-man mounts aſtride on the hinder end of the convoy, the fore-end being confined cloſely in a ſtaple in the ſide of a waggon; and, by means of a reſt that there is for his feet at the tail of the waggon, he applies juſt ſo much of his weight upon the convoy as will either ſtop the waggon or give it the proper velocity in every part of its deſcent down the hill or run: ſee the *Agricultural Magazine*, vol. iii. p. 241. In the year 1783, we remember ſeeing an inclined plane or waggon-way as above deſcribed, on which the coal waggons deſcended down the hill from Wibſey-ſlack to the town of Bradford, which is on a branch of the *Leeds and Liverpool* canal, their velocity being regulated by convoys as above. But ſome waggons which we have ſeen, had the convoy fixed to a moveable joint at the front of the waggon, and had a large block of wood thereon, which, when the convoy was let down, wedged in between the fore and hind wheels, and acted moſt ſecurely as a brake for ſtopping or regulating the velocity of deſcent. The empty waggons were drawn up the hill again to the coal-pits by a horſe.

An *inclined plane for waggons*, was erected ſome years ago by Mr. *Barnes*, a coal viewer at Bywell, near the *Tyne* river, of which a deſcription is given in the *Agricultural Magazine*, vol. iii. p. 367, as follows: "It is a very ingenious, yet ſimple combination of machinery, for the purpoſe of regulating the conveyance of waggons laden with coals down an inclined plane, and for bringing the empty ones back again, by the ſame power that reſiſted its impetus in the deſcent. The length of the rail-way in which the waggons

gons run is about 864 yards, which diſtance it deſcends in two minutes and an half, and re-aſcends in the ſame ſpace of time; ſo that the loaded waggon can be let down with eaſe and ſafety, the coal diſcharged and the empty waggon returned to the pit within the compaſs of ſeven minutes. The impelling and reſiſting power of motion are derived from a plummet of 16½ cwt., which the waggon in deſcending and aſcending alternately raiſes and lowers to the depth of 144 yards. The rope, by which the waggon is impelled and accelerated, winds round the axis of a large wheel in a nich or groove in the middle, which gives the rope only ſpace to coil round upon itſelf, and thereby guards againſt all poſſibility of entanglement. Near to the axis of the large coiling-wheel, there is an oblique indention (a range of teeth or cogs) of caſt-iron, which correſponds with and works into a ſimilar conformation on the rim of a ſmaller wheel; round which the plummet-rope is coiled or warped, and it is in conſequence thereof moved round, only once in ſix rotations of the ſuſpending and retracting wheel, which is the ſame proportion that the elevation of the plummet weight bears to the deſcent of the waggon; to preſerve the rope from injury by dragging on the ground, rollers with iron pivots and braſs ſockets for it to run upon, are elevated in the middle of the rail-way, but ſufficiently low to prove no obſtruction to the waggons which paſs over them." On ſhorter inclined planes than the above, horſe-gins are ſometimes uſed, for drawing loaded waggons up, and at the ſame time letting empty waggons down the planes.

The *conſtructing of Rail-ways*, or, as they are often called, tram, dram, or waggon-roads, require the application of principles ſo exactly ſimilar, and they are ſo intimately blended with our ſeveral navigable canal and river eſtabliſhments, that we have before mentioned our idea of the impropriety and difficulty of ſeparating them by deferring the account thereof to a future place in our work: the ſubject of inclined planes, of which we have laſt been treating, has required the mention of ſo much relating to *rail-ways*, that we beg to proceed with and finiſh that part of our ſubject, before we reſume the ſubject of bridges, towing-paths, fences, drains, boats, moving boats, &c. which yet remain to be mentioned. From the firſt opening of the coal-mines on the banks of the *Tyne* river above Newcaſtle, until about the year 1680, it appears, that the coals were conveyed in carts and wains, from the mouths of the ſeveral pits, to the keels or veſſels, that conveyed them to the ſides of the ſhips lying below the bridge. As this kind of fuel came to be ſubſtituted for wood in London and other cities, and towns on the ſouth and eaſtern parts of the iſland, the conſumption of Newcaſtle coals became ſo conſiderable, that we are told, that ſeveral coal-mines, as the Kinton, Benwell, Jeſmond, &c. gave employment to 400 or 500 carts or other carriages each, for conveying the produce of thoſe pits to the water-ſide: the difficulty and expence of maintaining ſo many horſes, and coſt of repairing roads for ſuch conſiderable traffic, occaſioned the introduction, about the period above mentioned, of waggon-roads or wooden rail-ways, on which waggons of a large ſize, with wheels of a particular form to ſuit the rails, were uſed, and which one horſe could draw, owing to the regular and eaſy deſcent with which the rails were laid. It was not until the year 1738 that this important improvement was introduced at the White-haven collieries on the weſtern coaſt, and it is truly ſurpriſing to obſerve how ſlow the introduction of them was in other parts.

Way-leaves or ſlips of ground were ſet out and hired on leaſes, or purchaſed by the different coal-owners of the ſeveral proprietors of lands, lying between their pits and the river, and this, not by the neareſt route, but in ſuch a direction as gave the moſt eaſy and regular deſcent. The inequalities of this ſlip of ground were levelled as a road, hollows were filled up, and ſudden hills lowered, when ſleepers or large logs of wood were laid acroſs the ſame, their tops being all of a regular height; upon theſe, two rails, generally of beech wood, were laid parallel to each other, their ends abutting cloſe to each other, and were firmly pegged down to the ſleepers. The tops of the rails were planed ſmooth and round; the wheels of the waggons were low and of caſt iron, or of ſolid wood with iron rims, which were not flat on the edge, but hollow to receive and move on the wooden rails; the inſide edge of each wheel projecting near two inches, in order to confine the wheels effectually to the rails, and prevent the waggon from being drawn off the road. From all conſiderable works, there was a main way made for the paſſage of loaded coal-waggons as above; and another, or bye-way by its ſide, for the return of the empty waggons. When coal-mines had been worked into deeper ground, and pits or ſhafts were opened below Tyne-bridge, the rail-ways therefrom were conducted to the top of a ſtage or wooden building called a ſtaith, on the wharf or key where the ſhips lay; and the coal-waggons, a deſcription of which we have already given, were either emptied at once through the ſpouts into the hold of the ſhip, or depoſited in the warehouſe below in ſtore for future ſhips. One indifferent horſe could in general draw three tons of coals from the pits to the river ſide upon theſe wooden rail-ways; which mode of conveyance became further improved by the introduction of plates of wrought iron nailed on to the rails for the waggon-wheels to run upon. Attempts were made in different parts, to introduce caſt-iron inſtead of wooden rails; but owing to the brittleneſs of the material, and the great weight of the waggons in uſe, they did not in general ſucceed.

About the year 1768, Mr. *Richard Lovell Edgeworth* contrived a remedy for the principal objection to caſt iron rail-roads, in making uſe of two or three ſmaller waggons linked together, inſtead of one large one; a model of three of theſe he preſented to the *Society of Arts* in the Adelphi, London, and was honoured by the premium of their gold medal. In the year 1788, the ſame gentleman, on ſome temporary wooden rail-ways for manuring of land, made ſeveral experiments, in the preſence of different Mechanics, on the application of friction-rollers for diminiſhing the friction of waggon axles. The rail-ways hitherto conſtructed were private property, or for the accommodation of particular mines or works, and it was not, we believe, until about the year 1794, that Mr. *Samuel Homfray*, and others, obtained an act of parliament for conſtructing an iron dram-road, tram-road, or rail-way, between *Cardiff* and *Merthyr Tidvill* in South Wales, that ſhould be free for any perſons to uſe, with drams or trams of the ſpecified conſtruction, on paying certain tonnage or rates per mile to the proprietors. Soon after the year 1797, iron rail-ways began to be conſtructed as branches to the canals of Shropſhire; and, in other parts of England, Mr. *Benjamin Outram*, an engineer, began to conſtruct the ſame upon improved principles, of which Dr. *Anderſon* has given an account in his *Recreations*, vol. iv. pages 199 and 473.

On the 25th of June 1799, the houſe of commons made a ſtanding order for extending to all bills for making any ways or roads, commonly called rail-ways, or dram-roads, all the orders (of May 7, 1794) relating to the introduction of canal bills. One principal difficulty, the proviſion of water, does not here occur, unleſs for docks or baſons, which are not unfrequently neceſſary, at the termination of a rail-way, at a river, or exiſting canal; and, as the owners of ſtreams of water are not under dread of loſing the ſame by the paſſage of a rail-way near them, and the ſame is applicable ſo much more eaſily to the uſes of the owners and occupiers, than a canal is, leſs difficulties will attend the obtaining of general powers for making ſide or collateral branches, at any future period; and of connecting the ſame with different rivers, canals, or rail-ways, making the parties a compenſation in tolls or otherwiſe, if ſuch connection ſhall appear to draw off or leſſen the trade upon any part of their line of communication, as often happens; and ſuch ought always to be carefully inveſtigated, and liberally eſtimated by the engineer, and the company be adviſed to act accordingly.

In ſurveying a line of country for a *rail-way*, principles ſomewhat different from thoſe which apply to a canal, are to be kept in view; in the latter caſe, exact or dead levels are traced out, and the caſe of towing or dragging boats thereon is nearly the ſame in going one way as in returning the other, whether laden or not, for the aſcent or deſcent of the locks or planes are there overcome by a different power than that applied to towing upon the levels; in a rail-way the caſe is different, the horſe which in going one way draws a very heavy load down a ſlight deſcent, has to return again with the empty waggons, or a lighter laden, up the ſame aſcent. It will therefore be neceſſary, as a preliminary ſtep to ſetting out a rail-way, to calculate as accurately as poſſible the quantity of lading which will at the firſt or any future period be to paſs each way upon the line, or on any particular parts of it, becauſe on this will depend, in a great meaſure, the ſlope that it ought to have, and conſequently the ground which the rail-way line ought to occupy. If it ſhould appear, on an accurate calculation, that the ſame weight of lading may be expected to paſs one way as the other, or that the ſame will preponderate at ſome periods one way, and at others the other way, the rail-way muſt in this caſe be ſet out in levels or very nearly ſo, and the unavoidable aſcents and deſcents muſt be made by inclined planes, as before mentioned; on which either a greater number of horſes muſt be ſtationed to draw waggons up, and in letting down, their wheels muſt ſome of them be ſlippered; or loaded deſcending waggons muſt draw up the others; the deſcent of a weight or tub full of water in a ſhaft muſt draw up a waggon, or more than one; or, a ſteam-engine, horſe-gin, or walking-wheel, muſt be uſed as a moving power, with fly or brake regulators of the motion, as we have before mentioned. If the trade will always preponderate one way, as it generally will in the deſcent from mines to navigations, and the ground will admit of the ſame, the regular inclination of the rail-way ought to be ſuch, that a horſe can draw the uſual lading down with the ſame eaſe as it can return with the waggons when emptied, or with a partial lading, in caſe of there being a ſmall aſcending trade. If the ſlope of the ground ſhall be found greater than to ſuit the above calculation, the rail-way ought to be ſet out for as great lengths together as is practicable, with the proper ſlope, and then to ſet out an inclined plane, as before mentioned. It ought to be well conſidered, where a rail-way or a branch from the ſame appears likely to have a deſcending trade at preſent, whether, at a future period, by extending the ſame forwards to any town or manufactory, or by other change of circumſtances, the aſcending trade is likely to be materially increaſed, in proportion to the deſcending; becauſe in ſuch caſe, the line would require to be altered in its ſlope, and moved to a new place, or it muſt continue to be worked to a conſiderable diſadvantage by the horſes having to travel down the line unemployed, to fetch up a portion of the loaded waggons. It will readily be perceived, that the adoption of *the beſt line*, of which the circumſtances of the trade and nature of the ground is ſuſceptible, is a taſk requiring a degree of ſkill and patient reſearch, not at all inferior to any thing required in the ſetting out of a canal, and it can hardly be neceſſary to point out the neceſſity of employing the moſt competent engineer, and allowing him proper time and aſſiſtance, in order to get the moſt eligible line marked out. A rough ſection of the different routes which appear eligible for a rail-way made by levelling with a ſpirit level, will be very uſeful in the firſt inſtance; from which, and a view of the ground, the engineer will be able to determine nearly the place and extent of the inclined planes, or ſteeper parts of the rail-way which will be neceſſary; theſe laſt being always made as ſhort as the nature of the ground and circumſtances will admit. Theſe being ſettled, the line of the intended rail-way muſt be traced on the ground, beginning at the higheſt point, and ſtretching a chain on the ground, one end being held at the point of departure, the other muſt be turned round upon the face of the deſcent, until a point marked by this end is found, which is one link (or ſomething more or leſs, according as the ſlope is to be) lower than the upper end; the chain being now moved forwards, till the hinder end reſts on the point laſt determined, the other end is to be moved, accompanied by the levelling target, until a new point is found, one link lower than the laſt, and ſo on; by which, a line having the regular deſcent of one link in a chain, will be traced out on the ground, until the place of an intended inclined plane is reached. The ſtakes which are put in to mark the place of each ſucceſſive ſtake will, as in the caſe formerly mentioned, of ſetting out a level for a canal, be found very crooked in many places; and it will be neceſſary for the engineer to ſtake out a new line, after a moſt careful view and conſideration of the ground, as the approximate line for the centre of the rail-way; which muſt be without any ſudden bends, that would occaſion friction of the wheels againſt the ſides or ribs of the rails. Single rail-ways will generally require about four yards wide, and double ones about ſix yards wide (excluſive of the neceſſary ſpace for drains and fences), and this width will require to be levelled like a road or plane: it will therefore be proper ſo to ſet out the line, that the quantity of ſtuff which is to be lowered in one place ſhall always, with the leaſt diſtance of throwing or barrowing, make up other places which are too low. Where ſudden valleys are to be croſſed, it will be neceſſary to conduct the line, ſo as to cut into the hill at each ſide of it, to find the ſtuff as readily as poſſible for forming the embankment: it will alſo be neceſſary to ſearch carefully for gravel or ſtones fit for making the road between and under the rails; and if ſuch can be got in the line, it may be a conſiderable ſaving of labour and of damage to the land, as well as a ſource of future advantage to the concern, to cut pretty deeply into ſuch materials, as we have before ſuggeſted and explained on the ſetting out of a canal; which the reader, who wiſhes to underſtand this ſubject, would do well to conſult. A line of ſtakes, exactly at a chain (100 links) apart, ſhould be put into the line laſt ſtaked out, and drove ſucceſſively into the ground, beginning with the higheſt, ſo that the head of each may be very exactly one link (that being the fall we have aſſumed) below the level of the laſt; of courſe theſe will either ſtand above the ground, or be drove in the bottom of a hole, according as the ground wants raiſing or ſinking, and will enable the engineer, on a review of the line, to judge more correctly, or to calculate where neceſſary, whether the line is ſet out in the right place to be formed at the leaſt expence of labour, and with the leaſt damage to the land; and when this is found to be the caſe, the neceſſary width of land can be determined on, and the ſame ſurveyed and deſcribed by the ſurveyor, for the purpoſes of depoſiting the neceſſary plans with the clerk of the peace and with parliament. The different regular ſlopes or parts of the rail-way being determined in this manner, the ſteeper ſlopes or planes that may be neceſſary to join them, muſt next be ſet out and determined, by taking the whole fall or difference of the levels of the two ends, and dividing the ſame by the number of chains that the plane is to be long, for obtaining the fall which is to be allowed between each pair of ſtakes, inſtead of a link as before aſſumed. In ſetting out a ſingle rail-way, it will be neceſſary, at proper intervals, to allow the width of land proper for a double rail-way, for a ſhort ſpace, in order to form paſſing-places for the waggons that are coming different ways. As part of the rail-way will in moſt caſes be conducted along the ſide of a hill, or on ſide-lying ground, it will be neceſſary to conſider the ſame in calculating to diſpoſe of the ſtuff, and for the neceſſary ditches and drains for intercepting the ſprings and ſurface water in every inſtance, ſo that the ground of the rail-way may at all times remain dry. The draining, fencing, and bridges, will require to be done on the principles which we ſhall further on explain reſpecting canals; and the embankments, culverts, or tunnels, which may be neceſſary for preſerving the proper ſlope in all places, are alſo to be done on ſimilar principles to thoſe of canals before treated of. It may be proper here to mention, that Mr. *Robert Fulton,* in his *Treatiſe* before quoted, pages 82, &c. has ſuggeſted and deſcribed different kinds of caſt iron bridges for paſſing rail-ways over valleys, either level acroſs, down one ſlope, and up the other of the valley, or riſing obliquely up; in the firſt and laſt of which he propoſes to avoid any ſolid platform or top for carrying the horſe path, and to tow or drag the waggons over this open rail-way, by an endleſs rope or chain, paſſing over a pulley at each end, which can be ſet in motion by a windlaſs, a deſcending weight, or other power. On the approach to a river or yard, where conſiderable quantities of coals or other minerals are to be diſcharged, it will be proper to keep the rail-way upon a high level, by embankment, or on arches, or on a ſtage of timber, that the waggons may be diſcharged from the top of a ſtaith or ſtage into ſhips or boats, or into carts and waggons, without being moved by manual labour. Rivers, brooks, or hollow roads, muſt be croſſed on bridges whoſe tops are formed to the regular ſlope of the plane; and where roads croſs the intended rail-way, they muſt either be raiſed ſo as to be carried over, or ſunk ſo as to paſs under the ſame; or be made up to the ſame height; and the rails muſt, in that part, have ribs of leſs height and greater ſtrength, and the whole muſt be ſo firmly embedded on maſonry, that the heavieſt carriages, in croſſing, cannot damage it: an inſtance of which may be ſeen in Wandſworth town ſtreet, and at ſeveral other places on the *Surry iron rail-way.*

A conſiderable facility is occaſioned in the *conſtructing of Rail-ways,* after the plan of the whole is ſettled, the act paſſed, the land purchaſed, the work ſet out, and the ground levelled and properly ſettled, by being able to begin in any part where ſtone, gravel, and other materials that are wanted are to be moſt conveniently had, and to work from thoſe places without the heavy expence of common cartage, except for the iron rails or blocks of ſtone for ſleepers, if ſuch are not found upon the line.

We will therefore ſuppoſe the work to begin at ſome point where the line interſects a rubble rock or a bed of good gravel, and the ſurface of the road is to be covered therewith for about a foot thick, and the ſame is to be nicely levelled, and any great or rough and out ſized ſtones ſhould be carefully picked or raked off, that the whole may the ſooner ſettle down and become one compact maſs; theſe large ſtones may be thrown forward upon the unformed part of the road, to be covered with ſmaller and better gravel. This covering of rubble or gravel muſt be nicely raked and levelled and beat or rammed down, to make it as compact and ſolid as poſſible. A great quantity of blocks of hard and durable ſtone muſt be got in readineſs, from 8 to 12 inches thick, and weighing 150 to 200 lb. each; the ſhape of them is not very material, ſo that the bottom is flat, to bed firmly and evenly on the gravel, and the top is to be chiſelled to a level to receive the ends of the iron rails; in the centre of this flat part a hole muſt be drilled about 1½ inch diameter, and 6 inches deep. Two flat and ſtraight gauges of iron muſt be provided with pins riveted into their ends to ſuit the holes in the ſtones; the pins on theſe gauges ſhould be at the exact diſtance on one of them to ſuit the length of the iron, generally three feet, and the other to ſuit the diſtance of the rails apart or breadth of the road, uſually about 4 feet. One of the ſtones being laid in the proper place for the beginning of one ſide of the rail-way, and nicely bedded and rammed down upon the gravel, another ſtone is to be laid at 4 feet diſtance for the other ſide of the road, and for bringing them to the exact diſtance and level, the pins of the breadth-gauge are to be entered into the holes in each ſtone, and a common or maſon's level is to be applied to the top of the gauge; if the ſtone laſt laid is found too high or two low, it muſt be lifted up again, and gravel muſt be raked out, or more fine and good gravel ſprinkled in and rammed down, until the right height is obtained; the ſtone is then to be laid on again, and brought to its proper place by means of the gauge and level; care is to be taken that the top of the ſtone is level, ſo that the flat ends of the guage bed exactly and evenly on the ſtone all around the hole; and if this is not the caſe the chiſel muſt be uſed to take down any irregularity and produce this bedding of the gauge bar. A third ſtone is then to be laid on one ſide and the length-gauge pins entered into the holes, by which the exact and proper diſtance of the ſtones will be aſcertained, and for trying the truth of this ſtone as to height, a level is to be uſed, in which a line is very carefully drawn by the engineer, making the exact angle with the perpendicular line that the rail-way is to make with the horizon; this being applied upon the length-gauge will ſhew whether the ſtone laſt laid requires more gravel under it, or any to be taken out, obſerving always to level the gravel carefully and to ram it down, and alſo to ram the ſtone down upon the gravel, before each ultimate trial of its proper poſition as to level, its diſtance meaſured by the gauge from the other ſtone, and its range by a line ſtretched in direction of the intended rail-way. With theſe precautions the ſtones are to be ſucceſſively laid, and gravel of the beſt quality, and without any large ſtones, is to be laid in, to fill up the ſpaces between them; and ſome on the outſide of the ſtones, the better to ſecure them in their places; and when a certain length is done, as no mortar or other ſoft material is uſed which requires time to dry or ſet, the work is ready to receive the rails, and will be then immediately fit for uſe, to carry forward the gravel, ſtones, and other materials for the work as it proceeds. We have before mentioned that the ground work ſhould be ſettled; and for this purpoſe the levelling of the road ſhould be performed early in the winter, and the rains and froſt will effectually ſettle it, by the time the work gets dry enough in the enſuing ſpring;

before which, the work ſhould be carefully gone over again, to level and fill up any parts which have ſettled more than was expected and allowed for.

The *caſt Iron Rails*, in the earlier uſe of them, as on the extenſion of the Caldon branch of the *Trent and Merſey* canal, to Mr. *Gilbert*'s lime-works, 4 miles in length, (which was in uſe long before 1794,) were faſtened down upon longitudinal rails of wood, which lay acroſs ſeveral wooden ſleepers, embedded in the gravel, as we have deſcribed above; theſe rails were three feet long, and had two holes, at 18 inches apart, to receive the wooden pins which faſtened them down, or rather confined them in their places, on the wooden rails: (ſee *fig.* 31, *Canals, plate* iv.) at one end there was a triangular projection, and at the other a ſimilar notch which fitted into each other; a rib ſtood up along one ſide, to confine the waggon wheels to the track; and oppoſite the holes, the rail which was about 1¾ inch thick and weighed about 42 lb. was made wider to ſtrengthen that part; yet, with this precaution, ſuch rails were very liable to break in two at the pin holes, as well as to looſe their connecting triangular piece; the rib alſo was very liable, by the wheels or other things ſtriking againſt it, to get broken off near the ends, and the waggons were not confined from running off the road in ſuch places. The rails of the *Surrey Rail-way* are repreſented in *figs.* 32 and 33, and are, we believe, of the moſt improved conſtruction; they have their ends reſting on ſeparate blocks of ſtone embedded in the gravel as above deſcribed, and, inſtead of pin-holes through them, each rail has a ſimilar rectangular notch in its end, which, when two of them are laid cloſe together, forms a counter-work-hole for a ſquare and headleſs ſpike of iron, that is to faſten the ends of both the rails. Theſe rails conſiſt of a rectangular plate of caſt iron, 3 feet 2 inches long, 5 inches broad, and 1 thick; a piece of metal about half an inch thick is added in the caſting, to increaſe the thickneſs at each end for 5 or 6 inches in length, where it is to bear on the ſtone and receive the ſpike; a rib is caſt on to each edge of the rail, one of them above, and ſerves to guide and confine the waggon wheels; the other below for adding ſtrength; theſe ribs which are about three-fourths of an inch thick form by their top the ſegment of a large circle, being about 3¾ inches high in the middle, and about 1½ inch at the ends, by which theſe ribs are calculated to give the greateſt ſtrength to the rail in the middle, where it has no bearing, and to make them not to be eaſily ſnipped or broken off, as mentioned of thoſe rails above, whoſe ribs are of an equal height throughout; ſmall circular projections of metal are caſt on to the width of the rail near each end, and the ſame are carefully bedded upon the ſtone, for preventing the rail from being overturned laterally, by the action of the wheels againſt the rib. For croſſing of common roads, the rib, (ſee *fig.* 34,) is made only an inch high throughout, and near an inch thick, and its edges are well rounded off. In theſe ſituations, a few rows of pavement, of good ſquare ſtones, ſuch as the carriage way of the ſtreets of London are now paved with, are kept nearly or quite as high as the ribs of the rails, by which the heavieſt waggons, carts, and coaches paſs over them almoſt without any ſenſible jolt. Croſſing-rails are uſed at every paſſing-place, or point where waggons are to paſs out of one track of rails into another, which are very numerous in the company's yard, by the ſide of their baſon or dock for barges, in order that empty waggons or thoſe loaded may be readily puſhed into one of the tracks further off the wharf, to let other full or empty ones advance, on their proper track, to the ſides of the barges. A B C D, *fig.* 35, repreſents one kind of croſſing-rails, ſhewn in connection with four common rails, parts of which are repreſented by E, F, G and H; a wedge or tongue of wrought iron, I, is moveable round a pin, and is repreſented in the figure, as placed againſt the ſtub K, ſo that the track from G to F is clear for one of the wheels of a waggon; and by moving the wedge I till it reſts againſt the ſtub L, the track from H to E would be clear; before the waggon can paſs in the directions above-mentioned, the wedge will often want moving by hand to the proper poſition, but in going in the oppoſite direction from E to H, or from F to G, the action of the wheel againſt the wedge will always move it into the right poſition; there is a circular guard or ſtub caſt on to the rail behind the joint of the wedge for preventing the wheels from ſtriking directly againſt the end of the wedge.

The method in which the rails are faſtened to the blocks of ſtone on which they reſt, is by an octagonal peg or trunnion of good ſound dry oak, fitted to the hole in the ſtone, ſo as to drive eaſily into the ſame, otherwiſe its ſwelling by wet and the driving of the ſpike might ſplit the ſtone, this plug of wood is not long enough to reach the bottom of the hole, and is ſawed off even with the top of the hole; a hole is then bored through this plug of wood, and an iron ſpike with a flat point, and a head juſt fitted to the counter-ſunk notch in the ends of two rails, when applied endways together, is drove; by which the rails are ſufficiently confined, and yet in caſe of any wear or ſettling of the ſtone, ſo that the rail gets a little looſe, it is capable of moving that ſmall ſpace without breaking out the ſides of the pin-hole in the rails. It will be proper, always to drill a ſmall hole from the bottom of the plug-hole, quite through the ſtone, for the rain water to ſoak away into the gravel, otherwiſe the freezing of water in the holes would often burſt the ſtones. Care muſt be taken from time to time, to keep the tread or ſurface of the rails clear of dirt or ſtones, which laſt would ſtop the waggon, and perhaps break the rails; and too much pains can hardly be taken by raking and ſorting the gravel, for the finiſh or top of the road, and rolling or ramming of it down, to ſettle the ſame into a compact and hard road as ſoon as poſſible, having no looſe ſtones, which the horſes are always kicking on to the rails, and while this is the caſe, the man who attends the waggons ſhould always go before his horſe, and look carefully to the rails, and remove any ſtones that may have got upon them. The waggons in moſt general uſe on the *Surry iron Rail-way* weigh, including their loading, about 3¼ tons, the wheels are two feet five inches high, of caſt iron, with 12 ſpokes, which get wider as they approach the hub, which is eight inches long to receive a ſmall wrought iron axle; the fellies or rims of the wheels are two inches broad, and nearly as much thick, and the ſharp angles are rounded off, ſo that theſe wheels are capable of being uſed without damage on any hard common road; a very principal advantage attending the modern uſe of rail-ways. The axles of the wheels are fixed at two feet ſeven inches diſtance; the bodies of theſe waggons are ſeven feet nine inches long, four feet five inches wide, and two feet four inches high; theſe are uſed for bringing down chalk from the Surry hills to make lime, carrying back manures, &c. The founders, and others upon the line, have trucks or waggons of different kinds to ſuit the nature of their goods; the only apparent limitations being in the width of the wheels and carriage, the length of their axles, and weight of lading.

For the more ready emptying or ſhooting the contents of the waggons into barges lying in the dock, a ſtrong ſtage is erected on the wall, which projects over the water, and in order to turn waggons ſhort round and back them on to this ſtage, the rail-way paſſes over a large circular plate of caſt iron, which is ſuſpended on a pin beneath its centre; there being a circular ring under its circumference, which moves round freely, with a conſiderable number of ſmall wheels or rollers, whoſe axles are fixed therein, (ſee *figs.* 45 and 47, *Plate* VII.) upon another circular iron plate firmly fixed below; by this arrangement, it happens, that as ſoon as the fore and hind wheels of the waggon are advanced on to this circular plate, a very ſmall force applied to the waggon will turn it a quarter round, along with the plate and rails on which it reſts: the waggon is then run backwards off the plate, on the ſtage before mentioned, and its contents are ſhot into the barge below; it is then returned upon the plate, and the ſame is turned round until the rails thereon match the track, and the waggon can then move forwards, to make way for another loaded waggon, to be emptied in like manner, or it can be ſhoved backwards to a croſſing-place, as may be required. A ton weight or more in a waggon can eaſily be ſhoved along by a man, as he does a wheel-barrow. Rail-way branches are capable of being conducted into every foundery, or other great work near the line, to terminate under their large cranes for hoiſting goods, ſo that heavy articles can be loaded at once on to trucks for the rail-way. The branches of a rail-way admit of being multiplied almoſt without limit; farmers and others who have but an occaſional trade, may have their own waggons to be kept locked, and left for them by the ſide of the rail-way, one or more at a time, from the gang that is paſſing along the line. About November 1800, Dr. *Anderſon* recommended, in his *Recreations*, vol. iv. p. 204, the adoption of a double rail-way for heavy carriages between London and Bath; and about March 1802, Mr. *R. L. Edgeworth* recommended, in *Nicholſon's Journal*, 8vo. vol. i. p. 221, the experiment to be tried, on one of the great roads, for ten miles or more out of London, of a rail-way with four tracks, one for ſlow and another for faſt travelling carriages going each way, in order to avoid meeting or delay; theſe he propoſes to adapt to chaiſes and ſtage coaches, by means of low cradles or platforms, with wheels adapted to the rails, on to which a chaiſe, coach, or other carriage, could be drawn, and there confined, in order to be drawn along the rail-way; and which cradles the coaches might leave at any deſired point, to be drawn on the common road, which he propoſes to have by the ſide of his rail-ways. Dr. *Anderſon*, in the volume above quoted, recommends rail-ways to be made from the docks in the Iſle of Dogs, to different points in the environs of London; and he propoſes the bodies of theſe rail-way waggons to be moveable, and to be hoiſted off by cranes with their lading in them, and be placed on other, and larger wheels, with ſhafts adapted to the ſtreets; which, after delivering their lading, would return, perhaps laden with other goods, to the cranes to be replaced on the rail-way wheels. In vol. v. p. 291, of the doctor's work, it is recommended to uſe waggons on the propoſed rail-way with wheels large enough, and of a proper conſtruction, to be uſed in the ſtreet alſo. Wherever any conſiderable work is to be done, as in the excavation of the *London-Docks*, it has been found to anſwer, to lay down temporary rail-ways; and ſuch as admit of being moved as parts of the works become complete. For the uſe of mines, this facility of removal is often of conſequence, as the veins or pits wear out.

Doctor *Anderſon* obſerves, that 20 tons, in a barge upon a canal, will be drawn with eaſe by one horſe, travelling at the uſual rate that waggons move; and that on a rail-way the ſame horſe would, under favourable circumſtances, tranſport the ſame quantity of goods in a given time: but Mr. *Fulton* ſays, that five tons to a horſe is the average work on rail-ways, deſcending at the rate of three miles per hour; or one ton, upwards, with the ſame ſpeed. Mr. *Telford* obſerves, that on a rail-way well conſtructed, and laid with a declivity of 55 feet in a mile, one horſe will readily take down waggons containing 12 to 15 tons, and bring back the ſame waggons with four tons in them. Mr. *Joſeph Wilkes* in 1799 ſtated, that a horſe of the value of 20l. drew down the declivity of an iron road $\frac{5}{10}$ of an inch at a yard, 21 carriages or waggons, laden with coals and timber, weighing 35 tons, overcoming the *vis inertiæ* repeatedly with eaſe. The ſame horſe, up this declivity, drew five tons with eaſe. On another part of the road, where the acclivity was $1\frac{3}{4}$ of an inch at a yard, the ſame horſe drew down three tons; but it was neceſſary to ſlipper or lock the wheels here, to prevent his being overpowered by the deſcending weight. On a different rail-way, one horſe, value 30l. drew 21 waggons of 5 cwt. each, which, with their loading of coals, amounted to 43 tons 8 cwt. down the declivity of $\frac{1}{3}$ of an inch in a yard; and up the ſame place, he afterwards drew ſeven tons; the cwt. in all theſe experiments of Mr. *W.*'s being 120lb. In the ſummer of 1805 a trial was made on the *Surry* rail-way by Mr. Bankes, wherein a horſe, taken indiſcriminately out of a team, drew 16 waggons, weighing upwards of 55 tons, for more than ſix miles along a level or very ſlightly declining part of the rail-way.

Dr. *Anderſon* has calculated the expence of carrying goods in common waggons, or turnpike roads, a diſtance of eight miles, at 5s. 4d. per ton, and of carriage, the ſame diſtance, on a rail-way, at 4d. per ton, or only a tenth part of the former. *Recreations* iv. 208.

For ſteep deſcents, ſledges, or ſlippers of iron, muſt be provided, ſimilar to thoſe in common uſe with road-waggons, which can be placed under the wheels of the rail-way waggons, and hooked to the ſide of the waggon by a ſhort chain, in order to cauſe the wheel or wheels to ſlide upon the rails, whereby the tendency to deſcend may be checked.

Mr. *William Chapman* has, in his *Obſervations*, p. 42 and 54, recommended the uſe of waggons, that are to run on to the rail-ways that are to be prepared in the bottom of a flat-bottomed boat, inſtead of unloading the contents of the waggons into the boat; and when this boat with its waggons has arrived at its deſtination, the waggons are to be run out upon other rail-ways, to proceed forwards by land if neceſſary.

Mr. *Carr*, we are told, has introduced in the mines of Shropſhire, and other places, a ſlight kind of iron rail-ways, called train-roads, for the uſe of very ſmall waggons in their under-ground works.

Mr. *R. L. Edgeworth* has ſuggeſted (*Nicholſon's Journ.* 8vo. i. 223,) the uſe of light circulating chains running upon rollers, which are to be put in motion by ſmall ſteam engines placed at conſiderable diſtances; to theſe chains he propoſes carriages to be attached, for dragging them along upon rail-ways inſtead of uſing horſes. Since ſteam-engines have been brought into uſe, to work by the expanſive force of ſteam, and requiring no water for condenſation, a ſucceſsful trial of applying them to moving the trams on a tram-road has been made, *viz.* in February 1804, on the *Cardiff and Merthyr* rail-way, where 10 tons of iron (long weight) loaded on tram-waggons, with the additional weight of about 70 perſons for great part of the way, were drawn for nine miles upon the tram-road, at the rate of near five miles per hour, by the uſe of one of theſe ſteam-engines fixed on its own waggon made by Mr. Homfray, (for which engines Mr. *Trevethick* had previouſly taken out a patent, though it is perhaps an old invention) no ſupply of water for the boiler being found neceſſary in this diſtance.

The coſt of a ſingle rail-way, with croſſing-places, for a deſcending trade, was eſtimated by Mr. *Fulton*, who wrote in 1795, at about 1600l. per mile. Mr. *Wilkes*, in 1799, ſtated, that the expence of completing a mile of ſingle rail-way, where materials of all deſcriptions lay convenient, and where the land lies tolerably favourable for the deſcent, would be about 900l. or 1000l. fenced, &c. excluſive of bridges, culverts, or any extra expence in deep cutting or high embankments. Dr. *Anderſon* mentions, in 1800, the ſum of 1000l. per mile as the probable coſt of a double rail-way in the moſt favourable ſituations, and of very ſtout ones in the vicinity of London, where labour is dear, not leſs than 3000l. per mile; and Mr. *Wilkes* ſays, that wherever the quantity of goods to be conveyed on a rail-way, having a deſcent of not more than ½ an inch in a yard, amounts to two-thirds of downwards, and one-third of upwards loading; it is a doubt, if it will not, in that caſe, be a cheaper conveyance than by a canal, beſides the rail-way being more certain, where diſpatch is neceſſary, on account of froſt and dry ſeaſons. Another advantage attending rail-ways is, the greater certainty of the eſtimates for the ſame, when made with care and judgment, and the facility with which the whole work may, in general, be contracted for, to be completed at a ſtated time. The principal rail-ways which have been executed, are the *Cardiff and Merthyr*, the *Caermarthenſhire*, the *Sirhowy*, the *Surrey*, and the *Swanſey and Oyſtermouth*; and ſuch branches will be found to the *Aſhby de la Zouch*, *Cromford*, *Derby*, *Erewaſh*, *Lancaſter*, *Leeds and Liverpool*, *Peak Foreſt*, *Shropſhire*, *Somerſet Coal*, *Trent and Merſey*, and ſeveral others, to which number almoſt every day is adding.

The *conſtructing of Bridges* for croſſing canals and navigable rivers, often occaſion a very ſerious part of their whole expence, and this circumſtance occaſioned the attempt in ſome of the earlier canals, to ſubſtitute paved *fords* in many inſtances; Mr. *James Brindley* propoſed theſe at firſt, for ſome places on the *Trent and Merſey* canal; and on the canal which Mr. *Davis Dukart* conſtructed to the Tyrone collieries in Ireland, theſe were ſubſtituted in place of bridges. Mr *Fulton* has recommended the general adoption of fords on his ſmall canals, but Mr. *Chapman* obſerves, that the water in ſuch caſes muſt not exceed two feet nine inches in depth, as otherwiſe hay, ſheaves of corn, &c. in common carts would be liable to get wet in croſſing. On the China canals we read, that there are elliptical arches of ſtone over their canals, the longer axis being vertical, and high enough for the maſts of their veſſels; theſe bridges being only intended for foot paſſengers, and are aſcended and deſcended by ſteps. On our canals, bridges for foot paſſengers only are generally conſtructed of wood, and are mounted by ſteps, as at Paddington on the *Grand Junction*. In all large and important bridges the arches ſhould undoubtedly be ſo formed that the materials thereof are in equilibrium, independent of the cement that may be uſed between the ſtones or bricks; the principles of which arches will be found in our articles ARCH and BRIDGE; but for the common bridges for croſſing of canals, which are wanted in ſuch great numbers, flat ſemi-elliptical arches have been, in general, adopted, on account of ſuch giving width for the canal and towing-path underneath, without raiſing the top any unneceſſary height, which ſo enhances the expence of landing up, or forming the ſlopes to the bridge. From the habits which neceſſity has in a great meaſure introduced with canal bridge-makers, of uſing only the beſt materials, performing the work with great care, and not ſtriking their centres too ſoon, ſuch bridges are found to ſtand tolerably well, although very far removed from an equilibration figure; yet inſtances are not wanting on moſt canals of their ſettling, and even falling down in ſome caſes. A kind of brick bridges have long ſince come into almoſt general uſe on canals, of which we have given a plan, ſection, and perſpective view. See CANALS, *Plate* IV. *figs.* 40, 41, and 42. The form of theſe bridges is well calculated for ſaving of materials, and giving ſtrength at the ſame time, the whole of the walls being more or leſs battering, and the ſide walls are ſplaying outwards at their ends, to make the entrance on to the bridge the more eaſy, by which the ſide walls are rendered curving inwards in every part. In the building of bridges the utmoſt care muſt be taken to ſink the foundations down to ſound ſtuff, or to drive piles on which to begin the work; it is a good practice to have wedge-like or arching bricks made, on purpoſe to uſe after a certain number of courſes of key bricks, or thoſe forming the ſofits of the arch, and to introduce oblique courſes of bricks for the more effectual tying of the work together, as we have mentioned in ſpeaking of tunnels. Large bricks made of the beſt earth and well burnt, ſhould alſo be uſed, placed on edge upon the top of the walls of the bridges, as a coping, unleſs very good ſtone is near at hand, the top corners of the coping bricks or ſtones ſhould be carefully rounded off in the making, in order that the ſame may preſent as few angles as poſſible for the weather or the traffic to catch hold of.

We have before mentioned the care which ought to be taken in every inſtance, to find ſtuff with the leaſt poſſible expence of moving it, for landing up the bridges; from theſe having, in ſome inſtances, been left too ſteep for the convenient and ſafe uſe of the public; it has not been uncommon, in later acts, to make proviſions on theſe ſubjects; on the *Grand Weſtern* it is enacted, that the aſcents to the bridges ſhall not exceed 2½ inches in a yard, and on the *Wilts and Berks* this riſe is limited to 3 inches in the yard at the moſt. The width of the carriage-way, on the bridge, in the narroweſt places, is alſo fixed in ſome acts, wherein we have ſeen 12 feet mentioned as a limit in ſome caſes. We have before obſerved, that the canal ought, if practicable, to be conducted into deepiſh cutting, wherever a brick or ſtone bridge is to be erected, in order that the ſtuff may be thereby procured, for landing up each ſide of the bridge, and that the abutments of the bridge may be the more ſolid, and the foundations more likely to reach ſound ſtuff, without an extra depth of walling, or the neceſſity of piling for ſuch purpoſe. On this account it is, that the tail of a lock generally preſents a proper place for a bridge, and where the walling, which muſt have been made for wing-walls, below the lower lock-gates, is avoided, or turned to account in the bridge. In places, where from the great traffic that is to be expected, or other cauſe, a towing-path will be wanted on both ſides of the canal, the bridges ſhould be made on a ſcale large enough to admit of a towing-path on both ſides under the bridge, as in the two or three bridges neareſt to Paddington baſon, on the *Grand Junction*.

For *occupation*, or accommodation bridges, and even on ſome public roads, as on the *Sankey* canal, and others, a kind of ſwing or ſwivel bridge has in general been adopted, of which ſome mention has been made under our article BRIDGE. See *fig.* 43 *Canals*, *Plate* VII. A flat platform of wood ſtrongly framed together, covered with planks, and having ſide rails, is prepared, wide enough for the purpoſes of a bridge, and about half as long again as the canal is wide, in the contracted walled part intended for the ſwing bridge. One end of the platform for this bridge is framed as light as can be conſiſtent with ſtrength, and the other very heavy, with proviſion for ſtowing large ſtones or pigs of caſt iron therein, ſo that the ſame will reſt in equilibrio on a point at about one-fifth of its length from the heavy end; under this point, a large circular plate or ring of caſt iron is fixed, having a ſmooth circular hollow ſunk therein. An exactly ſimilar plate is embedded, and firmly fixed on the ſolid wall at the ſide of the canal, except that this laſt has a ſtrong iron centre or point ſtanding up, to enter a hole ſunk in the upper plate to receive it. On this pin the bridge is ſuſpended in equilibrio, and in order that no impediment may ariſe to turning the bridge round, when its balance is by any circumſtance deſtroyed, a number of ſmooth caſt iron balls, of two and a half or three inches diameter, are placed in the circular groove or hollow ring in the two plates, which act effectually as rollers for leſſening the friction between the circular plates, in turning the bridge on and off the canal; or, a ring containing ſeveral rollers (*fig.* 45 and 47), is ſubſtituted inſtead of the iron balls above-mentioned, between the lower and upper plates *figs.* 44 and 46. A receſs is formed on the bank juſt to receive the bridge, when a boat is to paſs, and when the bridge is turned acroſs the canal, each end of the bridge (which ends are rounded into circular arcs, ſtruck from the centre pin), ſlides on to a ſimilar circular receſs in the road, with a firm bearing at a very ſmall diſtance below the ends of the bridge, when it is in equilibrium, on the centre pin and balls or rollers; by this arrangement it happens, that the heavieſt loaded carriage croſſing the bridge, is not able to depreſs either end of the bridge on which it paſſes, in any ſenſible degree. The engineer ſhould carefully avoid the uſe of theſe ſwing, or indeed of any moveable bridge, where the towing-path is to change from one ſide of the canal to the other, becauſe the bridge muſt remain acroſs the canal until a barge in paſſing, is got near enough for the towing-horſe to croſs over the bridge, and the bridge muſt then be turned off the canal before the boat can paſs, and it continually happens, unleſs the towing-line is of great length, or is caſt off at ſome diſtance before the boat arrives at the bridge, or the greateſt dexterity is uſed, that the boat ſtrikes the bridge before it can be turned off the canal into its receſs: where ſeveral boats are cloſely following each other, there difficulties are much increaſed, and great delay muſt take place, or the bridge will ſoon be knocked to pieces. Swivel or turn bridges have ſometimes been erected on the towing-path ſide, but they form there a moſt ſerious obſtacle to the towing of boats; and on that account are generally placed on the off bank, and as no methods have hitherto been brought into general uſe, of turning on or ſhutting ſuch bridges for perſons to paſs over them, except the perſons, or ſome others, are at the time, on the ſame bank of the canal on which the bridge ſtands, in order to turn it over the canal; this has occaſioned the neceſſity of clauſes in every act, or ſet of bye-laws, requiring boat-men always to ſhut to every ſwing-bridge, or draw-bridge, as ſoon as their boat has paſſed. The great loſs of time and labour in thus continually turning the bridges on and off, the wear that ſuch continual uſe occaſions, and the frequent damage which ſuch bridges ſuſtain from boats ſtriking againſt them, if, by the leaſt delay of the boat-men or accident, they are not turned off before the boat gets up; have occaſioned our thinking a good deal on the ſubject, in hopes of deviſing ſome method of turning the bridge on when wanted, from either ſide of the canal; becauſe ſuch a contrivance would authoriſe the alteration of the preſent regulations, and require each ſwing-bridge to be left open, and out of the way of the navigation, except during the time that it was actually in uſe, by perſons or carriages paſſing over it: another material evil would thereby alſo be remedied, that is, the difficulty which now exiſts of preventing the farmers' cattle, in the fields on the off ſide of the canal, from paſſing over the bridges, and eſcaping along the towing-path, without an expenſive circle of fencing and a gate to ſeparate the bridges from the fields, for no gate or obſtacle can conveniently be made on the towing-path ſide to obſtruct their paſſage. Chains and pulleys under the canal, and motion conveyed upon *Bramah*'s patent principle, in pipes under the ſame, were conſidered among others, as the means of turning the bridge on, when wanted; but, our ſpeculations hereon were, happily, at the moment of writing this (October 1805,) interrupted by the information of a method, which was ſucceſsfully brought into practice very lately, by Mr. *Benjamin Bevan*, the engineer upon the middle diſtrict of the *Grand Junction* canal, *viz.* near the ſteam-engine on the Wendover branch, where a ſwing-bridge of the common conſtruction, with a railing or fence on each ſide of it, has an addition made to it, on the ſide that is next the canal when the bridge is open, or in its receſs, at about three-fourths of its length, from the centre pin on which the whole turns; this conſiſts of a jib like that of a crane, or the bars that are ſometimes uſed for ſtopping carriages at the ends of ſtreets: an upright piece of wood is hung by two hooks and thimbles, like thoſe of a common gate, to the ſtandard or upright on the ſide of the bridge; to the top of this a rail of 4 or 5 feet long is fixed horizontally, ſupported by a brace underneath, from near the bottom of the upright piece; on the top of the horizontal piece are two ſtrong ſtaples fixed, adapted to receive the thickeſt end of a very ſlender and light pole, ſuch as are uſed for the handles of hay-rakes, but they muſt be longer, and rather larger for wide canals; a nail drove in between the ſtaples through the pole fixes the ſame, and makes it form a light and eaſily renewable continuation of the top rail quite acroſs the canal, ſo that a perſon, wanting to croſs the bridge from the towing-path, can take hold of the end of the pole and pull by the ſame, and thereby turn the bridge over the canal; or, if a perſon has croſſed the bridge towards the towing-path, he can with equal facility take hold of the end of the pole and ſhove the bridge round to the other ſide. The hinges of the jib that carry the pole are ſo adapted, that the pole has a tendency to hang directly acroſs the canal, to the moſt convenient point for being taken hold of; but, at the ſame time it is with the leaſt force turned round on its hinges until it is brought along-ſide of the bridge, and quite out of the way of boats that are paſſing. This very ſimple and cheap apparatus, we are told, anſwers effectually; no impediment is offered to the horſe or towing-line; but when a boat arrives, whatever part thereof ſtrikes againſt the pole, it recedes and ſuffers the boat to paſs, and then by its own weight reſumes its ſituation acroſs the canal, ready for turning the bridge. The ſolid part of the jib is not made long enough to be liable to be ſtruck by the boat, or a man ſtanding thereon; and poles in plenty, of the proper ſize and length, can be in readineſs, for replacing in a minute any pole which is worn out or broken by accident.

Bridges which have no towing path under them, preſent a great obſtacle to towing, becauſe the line muſt in thoſe caſes be caſt off from the barge; except, occupation bridges, like the wooden one at Rotterdam in Holland, could be introduced, where the bridge, we are told, conſiſts of two ſeparate ſegments, each ſupported firmly on its own bank, and leaving a ſlit quite acroſs the bridge for the towing-maſt to paſs through, and thus they avoid caſting off of the line: this ſlit need not be ſo wide but that foot paſſengers can with eaſe and ſafety ſtep acroſs it; and, on the paſſage of horſes or carriages, a moveable flap turning quite flat back upon hinges, might be turned over to complete the road.

Where ſwivel bridges of great width and ſtrength are required, and need but ſeldom to be turned off, as for admitting ſhips at high water to the *Weſt India* and *London Docks*, double wooden or caſt iron ſwivel bridges are in uſe, with a moveable frame under each part, conſtituting parts of the ribs of the bridge, which frames turn on a hinge or joint, and are taken up or ſuſpended by a ſcrew at the other end, to clear the walls of the bridge when the ſame is to be turned off; and which, when the bridges are turned over to meet in the middle, can be let down by turning a winch, ſo as to fall in ſtrong grooves prepared in the copings of the walls, and complete the abutments of the ribs of the bridge, as ſtrongly almoſt as a fixed wooden or iron bridge could be made; an excellent example of which may be ſeen in Wapping ſtreet, croſſing the entrance to the *London Docks*, as mentioned under the article Bridge. It appears that Mr. *H. Shadwell* was rewarded for ſome improvements to ſwivel-bridges which he ſuggeſted to the *Society of Arts*. See their *Tranſactions*, vol. xiii. page 227.

*Draw-Bridges* are not uncommon as accommodation bridges on ſome canals; the frame or platform of them, with their ſide rails attached, is moveable on ſtrong hinges upon the top of the wall or one ſide of the canal, and when down ſhuts into a groove prepared on the oppoſite wall, ſo as to preſent no projection or obſtacle to the road over it. For raiſing theſe bridges, two ſtrong and tall poſts are fixed upright on the bank of the canal a little behind the hinges of the bridge; on the top of theſe poſts are two very long and tapering pieces of timber called balance-beams, which turn on a hinge near their middle, their ſmall ends being connected by chains to the further end of the bridge, to which the thick ends of the balance-beams are made to be a counterpoiſe, by means of lead or iron nailed on to the ſame if neceſſary: when the bridge is ſhut, or prepared for paſſing over, the balance-beams reſt nearly horizontal, there being a chain attached to the thick end of each, which hang down and can be reached by a man or boy, and by pulling at which, he can rear the bridge up upon its hinges for boats or veſſels to paſs. For croſſing the Docks in Liverpool in different places, very large draw-bridges are in uſe, ſuppoſed to be the largeſt in England. But we are informed by Mr. Rennie, an engineer of the firſt eminence, that he has ſeen much larger draw-bridges in France. On the *Forth and Clyde* canal the draw-bridges are double, meeting in the middle of the canal when ſhut down. It appears that the Chineſe have a ſort of draw, or rather ſliding bridges over the piers of the flood-gates of their canals, which, to prevent interruption to the maſts of veſſels, are conſtructed ſo as to be eaſily withdrawn when veſſels are about to paſs; they are flat wooden bridges, narrow and light, reſting on rollers fixed in their frame, and running on a couple of looſe ſpars that are withdrawn after the bridge. Wooden bridges are very often wanted for carrying the towing-path over the entrances to docks, or the ſide branches of a canal, and from their great ſpan, to avoid a narrow place at the turning; theſe are often attended with conſiderable expence; they ſhould be conſtructed of very ſound and durable timber, well truſſed, and as light as is conſiſtent with ſtrength, as they are ſeldom made wide enough to be uſed except by men and horſes. We cannot too often adviſe that bridges of wood or iron, and ſtone ones alſo of large ſpan, ſhould be wider at the abutments, and diminiſh by a proper curvature of the ſides to the middle, to prevent the ſtrain of the materials on a ſudden lateral impulſe, from cauſing them to give way and cripple ſideways.

The ingenuity and enterpriſe of Britiſh artiſts have given riſe within the laſt 30 years to an improvement of the firſt importance to river navigation, by the introduction of caſt iron bridges of great ſpan and height, by the adoption of which, in favourable ſituations, ſhips may be admitted farther up into our large rivers; and in almoſt every caſe, the impediments to navigation may be removed that are occaſioned by the narrowneſs and lowneſs of the arches of our old ſtone bridges, which not only exclude or interrupt the towing-path and neceſſitate barges to lower their maſts, but in general cauſe ſuch a fall in the water, owing to the deficiency of their water-way, as to be dangerous and impaſſable at particular ſtates of the river. Near Coalbrook-dale on the *Severn* river this improvement was firſt carried into effect. particularly deſcribed in our article Bridge. A perfect model of this bridge, which is 100½ feet ſpan and 45 high within the arch, was prepared by Mr. *Abraham Darby*, who caſt the ſame, and preſented to the *Society of Arts*, in whoſe collection it may be ſeen by any one who applies in the Adelphi: ſee their *Tranſactions*, vol. vi. pages 228 and 232. Buildwas bridge of iron over the *Severn*, within two miles of the former, we have already deſcribed in the article referred to, and have only to add, that Mr. *Thomas Telford*, the engineer of this bridge, has given a plate of the ſame in *Plymley's Agricultural Report of Shropſhire*, page 316. For the principles on which the Wearmouth bridge, which we have deſcribed, is formed, Mr. *Rowland Burdon* on the 18th September 1795 took out a patent, which ſee in the *Repertory*, vol. v. page 361, where a view of this very curious ſtructure will alſo be found. We are ſorry to add that we heard lately in converſation, that this bridge has ſhewn ſymptoms of twiſting or giving way ſide-ways, which have greatly alarmed ſome perſons for its ſafety. The caſt iron bridges at Bridgewater on the *Parret* river, and at Staines on the *Thames*, have been mentioned in our article referred to above; the latter, owing to the miſtaken economy of the truſtees, in having vaults made in the abutments, which ought to have been of ſolid maſonry, gave way, and has been entirely taken down, as the new ſtone bridge erected before it, was obliged to be from the ſame cauſe. We cannot enough admire the prudent precautions of the ſelect committee of the Houſe of Commons in 1800, who inveſtigated the different propoſals for rebuilding of London bridge. (See *Tilloch's Philoſophical Mag.* vol. x. page 13.) They conſulted the opinions of the moſt eminent profeſſional men, and had a very accurate ſet of models, conſtructed in braſs by Mr. *Berge*, the ſucceſſor to the celebrated *Ramſden*, under the direction of Mr. *Atwood*, for illuſtrating the nature and properties of equilibrium arches. One of the deſigns which were preſented to this committee, and which has ſince been engraved by Mr. *Wilſon Lowry* and publiſhed, is that of Meſſrs. *Telford and Douglas*, for a ſingle arch of caſt iron of 600 feet ſpan, and riſing 65 feet above high-water mark: as this ſcheme has not yet, nor ever may be carried into execution, it would be ſwelling the preſent article too much to detail the excellent proviſions which the contrivers had made, for the execution and ſtability of this grand work. We proceed, therefore, to mention, that Mr. *Fulton*, in his treatiſe ſo often before quoted, has given deſigns (plates 14, 15, and 16), and explained the principles, page 120, of different bridges of caſt iron. On the 24th May 1796, Mr. *James Jordan* took out a patent for conſtructing bridges which ſhould be ſuſpended from ribs of iron above: ſee *Repertory*, vol. vi. page 220, and on the 7th February 1797, Mr. *John Naſh* obtained a patent for a method of conſtructing bridges of hollow quoins of iron, that can be filled with maſonry or other ſolid matters after the bridge is put together; the piers of bridges he propoſes in like manner to conſtruct of hollow caſes of iron, to be filled with maſonry after they are brought to their proper places: ſee *Repertory*, vol. vi. page 361. Of wooden bridges for large and navigable rivers, we have given an example in the once juſtly famous Schaffhauſen bridge over the *Rhine*, in our article Bridge. Mr. *Fulton* mentions a very famous one at *Wettingen* in Switzerland; and has given us deſigns for bridges for newly ſettled and woody countries, wherein large timbers dowelled together, ſupply the place of key-ſtone, above which the platform for the road is to be ſupported. The ſame gentleman has propoſed in conſtructing the above kind, or iron bridges that are very flat and low, to obtain the neceſſary ſtability of the butments, by continuing the line of key-timbers or ribs with their proper curvature for ſome diſtance into the bank on each ſide. We have before ſpoken, under the article Bridge, of the proper form of the projecting angles of the piers of a bridge, and ſhewn that for navigable rivers, ſharp corners ſhould be avoided, from the damage that ſuch might do to the boats and veſſels.

Bridges will be wanted in the conſtruction of rail-ways for carrying the rail-road over rivers, ſudden valleys or roads; ſome of theſe may require caſt-iron arches; ſome of them muſt be of ſtone or brick; but oftener, ſuch may with propriety be conſtructed of wood, taking care that they are effectually truſſed, or formed on the beſt principles, alſo that the joints are effectually ſecured from wet, and the whole covered with a coating of mineral tar or paint, to be renewed from time to time to keep out the weather. One other thing remains to be mentioned reſpecting bridges, i. e. owing to the contraction of the canal and curvature of the towing-path at a bridge, the towing lines are apt to fret and wear away the corners of the bridges, occaſioning alſo a great waſte in ropes: for remedying this, light hollow cylinders of wood are placed upright, or nearly ſo, according as the wall is upright or battering, at all the corners of the bridges or other obſtructions to the direct line of the towing-path; theſe cylinders being hung on centres or pivots, at top and bottom, they turn round by the action of the rope, and prevent friction and wear.

The *Towing-Path*, horſe-path, or hauling-way of a canal, ſhould always be on the lower ſide if practicable, the traffic on the ſame having a tendency to conſolidate the new made bank, to prevent the accumulation of weeds and the harbour of vermine, that by lodging in and perforating the bank might endanger the ſame. The towing-path ſhould change as little as poſſible from one ſide of the canal to the other, and when this is unavoidable, it ſhould be always done at ſome fixed bridge, to avoid the inconveniencies before pointed out; the change ought never to be made in deep-cutting, as has been done near Tring on the *Grand Junction*. The towing-path ought never to be interrupted if the ſame can be avoided; and, beſides having a way under all bridges (except thoſe where a change of ſides is to be made) we hope to ſee the example followed, which has been ſet at Atcham on the *Shrewſbury*, and Newbold on the *Oxford* canals, of continuing the towing-path through the tunnels, wherever the ſame ſhall appear practicable. On the propoſed *Bude and Launceſton* canal, it was intended to form a towing-path on both ſides; a hint that may prove very uſeful in ſome ſituations of greater traffic, than there ever was likely to be on this canal. It is often provided in the act, that the towing-path may be uſed by the owners and occupiers of land on the line as a bridle-way, or as a drift-way for their cattle; as on the *Aſhby de la Zouch*, *Grantham*, *Leiceſterſhire and Northamptonſhire Union*, *Oakham*, &c. Frequently, permiſſion is given to perſons to uſe the towing-path as a foot-path or bridle-road, and we think it would in ſome inſtances be proper to obtain the power of levying a ſmall toll on horſe paſſengers; if the company ſhould at any future time ſee it right by public notice to permit their towing-path to be ſo uſed. It ſeems inapplicable to the purpoſe of a towing-path, to make public drift-ways of them in any caſe, on account of the damage which looſe cattle would do to the banks and fences, and the impediments which droves of cattle would preſent to the hauling-horſes and lines. In forming the towing-path, care muſt be taken to make the ground ſound, and to cover it with a proper thickneſs of good gravel; and we cannot but recommend the raking or ſorting of this as it is laid on, throwing the large or irregular ſtones forward to be covered with better gravel, ſo that the ſurface may be ſmooth and even, without rough and large ſtones to throw the horſes down, and render the uſe of the path unpleaſant. On the duke of *Bridgewater*'s canal, where proper materials for road-making are very ſcarce, the ſhale and ſlates, or refuſe coals from the mines are brought out and calcined, or burnt in very large heaps, the cinders of which are uſed for making and repairing the towing-paths upon his canal. The height of the towing-path ought not to be leſs than one foot, or more than two or three feet above the ſurface of the water, or top-water line.

The *fencing* of the ſides of a canal is a buſineſs deſerving of more attention than has been uſually paid to the ſame. Quick-ſet or other live fences ought by all means to be made, except in the caſe of a rocky country, where good and durable walls can be built at an eaſy expence: rail or pale fences are very improper, except in and near towns, on account of their heavy expence in repairs. The continual weeding which quick-fences require, the great injury which the plants ſuſtain from weeds, if the ſame are at any time ſuffered to grow up, and the damage which the pulling or hoeing up of weeds ſo repeatedly, do, in wearing away the ſoil, and more or leſs expoſing the roots of the quicks, and beſides theſe, the plants being often wounded in their tender bark by the hoes uſed by the weeders, are moſt ſerious difficulties in the raiſing of quick-fences, wherever our experience has extended, except in the north-eaſtern parts of Norfolk, where the ſpirited and intelligent tenants, that there abound, have a method of raiſing fences, which they are continually doing during the currency of their leaſes, that we are happy, in this inſtance, of being able to mention, becauſe it has not yet, we believe, appeared in print. The line of an intended hedge and ditch being marked out, the firſt ſtep is to collect carefully all the top-ſoil or vegetable mould into a ridge where the centre of the bank is to be, and if this vegetable mould proves too abundant, the extra quantity is thrown into heaps further off, in order to be mixed with dung, or carted to ſome parts of the land, which wants a greater ſtaple of mould. This done, a row of ſpits or lumps of earth out of the ditch are laid carefully in the front of the bank, and on theſe, when reduced to a regular line by paring with the ſpade, the white-thorn ſets are placed a little inclining upwards, at about four or ſix inches apart; care is taken in laying in the ſets, that their roots are bedded in the vegetable mould, that is to form the centre of the bank; when this is done, another row of ſpits or lumps is dug out of the bottom of the ditch, and laid upon the quicks, which being patted down and levelled at top with the ſpade as before; another row of quick-ſets is laid in, taking care that each plant in the upper row is over a ſpace in the lower one, and that their roots are incloſed in the top-ſoil. Other ſods are then dug out of the ditch and piled up, with the proper ſlope or batter, until the bank is raiſed to the intended height; the vegetable mould is then dreſſed up into a regular bank at the back, and the remainder of the ſtuff from the ditch is thrown over, and is afterwards carefully ſpread and laid up againſt the back of the bank, ſo as entirely to encloſe the vegetable ſoil in a caſe of dead earth, or ſtuff taken from below, where cultivation has depoſited the ſeeds, or nature the viviparous roots of ſuch plants. Still further to accompliſh this excluſion of the ſoil in the bank, from the action of the ſun, air, and other ſtimulants to vegetation, at a proper ſeaſon in the ſpring, a quantity of dead earth is pared up from the bottom of the ditch, and worked and chopped about, until it is in the ſtate of *puddle*, before deſcribed. The tops of the quicks are cut off nearly even with the ground, after which, a labourer carefully plaſters every part of the face of the bank with this prepared or puddle-like ſtuff; and after it is laid on, having a pail-full of water at hand, to wet his ſpade in if neceſſary, he works this plaſter about, giving the flat ſurface of his ſpade exactly the circular and plaſtering motions that plaſterers uſe when at work on a ceiling or wall. If it ſhould appear that froſts have mouldered down, or injured the facing of the bank, the ſame is carefully repaired and worked again, as above, before the ſeaſon for the vegetation of the quicks. As ſoon as the white-thorns have put forth their leaves in the ſpring, a careful labourer walks along the ditch, with a knife in his hand, and wherever a plant is miſſing, from among thoſe which have ſhot forth, he digs in the point of his knife with care, to find and releaſe the top of the ſet, which otherwiſe might be ſmothered and confined by the plaſtering of the bank. The benefit of this procedure is inconceivably great, in almoſt totally preventing the growth of weeds, and in confining the moiſture in the vegetable mould from eſcaping in dry ſeaſons. At a time in the ſummer, when every part of the ſurface was covered with vegetation, we have with pleaſure examined ſome miles in length of quicks treated in this manner, and although the quicks had made the fineſt ſhoots which could be imagined, not a veſtige of vegetation of any kind beſides was to be found on the bank; and thus, with proper care in renewing the plaſtering or working of the bank, many of them remain until the quick is grown up to be a fence; and it is almoſt literally true, that weeding is here unneceſſary, although no ſoil can be more congenial to, or worſe ſtored with the ſeeds of annual weeds, than ſome of thoſe were of which we have been ſpeaking. The ditches are made deep, and the ſides of them as ſteep as the ſoil will ſtand in the general, ſo that dead or guard fences are generally omitted on that ſide; and ſo they are often on the other, or back ſide, and a prick-hedge is ſubſtituted, which, with care, and the letting of ſheep only looſe in ſuch fields, anſwers the purpoſe very well. Some time before the bank is made up to the intended height, the labourer goes along upon the top of it, ſhovels off the looſe top, and treads down the top of the bank ſo as to form a flat of perhaps 12 or 14 inches wide; into the centre of this he ſtrikes in his ſpade, and gives the ſame a lunging motion, ſo as to open a narrow and deep notch; this operation he repeats, until a notch of this ſort is opened the whole length of the bank; he then proceeds to ſtick this with ſhort and rough buſhes, ſo cloſe as to make a complete hedge; he then throws up out of the ditch as much ſtuff againſt the buſhes as will lay on the plane or top, in which the hedge is ſtruck, and beats the ſame down ſtrongly with his ſpade; the ſame proceſs is followed at the back of the hedge, by which theſe buſhes are ſo ſecurely ſet into the bank, that they will often ſtand until the quick is become a fence; in places where the deſtructive pilfering of the poor is properly repreſſed. Some may perhaps conſider us as going here too far into the ſubject of fencing, but we requeſt of ſuch to conſider how important the ſubject is to a canal-company, which may have to raiſe much more than a hundred miles in length of quick-fences, as was the caſe a few years ago with the *Grand Junction* canal company, and ſome others, ſome of whom are ſtill feeling the very heavy burden of weeding their quicks two, three, or four times annually; which an adoption of the above principles would, we are certain, have tended to reduce moſt materially. See our articles INCLOSING, FENCING, &c.

The quick for a canal ought to be placed a little above the level of the towing-path, and be ſeparated therefrom by a ſmall ditch, to prevent the towing-horſes from biting or trampling on the quick; but the principal ditch, where the ſudden falling away of the off-bank does not anſwer the ſame purpoſe, ought invariably to be on the field ſide, for keeping the farmers' cattle at a proper diſtance from the quick, and to check their attempts at jumping through or over it. The quick ought not to be placed too near the towing-path, and the hedges ſhould be carefully cut and plaſhed about every twelfth year, both to preſerve them vigorous and in good growth, and alſo to preſerve the towing path clear. On the *Oxford* canal, near Braunſton, we remember that the hedges were ſo grown over the towing-path, in the year 1799, that it was quite dangerous riding along, and the horſes were driven ſo near the edge of the canal, by the intruſion of the buſhes on the path, that the bank was ſuffering materially. In places where the canal is embanked, it will be proper to place the hedge at the bottom of the ſlope, in order to enable the company the better to prevent the growth of rank and large weeds, and the conſequent harbouring of vermin, which would lodge in the bank: ſteep embankments might alſo be materially damaged by the treading of cattle on their ſides. Through common fields, or very large paſtures, it is ſometimes not neceſſary to fence off the towing-path therefrom, but at the boundaries or entry to ſuch fields, a gate is placed in the towing-path, to prevent the intermixture or eſcape of the cattle; and generally theſe gates are double, falling rather forcibly towards each other, by which conſtruction the cattle are prevented from puſhing, or the wind from blowing open the gates, as would otherwiſe often happen.

At the termination of every principal eſtate or farm that adjoins the towing-path, it is uſual to place a ſwing gate acroſs the ſame, to prevent cattle getting away, in caſe they ſhould break, or by accident get into the towing-path. Cylinders ſhould be placed, as before deſcribed, againſt each of theſe gates for the towing-line to run upon; and ſide rails ſhould be placed inclining up to the top of the poſts, to aſſiſt the rope in getting over the ſame.

*Draining* is another expenſive buſineſs, of which a canal company will have a good deal to perform, in moſt caſes. Soon after a canal is filled with water, and often ſooner on the upper ſide, owing to the courſe of the land-ſprings, and thoſe of a more permanent character being intercepted by the puddle-ditches, wet places will appear on the land, which would, if neglected, become unfit for cultivation; theſe are often of conſiderable extent below the canal; and the committee of the canal company muſt not be ſurprized at hearing the farmers attribute many wet places in ſuch ſituations, to the ſoakage of their canal, that really are not affected thereby. It would be of uſe, and the ſource of much ſatisfaction, if the reſident engineer were to note down in his book all the wet and ſpringy places that appeared on the ſloping land, below the level of the canal for a conſiderable diſtance, and the condition or run of water from each before the canal was made; becauſe the appearance of new queaches, as the farmers in many parts call them, or the increaſe or enlargement of others, is often the firſt and only indication of an increaſing and hurtful leak from the canal. The committee ſhould not be nice in drawing the line, as to the extent of draining which they order to be done; but it would, on the contrary, be highly to the credit of their concern, and the intereſt of future canal ſchemes, to bear the whole or a portion of the expence of effectually draining all the land, whoſe wetneſs could, even in miſtaken prejudice, be aſcribed to their canal. The execution of theſe operations ought not to be confined to the quackery of boring a hole here and there in a trench, without any theory or meaning; but the reſident engineer, or ſome profeſſional man employed expreſsly for the purpoſe, ſhould, by a judicious application of his experience and knowledge of the *ſtrata* in every place, apply that particular method of draining, as to the ſituation and depth of the drains, &c. which every ſpot may require. And theſe operations are more various and important than what any perſon, who has not made the ſubject his particular ſtudy, can poſſibly be aware of. See our article Draining. There is a danger attending drains made near a canal, from rats or moles working their way unobſerved beneath the ſurface, between the drain and the canal; for detecting which, or other leaks, it will be proper for the reſident engineer to enter in his book a minute deſcription of the ſituation of the mouth or vent of every drain, chooſing ſituations for the ſame, when they are made, in ditches, where they can be readily got at, and not be liable to be damaged by time, or the treading of cattle. The length and direction of every branch of under-drain which vents at that mouth, ſhould be noted down, and the quantity of water which the drain diſcharges ſhould alſo be carefully eſtimated, at ſome ſhort diſtance of time after the ſame is finiſhed; and a regular and periodical inſpection of theſe drain-mouths by the engineer with his book in his hand ſhould be made, by which any ſecret leak could hardly fail of being detected. It is almoſt unneceſſary to point out the importance of an attention to theſe circumſtances, in ſituations where water is very ſcarce.

The *conſtruction of Boats* for canals and rivers requires ſome notice in this place. Mr. *Chapman*, who has given ſome excellent directions reſpecting the form of boats leaſt liable to overſet or be injured by heeling, has very properly obſerved (*Obſervations*, p. 102.), that the area of a croſs ſection, of a boat to be uſed on a canal, ought not to approach ſo near to the area of a croſs ſection of the water in the canal as 1 to 3, or conſiderable inconvenience will ariſe, both from the increaſed reſiſtance of the boat, and the damage to the banks, from the counter current to fill up the ſpace the boat leaves in her rear. This circumſtance requires particular attention, particularly in boats that are to move quick, like the paſſage-boats from Mancheſter and Paddington, on *Bridgewater*'s and the *Grand Junction* canals: in the former of theſe, we obſerved a conſtant elevation of the water before the paſſage boat, as it moved along, of at leaſt 9 inches, and perhaps more than a foot at times; and the rapidity with which the water ran backwards, between the boat and the ſides of the canal, appeared to have a moſt deſtructive effect upon the latter, particularly on the towing-path ſide; and often this was laid quite under water, for conſiderable diſtances together, by the ſurge or wave oppoſite to the head of the boat as it paſſed along: while the labour of towing was moſt materially increaſed. We regret that we had not the means of aſcertaining, how much the head of the boat was elevated upon this artificial wave in the general, and up which inclination the towing mules were conſtantly drawing it. Some attention ought to be paid to the form of the head and forepart of the boat, with a view to its letting the water paſs freely off by its ſide: flat headed boats, and thoſe whoſe ends are rectangular in particular, ought not to be towed faſt, or great loſs of labour and damage to the banks will be the conſequence, unleſs the canal is very wide and deep. It has been propoſed to form boats ſharp at one end and flat at the other, ſo that the flat ends being joined, two of them may form a body, diminiſhing properly at each end, for eaſy paſſage through the water, and for ſteerage. Mr. *Nicholas King*, an American, has propoſed boats in four parts, that can be detached when the ſame are to paſs an inclined plane, and be afterwards rejoined. Since the uſe of caſt-iron has become ſo general, Mr. *John Wilkinſon* has conſtructed boats and barges of iron, ſome of which are uſed on the *Severn* river, and others upon the different canals in Staffordſhire, Worceſterſhire, &c. Mr. *Robert Fulton*, in his *Treatiſe*, p. 31, has propoſed and deſcribed a kind of rectangular boxes, with low wheels (or rather trucks, as the axle and them are to be caſt in one piece) fixed under their bottoms, to be uſed upon canals inſtead of boats, on account of the uſe which he propoſes to make of them, upon inclined planes and rail-ways, as well as on the water, as we have before mentioned. Mr. *William Chapman*, who has examined this ſyſtem particularly, in his *Obſervations*, has propoſed and given drawings of wheeled-boats of a different conſtruction, larger wheels let into the bottom of the boat being uſed; and his boats are ſo contrived, that ſeveral of them, linked together by their ends, can be uſed together either upon a canal, or a rail-way, or plane. The ſame author has recommended and deſcribed a kind of flat-bottomed boat, with a ſingle or double rail-way on its floor, which he propoſes to receive or diſcharge a loading of rail-way waggons, as it lies in a ſhallow dock, from which the water has been drawn, and to which it is to be again admitted when the boat is to float out into the canal. For eaſe in getting loaded waggons in and out of theſe boats, a pair of leaves, or water-tight flaps, are contrived to let down, and permit the junction of the fixed rail-way on the land and the part thereof that is on the floor of the boat. A curious method of ſteering boats is in uſe on the Bedford, *Ouſe*, the *Cam*, and others of our eaſtern rivers: two boats are always uſed together, one of them having a ſtrong pole, or bowſprit, projecting horizontally from above its prow; this is brought over the ſtern of the boat which is to go before it, and the prow or ſtem of one boat is faſtened by a rope cloſe to the ſtern-poſt of the other: to the firſt boat the towing-line is fixed, and the bowſprit of the laſt boat is uſed as a tiller to ſet or retain the laſt boat to any required angle with the firſt, by which the laſt boat acts very effectually as a rudder for ſteering the firſt. Mr. *Chapman* propoſes to adopt this principle with ſmall boats upon canals. The weſt-country bargemen, on the Thames, guide or ſtop their boats, as they are floating down the ſtream by a long and ſtrong pole, with iron prongs at bottom and a croſs handle at top, round which they dexterouſly wrap a ſhort rope, faſtened to the ſide of the barge, when the pole has ſtruck into the bottom of the river.

For ſpeedily emptying the cargoes of ſmall boats into larger veſſels, Mr. *Davis Dukart* contrived, on the navigation to the Dungannon Collieries, to float his ſmall boats on to cradles or wheeled carriages, on which they were dragged up a ſhort inclined plane, and upon a rail-way conducted over the barges in the baſon; and then the boats could be turned over, and their contents ſhot at once into the barge. A different method, as Mr. *Chapman* informs us, is practiſed in South Wales: it conſiſts in continuing the canal (which may be a wooden trough) to the place of diſcharge, and terminating it on a caiſſon, ſuſpended on a tranſverſe centre; the boat being arrived at its place, the end of the canal is cloſed by a ſtop-gate, and the ſmall quantity of water contained in the caiſſon (which the boat ſhould as nearly as may be fill) being let out, the caiſſon with the boat in it may be turned over, as already deſcribed.

The *moving of Boats* upon canals or narrow rivers, where ſailing is impracticable, has always appeared attended with conſiderable difficulties. Where the width and depth of water will admit, long oars have been uſed, worked by one or two men on each ſide of the veſſel, as is done on the coal-barges and lighters on the *Thames* in or near London. On the *Tyne* river at Newcaſtle, their keels are ſaid to have been in uſe ever ſince 1378, and are rowed by an immenſe oar *on one ſide*, another being uſed at the ſtern to ſteer by, and counteract the tendency of this ſtrange mode of rowing. It is ſaid that the large oar is hung by an iron ring, ſo as to admit of its being laid on the gunwale of the keel, when not in uſe, but not of its being removed. Owing to the want of any regular and proper path on which horſes could travel by the ſides of rivers, the firſt hauling or towing of boats was performed by men, as ſtill continues to be the caſe on the canals of China; and in this country moſt of our navigable rivers were without horſe towing-paths till of late years. Within our recollection, ten or fifteen men were ſeen tugging at the hauling-line of a barge on the *Thames*, in the meadows of Twickenham. A good horſe-path now begins at Putney bridge, on the ſouth ſide, and continues uninterruptedly on one ſide or other of the river to the extreme points of the navigation. Theſe eſſential appendages to navigation are but now completing on the *Severn* river, which has been ſo long famous for its navigation. The towing-path on many of our old navigations is continually interrupted and broken off, by mills and other obſtacles, without any bridges for the croſſing of the towing-horſes and boys. On the *Ouſe* river, below Bedford, we have obſerved the towing-path to be interrupted at the end of almoſt every field, by high and dangerous ſtiles, over which the ill-fated navigation-horſes have to leap, encumbered by their harneſs and the heavy rope. No regular path is maintained, in a great part of the diſtance, by the owner of the navigation; but frequently the fine meadows there are cut up, by the track of the horſes being at a conſiderable diſtance from the river, acroſs the many bends that it has; and the farmer's graſs, between this path and the river, is rendered of little value, by the ſoiling and dragging of the hauling-rope over it; the banks of the river are alſo miſerably worn away, by hauling ſo far from, and conſequently ſo obliquely to, the direction of the ſtream. In many places, where the river is wide, there is no track for hauling, except along the bed of the river itſelf; where often the horſes, with a wretched boy upon one of them, are ſeen ſometimes wading, and at others ſwimming, along the courſe of the river! Nothing is more common than ſeeing the horſes and boy have to ſwim over from one ſide of the river to the other, when the hauling-way changes; not unfrequently this is impracticable, from the total want of a way on either ſide, and the poor horſes are obliged to leap from the bank, perhaps when at a conſiderable height and diſtance, into the head-room of the barge, to the great peril of their bones and neck: ſhortly after, theſe wretched animals, and probably with a boy on their backs, are forced to jump out again, and perhaps plunge into the deep river and ſwim on ſhore, to reſume their labour of towing. A correſpondent of Dr. *Anderſon* has expatiated (*Recreations*, v. 318.) on the barbarous ſight of ſix horſes harneſſed at length, towing a barge up the *Thames* above Putney, by a ſingle line of inſufficient length, by which the hind horſes were in continual danger, in ſpite of their utmoſt exertions, of being precipitated into the river: what would this humane gentleman have ſaid, if his walk had been along the banks of the *Ouſe*, on a piercing winter's day? It is owing, in a great meaſure, to the enormous difficulties and expence of conſtructing and maintaining a proper horſe-path by their ſide, that the navigation of many of our rivers is ſo imperfect. In all flat countries, except the river is embanked, as in Cambridgeſhire, Lincolnſhire, &c. and without any wide waſh or fore-ground within the banks, the towing-path often cannot be made up above the reach of the floods, but, during every floody ſeaſon, will be under water and uſeleſs; and perhaps, when the water ſubſides, it will be found carried away by the force of the current for great lengths together. On ſome of our canals, the practice at firſt prevailed of towing by men; and the ſame ſtill continues on the *Stroudwater* canal, whoſe towing-path has *ſtiles* upon it, like thoſe of a foot-path, at the diviſions of different perſons' lands. Horſes are now, in general, uſed for towing boats on our canals, except the late duke of *Bridgewater*'s, who reared a large and fine herd of mules, that were found to anſwer ſo well, that none others are uſed to this day, we believe, on that canal. Except with paſſage-boats, and flies or packet-boats, for the expeditious conveyance of packages and parcels, the uſual rate of tracking or towing upon our canals is about 2½ miles per hour, including the time loſt in paſſing the locks, which, if of 8 feet riſe, will require about 5½ minutes each.

It is certain that there is hardly any limit to the load, which one horſe can move, in a number of barges attached together, when going with a proportionally ſlow pace; and this has occaſioned ſome canal advocates to aſſert that one horſe will, on a canal, draw as much as 60 on the road; while Mr. *Robert Marſhall* has aſſerted, that horſes will not be able to move more than 15 miles per day with deep laden barges on a level canal. On moſt of the wide canals it is uſual to employ a horſe to each barge, or to a pair of boats of half the width each that the barges are. It appears, that on the *Ketley* canal, on *Bridgewater*'s canal between Worſley and Mancheſter, and others, ſeveral of the ſmall boats in uſe thereon are linked together, and drawn by one horſe or mule; there being projecting and ſmooth rails provided on the *Ketley*, at all the convex points of the bank, to keep the boats in their proper track. Mr. *Fulton* has imagined, that 15 or 20 of his ſmall rectangular boats, linked together, could be drawn by one horſe, and be kept in their proper line upon the canal by a man with a boot-hook walking by the ſide of them on the towing-path. Beſides the methods of rowing and tracking, which we have been mentioning, on the *Tyne*, the *Thames*, and moſt of our rivers, hitchers, ſets, puys or poles, are uſed for ſhoving of barges along: the gunwale of the keels or barges is made wide and convenient to walk upon, and the boatman, being at the head of the barge, ſets his hitcher againſt the bottom and ſhoves againſt it, walking along the gunwale of the barge until he has arrived at the ſtern; when he draws up his hitcher quickly, and returns to the head to repeat the ſame operation, and this ſometimes on one ſide of the barge and ſometimes on the other, unleſs there are two men ſo employed, whoſe equal action could keep the barge in its direct courſe. This laſt method might be more uſed than it is upon canals; but from the neceſſity which moſt of them have found, for prohibitory clauſes in their act, againſt the uſe of any pointed poles, particularly ſuch as are ſhod or tipped with iron, on account of the damage which ſuch often do, by penetrating and diſturbing the lining and banks of the canal, and cauſing it to leak. We have heard of an attempt lately, to introduce a kind of hitcher-iron on the *Grand Junction* Canal, which ſhould preſent a flat end or ſurface, ſufficient to prevent its penetrating the facing on the bottom or ſides of the canal, and having a ſmall turn up at the point, which might remedy the loud complaints of the boatmen, at being debarred a hooked pole on board their boat, by which a comrade, who has the misfortune to fall overboard or into a lock, might be dragged up to the ſurface of the water. We have thought that it might be worth while, particularly in crooked and difficult parts of a canal for hauling, and where rubble ſtone or gravel is in plenty, when a wide canal is cutting, to form the covering of the lining, or the facing of the bottom, and perhaps of the lower part of the ſides alſo, of gravel or rubble inſtead of earth, and carefully to level and ram or roll the ſame down like a road, ſo that hitchers might be uſed freely thereon as on the bottom of a river. There would ſtill, however, require very ſtrict and well enforced regulations, to prevent the walls of the bridges, locks, tunnels, &c. from being pecked and greatly damaged by the points of the hitchers. Slide-rails will alſo be neceſſary, in and near the locks or tunnels, as we have mentioned in ſpeaking of the Bliſworth tunnel, which can, without damage to the walls, be removed, when decayed or worn out. Before we proceed to the ſubject, that has perhaps produced the greateſt number of unpractiſed mechanical inventions that are any where elſe to be found, we mean for *moving boats* by an impulſe from within or accompanying them, we have one other thing to mention, viz. that Mr. *James Jordan*, in his patent of the 24th of May 1796, for bridges, before quoted, has propoſed the uſe of circulating chains acroſs an aqueduct bridge, for towing boats over the ſame; and avoiding the expence of the extra width for, or lateral ſupport of, a towing-path thereon.

The volumes of the *machines approved by the Academy at Paris*, and the *cabinet* of *M. de Servier*, printed in 1719, contain plates and deſcriptions of many different contrivances, deſigned for *propelling or rowing of boats* on canals and rivers; one kind of theſe, which we ſhall firſt notice, depends upon gaining an impulſe or hold agaiſt the ground at the bottom of the river or canal; in one of which, a ſmall boat moved by oars was propoſed to be employed in ſucceſſively carrying forwards and dropping anchors whoſe ropes were to be attached to a horſe-gin on board of a barge, which was deſigned to tow or drag a great number of others. In another, a ſpiked wheel was propoſed to roll on the bottom of the canal, attached by a frame moveable on hinges at the ſtern of a barge, where a roller turned by a winch, was to give motion to the ſpiked wheel and propel the barge, by means of an endleſs rope or chain. See alſo *Walker's Lectures*, 4to. page 350. A ſecond kind depended upon the ſame principles as an oar, except in the conſtruction and mode of applying the power. On the 20th of July 1796, Mr. *Thomas Potts* took out a patent, for the uſe of a large flap or oar, moving on an horizontal hinge, upon a framed lever at the ſtern of a barge, intended when the handle of this lever was lifted up by ſeveral men, to turn on its hinge and preſent but little reſiſtance; but on the deſcent of the lever, its whole ſurface was by the action of the men at the lever, to be exerted on the water for propelling the barge: ſee *Repertory*, vol. vi. p. 160. In the year 1801, Mr. *Edward Steers* took out a patent, of which we have ſeen only a ſhort extract in the *Monthly Magazine*, vol. ix. p. 486, from which we underſtand his invention to differ but little from the above, except in having two paddles or oars. Mr. *Robert Beatſon* took out a patent, for applying the principle of luffer-boards or venetian-blinds to ſeveral purpoſes, which he has explained at length in his *Eſſay* printed in 1798; and at page 60, propoſes to propel ſhips by large oars or fins of this kind to be hung on the ſides thereof by hinges, and worked by a lever, as a rudder is by its tiller; poles with ſquare frames fixed on their ends, to puſh againſt the water behind the veſſel are alſo deſcribed. A third kind, depending on the reverſe of the action of an underſhot water-wheel, has had many advocates; the firſt that we have met with in our own country, is Mr. *Thomas Savery* in 1698, whoſe contrivances are ſhewn in *Harris's Lexicon Technicum*, art. Engine; it conſiſted of 6 or 8 paddles like thoſe of a water-wheel on each ſide of the veſſel, fixed on an axis acroſs the ſame, on which was a trundle head, and under this a wheel working into the ſame, by the force of a capſtan to be turned by men. We are told, that in the year 1781, the *abbé Arnal* propoſed to apply the power of a ſteam-engine on board of a veſſel, for working paddles, ſomething like the above, we believe. Soon after this period, we remember ſeeing on the ſhore of the *Thames* at Weſtminſter, a ſmall barge with a water-wheel in a cavity in its ſtern with a ſteam-engine for working it, which was ſaid to be the contrivance of *earl Stanhope*, and had been tried with ſucceſs againſt the tide in the river. In the year 1797, a veſſel having rowers by its ſide, that made 18 ſtrokes per minute, from the action of a ſteam engine on board, was tried on the *Sankey* canal near Liverpool, by which it was propelled 10 miles and back again to the ſame place: ſee *Monthly Magazine*, vol. iv. p. 75. In the ſame year, Mr. *Walker* (the lecturer) made ſome experiments on the *Thames* at Reading, and cauſed a boat to row itſelf againſt the ſtream. See his *Lectures*, 4to. page 349. About the year 1800, *Meſſrs. Hunter* and *Dickinſon* took out a patent, for a propeller for ſhips, which was tried in January 1801, on board of a government ſloop off Deptford on the *Thames*, and the ſloop thereby made way againſt the tide at the rate of three knots an hour. *Monthly Magazine* vol. xi. p. 195. In the *Journals of the Royal Inſtitution*, about the year 1802, there is a deſcription of an improved application of the ſteam-engine, to the turning of a wheel for propelling boats; the cylinder of this engine is horizontal, and the wheel with paddles is in a cavity in the ſtern of the boat, which therefore has two rudders, one on each ſide of the wheel, connected together by croſs rods. A veſſel of this kind was conſtructed for the *Forth and Clyde* canal company, under the direction of Mr. *Symington* the inventor, and in a trial made in December 1801, it drew three veſſels of 60 or 70 tons burthen each, at the rate of $2\frac{1}{2}$ miles per hour on their canal: ſee *Agricultural Magazine*, vol. vii. p. 152. We read in the laſt mentioned work, vol. ix. p. 218, that Mr. *Robert Fulton* exhibited a veſſel on the *Seine* at Paris, in Auguſt 1803, having two wheels with paddles, worked by a ſteam-engine, and that two other veſſels were towed by it againſt the ſtream at the rate of 3 miles per hour. A fourth kind of boat propellers, has depended on the rotary motion of a ſcrew, or fliers like thoſe of a ſmoak-jack; Mr. *Daniel Buſhnel*, in his attempts to navigate ſub-marine veſſels, as related in the *Tranſactions of the American Philoſophical Society*, vol. iv. p. 303, uſed oars, placed near the ſides and top of the veſſel, formed upon the principle of a ſcrew, the axles of which entered the veſſel, and by turning the ſame one way, the veſſel was made to advance or deſcend, as it was to recede or aſcend by a contrary motion of the ſcrew. Mr. *John Vidler* has contrived a veſſel, which has been lying, and occaſionally tried in the *Thames* at Weſtminſter, for 2 or 3 years paſt, that has a boom hung by an univerſal joint (Hook's) at the ſtern thereof, to a rotative axis, turned by a capſtan upon the deck of the veſſel; at the end of this boom is fixed a circle of ſtrong flyers, juſt like thoſe of a ſmoak-jack, which by ſtriking the water obliquely as the boom is turned round, propel the veſſel forwards; near to the flyers there is a collar on the boom that turns eaſily therein; to this collar ropes are attached, which go to different parts of the ſtern of the veſſel, and by which the boom, when in motion, can be drawn up quite out of the water, if its propelling action is wanted to ceaſe on any temporary occaſion, or the flies thereof can be let down into the water to any depth which may be required, or be turned aſide from the direct line of the veſſel to ſteer her on any courſe, without waſting ſo much of the propelling power upon the rudder as is uſually done in ſteering; a rudder is however applied to the veſſel ready for uſe when occaſion may require. The fifth and laſt method, which we recollect to have ſeen or read of, conſiſts in pumping water, by a force-pump through an orifice or pipe at the ſtern, or end of the keel of the veſſel, with ſuch force as to propel the veſſel along, by the ſtroke of the moving column of water againſt the water, in which the veſſel floats; we are ſorry that our memory does not ſerve us to mention the name of the inventor of this method, or the work wherein we ſaw a deſcription of the apparatus. In the *Britiſh Magazine*, vol. i. p. 397, it is mentioned, that in the year 1800, a veſſel was conſtructed at Liverpool with a ſteam-engine in it, which was moved along without the intervention of any machinery; we think this as likely to have been, an application of the pumping principle above mentioned. Although, as we hinted above, none of the mechanic contrivances here mentioned have been adopted in practice, we truſt our readers will not be diſpleaſed, at the ſhort notice which we have given of each, with a view to preſerve their memory, and in hopes that the thing may yet be accompliſhed.

On the *repairing of Canals* we think it neceſſary to ſay ſomething; and to begin, by recommending the adoption of a ſyſtem of management, by which the eaſieſt notice of any defect, or want of reparation, will be obtained: that in ſtore-houſes, at proper places on the line, a ſtock of oak, elm, and deal timber ſhould conſtantly be kept, cut out and ſeaſoned, ready for replacing any of the timbers or planks in the locks or other works, with the leaſt poſſible delay to the trade; a circumſtance which, if not attended to, may prove of incalculable injury to the credit and ſucceſs of the concern. Sound and good bricks, and ſtones, ready for replacing any which are liable, or obſerved to be likely to want repair, ſhould alſo be in readineſs, and good cement ſhould always be kept in readineſs, on ſome part of the line from whence the quantity wanted may be ſpeedily tranſported to any part where a reparation of the walls, bridges, culverts, &c. may require the ſame: however, before emptying any part of the canal, or interrupting the trade for any reparation, a ſtrict ſearch ſhould be made throughout every part in that level, or on the adjoining ones, to diſcover all the defects therein, that arrangements may be made beforehand for repairing the whole at once, or with as little delay as poſſible, while the trade is interrupted on the line. In every ſtore-houſe a conſiderable number of the *pile-planks* before deſcribed ſhould be kept piled up in readineſs, for making temporary ſtanks or dams, in order to empty any particular part of a level, which may have a culvert, trunk, ſluice, ſtop-gate, lock-ſil, or other thing which is damaged, out of order, or decayed. It is ſurpriſing, to thoſe who have not ſeen ſuch works performed before, with what facility the workmen who are uſed to this buſineſs will drive two rows of pile-planks ſo regular and cloſe to each other, that by the help of the tongues or ſlips in their grooves, and often without, a tight ſtank is made without any earth or other looſe matters to ſtop the water; and between two of theſe ſtanks, if ſuch are neceſſary, they will empty the water, by chain-pumps, or water-ſcrews, to get at any culvert, or other matter, to be repaired or altered; there have been inſtances of theſe operations being performed, and of the part being filled with water, and the plank-piles drawn up again for the trade to paſs, in the ſpace of eight or nine hours. Should any part of the canal appear to want new lining or puddling, owing to a neglect at the time of making of the canal, or to any ſubſequent accident, care ſhould be taken to chooſe the time for ſuch works, when the trade can beſt bear an interruption; and as, on the average of ſeaſons, the trade is two or three weeks interrupted by ice, during the months of January and February, it may not be amiſs to embrace that period, on ſome occaſions, although the work may be longer about, and ſome additional expence may be incurred by covering up the work with earth, before it is left at night, to prevent its freezing, and in removing all ſuch puddle, &c. again in the morning, or at beginning work, which ſhall be found frozen. Previous and explicit notices ſhould be given of all intended interruptions to the trade, as long beforehand as is neceſſary, to enable the traders to ſupply ſtocks of articles at the places of conſumption on the line, and to avoid having their barges locked in, and perhaps lying idle, when they might have been employed if they had been on a different part of the canal.

It is an eſſential point of good management to have experienced mole and rat-catchers employed from time to time upon the line of a canal, to extirpate theſe hurtful vermin; and in every inſtance of diſcovering one, to trace out all his burrows and holes, and have them carefully ſtopped up and filled in every part, as well for preventing the harbouring of other animals of the ſame ſort, as for preventing the water from making its way into and through them. On a canal in Surry, we are told by Mr. *Robert Marſhall*, in his *examination of a canal and rail-way*, &c. that a *mole* or *rat-hole* only, occaſioned, after the hard froſt of 1795, the rupture of the canal in a high embankment, by which more than 100 yards in length of a lofty bank was precipitated into the meadows and river below, and that a barge which before lay enveloped in the ice on the canal, was hurried down through this gulph into the river! It is impoſſible to take too much care againſt ſuch fatal diſaſters as theſe, and the duty of the mole and rat-catchers ought not to be limited to the company's ground, but in all fields, banks, ponds, or brooks within 100 yards or more of the canal, on each ſide, they ought to be equally attentive to the deſtruction of ſuch vermin, and the demoliſhing of their ſecret retreats. The ſame men might very properly be employed in pulling up and extirpating all large and ſpreading weeds from every part of the banks of the canal, and in mowing down the herbage occaſionally; theſe circumſtances being not leſs eſſential for the neatneſs and beauty of the canal, than to prevent the firſt harbour of vermin of different kinds. The banks of the canal will be very apt to continual wear at the ſurface of the water, and for ſome height above and below that level, if a proper kind of herbage is not encouraged upon the ſlope of the bank: conſiderable care ſhould be taken to ſuffer no plants to take root on or near a canal bank, or ſpread its ſeed, (if poſſible to prevent it where water is taken into the canal by a feeder), which will grow in deep water, or whoſe roots are large, hollow, and ſtrike deep into the ground, leſt the former of theſe ſhould choke the canal in time by weed-beds, and the latter render it leaky by the formation of numerous open tubes through the lining into porous ſtuff. None but thoſe who have ſeen many drains or new ditches opened in wet and boggy ground, can be aware of the depth, ſize, and number of hollow roots, which ſome of the aquatic plants, as the *equiſetum paluſtre*, or marſh horſe-tail, the *iris pſeudacorus*, or yellow flag, and ſeveral others, ſend forth into the ground.

Puddle-ditches, in the banks that are raiſed or made up, are a great ſecurity againſt the bank being waſhed down, in caſe of the water, riſen by any ſudden thunder-ſhower, or other inordinate rain, breaking over the top of it; as ſoon as the puddle is reached, the effect of the ſtream to tear and lower the bank will often be ſtopped; for good puddle, when properly ſet and hardened in the centre of a bank, is ſo compact as not to be liable to be abraded or ſuddenly worn by a current of water. In caſe of the breaking or ſlipping of a bank, ſo that a conſiderable and wide breach is formed, and ſtill increaſing, it is a good practice to drive in two rows of common fold hurdles, at a foot or leſs apart, laſhing the ſame well together by cords, and ſecuring them by ſtrong ſtakes drove down behind them, and if the ſtream of water be deep through the breach, it will be neceſſary to drive other long ſtakes obliquely into the ground, and ſecuring their tops to the hurdles and upright ſtakes by laps of cord, that theſe laſt may act as ſtruts to prevent the whole being borne away; into the cavity between the hurdles; ſtraw or ſtubble ſhould then be put and trod down, beginning at each end and working towards the middle, in order to prevent the current being turned, with freſh impetuoſity, againſt the ſides of the breach; ſuch a dam as this will prevent the loſs of any conſiderable further quantity of water, and will render the water ſtagnant, ſo that a row or more of pile-planks can be drove to cut off the connection with the breach, which can then be emptied of water, the hurdles and ſtraw removed, and the reparation begun, with proper puddle-ditches for its ſecurity, as before deſcribed. At the famous Dagenham breach of the embankment of the *Thames*, dove-tail, or plank-piles were uſed, we are told. It will be neceſſary to defend many places of the banks of a canal that are obliged to be unuſually ſteep, as in the approach to a bridge or lock, a wharf, &c. with a facing of planks, called *camp-ſheeting*; this conſiſts of ſtrong piles driven into the bottom of the canal, with the proper inclination, with horizontal pieces, or land-ties to their tops, on to which piles ſound and durable planks are ſpiked. In ſome places, owing to the accidental or unavoidable admiſſion of very thick water into a canal, or in more caſes by the ordinary depoſit in length of time, the canal will become choked with mud. In theſe caſes a machine with buckets, like a chain pump, to ſcrape the bottom of the canal, and afterwards diſcharge the load of mud into a barge, might be uſed, ſuch a machine, worked by horſes, being now in uſe in the *Weſt India Docks*. See alſo *Walker's Lectures*, 4to. p. 35. The late Mr. *Brindley*, we are told, contrived a plan for the purpoſe of clearing the docks at Liverpool from mud.

By neglect it will ſometimes happen in canals, that *Weeds* grow up from the bottom, and form an unſufferable impediment to the motion of the barges; and this is almoſt unavoidably and generally the caſe in river navigations, if conſtant care is not uſed to tear them up, or cut them down. On the great *Ouſe*, and other fen rivers, a machine has been long in uſe, called a *bear*, for tearing up ſtrong weeds by the roots.

About the year 1796, the *chevalier Bentancourt Molina* preſented to the *Society of Arts*, a model of a barge, having a windlaſs in its ſtern, which gives a circular motion to a pair of knives or ſcythes, or a lever giving an alternating motion to knives for mowing off weeds cloſe to the bottom of a canal, in which the barge is to float, or on the ſloping ſides of the canal; for which purpoſe, the knives can be made to revolve at any depth below the ſurface of the water, and either horizontally, or inclined in any angle; this model may be ſeen at the ſociety's houſe in the Adelphi, and a deſcription and view of it will be found in their *Tranſactions*, vol. xiv. p. 345. or *Repertory*, VI. 169. In moſt winters it happens, that an ice not more than an inch or an inch and half thick, continues for a conſiderable length of time on canals, and other ſtagnant waters; this, or even a leſs thickneſs of ice is ſufficient to ſtop the trade upon canals, unleſs the ice is broken; and, for this purpoſe, it is adviſable, every morning of a froſt, unleſs the ice ſhould be found more than uſually thick, and the froſt increaſing, and likely to continue, to break the ice on each pound; this is uſually and effectually done by a ſtrong and ſquare headed barge, whoſe ſloping or projecting head is covered with ſtrong iron plates. One of theſe barges being drawn along the canal, and into each lock, by ſeveral horſes, has a conſtant tendency to riſe up upon the ice, and thereby breaks it down before the barge: about the lock-gates it will be neceſſary to break the ice by ſtamping with the end of a pole. Mr. *Symington*, whoſe barge, with a ſteam engine in it, to propel it along, and tow other veſſels, we have lately mentioned, has provided the head of his barge with ſtampers, to be worked by the engine, for breaking of the ice before it, in froſty weather.

Leaks in a canal may ſometimes be ſtopped without emptying the water, if the depth will permit it, by preparing good puddle in a flat-bottomed dirt-boat or flat, and dropping the ſame in ſpadefulls equally over the ſurface, and when a certain length is done, raking the ſame about with a rake, with ſhort teeth to join the pieces together, and level the bottom. The difference in ſpecific gravity, in different loams and earths, is ſo conſiderable as to make ſome of them much more proper for the lining and facing of a canal than others; the heavieſt that can be found ſhould be uſed when leaks are to be ſtopped, and the water remain in the canal as above. We have paſſed along the branch of a canal on a chalk ſoil, where the lining of the bottom was ſo light, that the motion of the barge ſtirred enough of it up into the water, which was before nearly clear, to make it almoſt as white as milk behind us; this light ſtuff has ſince been taken out, and a ſubſtantial lining and facing of proper ſtuff, brought in barges for the purpoſe, and laid on the bank before the water was let out, has been applied, by an able engineer, who ſucceeded thoſe of too different a deſcription who conſtructed this very leaky branch.

Some *Implements* and machines are uſed in the making or working of inland navigations, which we have not had occaſion yet to mention or deſcribe. In every conſiderable work it will be neceſſary to erect rolling-ſtones for grinding and preparing of the cement or mortar that is to be uſed in the water-works. At Worſley, on *Bridgewater*'s canal, the power of a water-mill is applied to turning ſeveral pair of large ſtones on edge, like thoſe uſed by tanners, gunpowder-makers, &c.; in ſome of theſe the ſtones rolled round on a fixed ſtone, in others a large caſt-iron flat pan, in which the materials to be ground were put, was turned round under the ſtones, which were thus made to revolve round their own fixed axis on the materials. What appeared ſingular in the proceſs at this place was, that the lime and other ingredients were ground with water for a long time, in the ſtate of thin mortar, which was then removed into ciſterns to dry, and before the ſame was become too hard, it was cut out by a ſpade, into lumps of about half a cubic foot each, and heaps of them were preſerved in a ſtore-room, where they became quite dry, and as hard as chalk, or harder, for uſe at diſtant periods of time, in the repairs of the walls and works under water. At the *London* and *Eaſt India* docks ſteam-engines, of twenty horſe power in one caſe, were uſed for grinding their cement; but the pozzolana, lime, and other ingredients are here mixed and ground together in due proportion in a dry ſtate (as *Parker* and Co.'s patent Roman cement is done), and it is not wetted, but carefully preſerved from moiſture, till a very ſhort time before it is to be uſed in the walls, &c. See the article Rolling-stone.

The *driving of Piles* is a very conſiderable buſineſs in many large concerns; at the entrance of the *London Docks* a ſteam-engine was erected for driving the vaſt number of piles which were required for the coffer-dam. Mr. *S. Bunce* contrived a very ſimple and effective kind of pile-driver, to be worked by men at a winch. Mr. *Harvey* contrived a double pile-driver, which is deſcribed in the *Tranſactions of the Society of Arts*, vol. xii. p. 337. The horſe pile-driver contrived by M. *Vauloue* cannot, from the almoſt innumerable models, plates, and deſcriptions which have appeared of it, ſince the building of Weſtminſter Bridge, be unknown to any of our readers. Mr. *John Fould* contrived a machine, and preſented a model of it to the *Society of Arts*, (ſee their *Tranſactions*, vol. xiii. p. 280) for cutting off the tops of piles, after they have been drove, beneath the ſurface of the water. See the article Pile.

Some of the navigator's tools and implements, as barrows, horſing-blocks, grafting-tools, ſhovels, and ſcoops, we have repreſented in *figs.* 48 to 52, *Canals, Plate* VII.

*Cranes* for the hoiſting of goods will be required on the wharfs of canals and rivers. See our article Crane.

On the *general management*, and office department, of a canal concern, it is unneceſſary to enlarge. The committee with which the conduct of it is entruſted will, without doubt, direct their attention to thoſe various circumſtances on which its proſperity depends. Accordingly, they will appoint proper officers in the ſeveral ſubordinate departments, and give them ſuch inſtructions for the regular diſcharge of their duty as occaſion may require. It may not, however, be improper to ſuggeſt, that the canal committees ſhould direct their reſident engineer to eſtabliſh proper rain and evaporation gauges at ſeveral lock-houſes upon the line, to be kept by the lock-keepers, and regiſtered daily or weekly with great care: theſe obſervations, preſerved in the company's books, or, what would be better, publiſhed in ſome of the magazines, would prove of great advantage to ſcience, and to canal undertakings in general. In canals of conſiderable length, particularly if ſome parts of them are indifferently and variably ſupplied with water, or leaky, it will be right to fix gauges or graduated rods on each upper lock-gate, that would ſhew at all times how many inches depth of water there is at the time, in the ſhalloweſt part of that pound; and to cauſe the lock keepers to mention the ſame at the foot of the printed permits or paſs tickets, that the toll-clerks ſhould give to every bargeman who paſſes, containing the number and deſcription of each barge, and the deſcription and weight of its loading; theſe, tranſmitted regularly to the toll-collector, would enable him, or ſome other perſon, to keep for the information of the committee, a regiſter of the daily ſtate of each long or leaky pond of water; at the ſame time that the lock keepers, toll-clerks, &c. at each extremity, and on different points of the canal, would always be acquainted with the ſtate of the water, and the loading which a barge could paſs with at every particular place; and could inform bargemen; for want of which knowledge great delay and expence are often incurred, in dry ſeaſons, by ſetting off with more lading than can be carried through, for want of a ſufficient depth of water, and part of the ſame is obliged to be left on the road, or taken into other boats. All the regulations contained in the act, for working of the canal, and ſuch by-laws as the committee may ſee it neceſſary to make, for regulating the conduct of the bargemen and others on the canal, ſhould be printed, and ſtuck up at every wharf on the canal, and in every toll-clerk and lock-keeper's houſe; and all the company's agents and ſervants ſhould be ſtrictly enjoined to notice every breach of theſe rules and regulations, not by altercation with the offenders, but by immediately noting down in writing the exact and true particulars, of the time, place, and name of the offender and bye-ſtanders or witneſſes, &c. tranſmitting the ſame immediately to the committee, and preſerving a copy thereof themſelves: and, though we are far from recommending [illegible] in puniſhing on theſe occaſions, yet a ſyſtem of this ſort, by ſhewing the offenders that the committee would always be prepared to proceed againſt them, would, in moſt inſtances, eſpecially if the parties were written to, to threaten them, go a great way to prevent the ſame parties or others from offending again.

*Tonnage Tables*, fully and explicitly ſtating the toll or tonnage payable to the company, on goods or articles of every different kind, or on different parts of the line, if, as often happens, theſe vary, ſhould be printed and ſtuck up on all the wharfs and toll-houſes, for preventing all doubts or altercations between the company's ſervants and the traders. At ſome convenient place on the line of the canal, a *weighing-houſe* ſhould be prepared, conſiſting of a dock under cover, large and deep enough to contain the largeſt veſſels which are to navigate the canal; this dock ſhould be furniſhed with a draw-gate to let down, or doors to ſhut, when an empty barge has entered, in order to render the water quite ſtill within the dock. Caſt-iron or leaden weights of 2 cwt. each ſhould be provided, and a crane to hoiſt the weights readily in or out of the barge, and place them in any part of the ſame, ſo as always to load her evenly. To this weighing-houſe, the act or by-laws ſhould require every barge to be ſent, having the name thereof, and the owner's name and reſidence previouſly painted on the ſtern of it, before it is allowed to trade on the canal: the empty barge being arrived in the dock, the gauging-maſter fixes four ſmall plates of iron, each containing the *number* that this barge is in future to be diſtinguiſhed by, two on one ſide, and two on the other, againſt the gunwale, near the head and ſtern. Theſe plates are all fixed at the ſame diſtance from the ſurface of the water, when the barge is empty; this diſtance, in inches and tenths, is entered into the gauging-maſter's book, under the number of the barge, name, owner's name and reſidence, date, and other particulars; two tons of weights are then hoiſted into the barge, and regulated until the diſtance from all the four plates to the water's ſurface is the ſame, which diſtance in inches and tenths is alſo entered in the book againſt two tons; two tons more of weights are then hoiſted in and adjuſted, and the height of the number-plates above the water is taken and entered againſt four tons as before; theſe operations being repeated until the utmoſt lading of the barge is on board, when the weights are taken out again, and the barge removed from the dock. For meaſuring the height of the plates at the Paddington weighing-houſe, a tin tube is uſed, that is furniſhed with a float moving freely in it, to mark the ſurface of the water, which carries a light ſtick graduated to inches and tenths, to ſhow the height of the number-plate againſt which it is applied. At every toll-houſe on the *Grand-junction* canal ſimilar floating-rods are kept, and to every laden barge which paſſes this gauge is applied againſt the number-plate, at each end, and to thoſe on the other ſide, if the barge appears to heel at all to either ſide. If the dry inches and tenths ſhewn by the gauge, between the number-plate and the water's ſurface, are different, they are added together, and divided by the number of them for the mean height. It is the buſineſs of the gauging-maſter to calculate, from the particulars entered in his book, of each barge as above, the weight to the neareſt of $\frac{1}{4}$ of a ton, which anſwers to every inch and tenth of an inch, of the dry inches ſhewn as above by the gauge; the number of the barges are applied in a regular ſeries, in the order in which they come to be gauged; and a book, containing a table for the tonnage on board, anſwering to every dry inch and tenth, as above, is calculated, and a copy of each is in the poſſeſſion of each toll-clerk, by a reference to which, he ſees and enters in his toll-book, and in the paſs-ticket or permit, the number of tons and quarters for which tonnage is to be paid to the company. On a great number of canals the practice is different; the gauging-maſter prepares four ſlips of copper or lead, about $\frac{3}{4}$ of an inch broad, and $\frac{1}{8}$ thick, and ſtamps thereon at every diviſion anſwering to two tons, agreeable to the obſervations entered in his book, and between theſe ſtrokes are drawn to mark the intermediate tons and quarters of a ton. Theſe plates he ſees carefully nailed on to the ſides of the barge, under the number-plate; by help of which the toll-clerk, and the bargeman alſo, can at any time ſee the tonnage on board, by the place on the plates cut by the water's ſurface.

Moſt acts contain a proviſion reſpecting barges occaſionally navigating a canal, or any others where reaſon appears to the toll-clerk to ſuſpect a deception or fraud, for requiring the bargeman to give an accurate account of his lading on board; which if unſatisfactory, the toll-clerk may take ſuch barge to the neareſt wharf where accurate ſcales, ſteel-yards, or engines for weighing goods are kept, and there have the cargo unloaded and weighed; which expence, as well as a penalty, the bargeman is made to pay, if he had refuſed or neglected to give an account of his lading, or if his account ſo given ſhall prove below the real weight of the goods. New barges are uſually indulged, in two or three voyages, before they are gauged, in order the better to ſuit the bargeman's and gauging-maſter's convenience for doing it, during which they are ſubject to have their goods weighed, as they alſo are, whenever they have different goods on board, liable to different rates of tonnage, and do not give a ſatisfactory account of the weight of each.

In many acts there are clauſes inſerted to prohibit the planting of trees in the canal-hedges, or on its banks, as there are alſo in others, for reſtraining the company from erecting any houſes or buildings on the banks of the canal, except certain ſpecified public wharfs, unleſs for the immediate uſe of the canal. A clauſe will be neceſſary, to puniſh perſons who are found throwing ballaſt or any kind of ſoil overboard or into the canal, by which it might be choaked up: it will alſo be requiſite, ſtrictly to prohibit the throwing of looſe ſtuff, as chalk, gravel, ſand, &c. by means of ſhovels, from heaps or barrows on the bank, into any barge, unleſs a broad and cloſe ſtage of boards was firſt laid to catch the ſtuff, which will unavoidably ſcatter, and to prevent its falling into the canal.

Neceſſary tackle ſhould be kept in readineſs, for weighing up ſuch barges that are ſunk, without delay, on account of the total interruption that ſuch will often occaſion to the navigation. Where a ſunk barge lies ſo that another barge cannot be floated on each ſide of it, the following method may be adopted: chains ſhould be looped round the ſunk barge and hooked, having four ends of ſufficient length proceeding from near the four corners of the barge, two empty barges ſhould be brought, one to each ſide of the ſunk one, and ſtrong beams of timber be laid acroſs each of theſe barges, and the ſpace between them; water ſhould then be admitted into each of the barges by their plugs, to ſink them almoſt to the water's ſurface, the plugs ſhould then be put in, and the four chains be faſtened tight to the croſs beams, when a pump ſhould be uſed in each of the barges to throw out the water, and as this is accompliſhed, if the chains are properly fixed, the barge will be buoyed up, often to the ſurface of the water, ſo that ſhe may be freed by pumping her; if not, ſhe muſt be ſhoved along, ſuſpended between the light barges, to ſome ſtrong crane, where ſhe can be further aſſiſted, or into ſome dock or ſhallower place, where ſhe can be relieved by a repetition of the ſame proceſs.

Several further *Regulations for working of Canals* require yet to be mentioned. They are ſuch as relate to the penalties that ſhould be provided in the act or by-laws for preventing bargemen from taking in above a certain weight, adapted to the ſize of their boat and the depth of the canal; and alſo for preventing ſuch boats from damaging the lock-ſils or bottom of the canal, or ſticking faſt to the interruption of other boats. The nature of the lading and the manner of diſpoſing it in the boat, ſo that the ſides of the bridges, &c. may not be injured, ſhould be duly attended to. Penalties ſhould be provided to puniſh thoſe bargemen who ſuffer their boats to ſtrike againſt any of the locks or bridges, or thoſe who ſuffer their barge to lie either for unloading or any other purpoſe, ſo as to obſtruct the paſſage of other boats. In ſome acts this penalty is fixed, by the hours that ſuch interruption continues, and at an increaſing rate. Boats left at wharfs or other places, on or by the line of the canal, ſhould be moored at both their ends. Bargemen ſhould be prohibited from fiſhing, or having tackle for ſuch purpoſe on board. It ſhould be provided, and made known by the by-laws, that barges or veſſels going one particular way on the line, and on each of the branches, ſhould give way for thoſe they meet or have occaſion to paſs; and on narrow canals or branches, it ſhould be provided, that when two barges that are meeting each other firſt come in ſight, or one of them hails the other, that which is neareſt to a paſſing place, ſhall ſtop at or go back to the ſame to let the other paſs. Common trading barges and veſſels, and all others, ſhould be prohibited from paſſing any locks or moving along the canal except in the day-time, and for this purpoſe it is uſual to divide the months of the year into three or four portions, and to ſpecify the hour both morning and evening in each, between which the canal is to be open. Light boats, for the conveyance of market-goods, parcels, &c. are allowed on ſome canals, as the *Grand Junction*, to paſs on during the night, their owner paying a ſpecified ſum for a licence for ſuch privilege, engaging to employ the moſt careful and experienced boat-men, and to make good all damage which ſuch boats may do to the works of the canal, or to the barges or property of other traders. Mr. *Thomas Pickford*, the great waggon proprietor, has ſubſtituted boats in place of many of his waggons, and which travel night and day, and arrive in London with as much punctuality from the midland and ſome of the moſt diſtant parts of the kingdom, as the waggons do.

As few of the tunnels are conſtructed wide enough for two wide barges to paſs each other therein, it may become neceſſary in ſuch caſes, where the tunnels are long, to eſtabliſh an overſeer at each end of the tunnel, where a baſon of ſufficient dimenſions for ſeveral boats to lie and paſs ſhould be provided, to ſuffer no barges to enter at either end for an hour, or other period, or until the laſt boat from the other end is come out, to prevent wide ones meeting others in the tunnel. If the number of wide boats be very ſmall in proportion to the narrow ones, the periods for the entry of narrow boats may be ofteneſt repeated, and wide boats might, in extreme caſes, be only ſuffered to paſs the tunnel between the two baſons after dark in the evening, when the other boats are lying ſtill on the canal.

Gentlemen's pleaſure-boats, and narrow ſhort huſbandry-boats, for the uſe of the occupiers of the lands on each pound, are often allowed at very eaſy rates, if not quite free of tolls; and ſometimes ſuch, as well as any other boats laden with manures and road-materials, are allowed to paſs the locks on the ſame conditions, at ſuch times only as the water runs over the lock-weirs, or is within a very ſmall quantity, as half an inch, of that height.

The regulations of veſſels *paſſing the Locks* are uſually very explicit in canal-acts, that boatmen may not ſuffer the water to remain in the locks longer than is neceſſary for their boats to paſs; that every boatman in going down a canal, ſhall, previous to his bringing his boat into any lock, ſhut the lower gates of ſuch lock and the cloughs thereto belonging, before he ſhall draw the cloughs of the upper gates; and, after he ſhall have brought ſuch boat through the lock, he ſhall then ſhut the upper gates before he ſhall draw the cloughs of the lower gates, and in going up the canal, ſuch boatman, as ſoon as he ſhall have paſſed his boat through the lock, ſhall ſhut the upper gates of the ſame, before he ſhall draw the cloughs of the lower gates, unleſs there ſhall then be a boat coming down the canal, in ſight of the ſaid boatman, in which caſe the lower gates of the lock ſhall be left ſhut, and the upper gates ſhall be left open; and in all dry ſeaſons, or where there ſhall be a ſcarcity of water in the canal, the boat ſo going up (if within ſight of a boat ſo coming down,) and at a diſtance not exceeding two hundred yards below a lock, ſhall paſs through ſuch lock before the boat coming down, and then ſuch other boat ſhall come down into the lock; and if there ſhall be more boats than one, below and above any lock at the ſame time, in any ſuch dry ſeaſon, within the diſtance aforeſaid (which diſtance ſhall be diſtinguiſhed by a poſt ſet up for that purpoſe), ſuch boats ſhall go up and come down at ſuch lock *by turns*, until all the boats have paſſed, by which means one lock full of water may ſerve two boats. A penalty ſhould be provided againſt any bargeman or other perſon, who draws the cloughs, except while barges are paſſing as above, or for leaving any clough open; as alſo againſt any lock-keeper or other ſervant of the company who gives undue preference to any boatman in paſſing the locks, or in unloading his barge at the public wharfs. Poſts ſhould alſo be provided by the ſide of the locks, for ſtrapping or ſtopping the velocity of boats before they enter the locks, and penalties ought to be provided againſt the winding of their rope or ſtrap round any part of the gates or lock, in order to ſtop a barge, except the ſtrapping-poſts before mentioned; after all, the engineer ſhould be careful to form the heads of the gates, and all other projecting points about his locks, of ſuch a ſloping or wedge-like form, that the rope would have no hold upon them, but ſlip off. A clauſe ſhould always be inſerted in the act, for making maſter boatmen anſwerable for all damage done by their ſervants, giving them, however, the right of recovering from their ſervants in all caſes of wilful damage or neglect. On ſome canals it is uſual, for the maſters to hire their men by the ton of goods which they navigate certain diſtances, inſtead of paying them by the day for their time.

For ſome time paſt, the rate of *Freight* on ſome canals, over and above the company's tonnage, has been two-pence per ton per mile, for unperiſhable goods, threepence per ton per mile for periſhable goods, and fourpence halfpenny for bulk goods. In times of diſtreſſing ſcarcity, like thoſe of 1795 and 1800, the committees of ſeveral canals, have permitted the paſſage of imported grain, going towards the interior of the country, toll free, with the laudable intention of lowering its price to the community.

The *Principles of conſtructing River Navigations* require ſome further notice in this place, in addition to the particulars which we have already had occaſion to notice reſpecting them in this article.

Mr. *Thomas Telford* has given an account of the navigation of the river *Severn*, which is printed in *J. Plymley's Agricultural Report of Shropſhire*, pages 284 and 317, from which we ſhall collect ſome particulars, and remark thereon, with the view of ſhewing by an example, what are the nature and extent of the difficulties which navigation has to contend with, upon natural rivers. This juſtly famous river is navigable up to Welchpool, a diſtance of 155 miles by water, from the mouth of the Bath *Avon* river; the extreme branch of this river may be traced for about 45 miles above Welchpool, to Plinlimmon Hill, and numerous other branches extend for great diſtances into the country on both ſides; the whole of this great length of river navigation was till lately unimproved by art, it having no locks, weirs, or other erections throughout its whole length for ſurmounting the numerous ſhallows and irregularities, which the current over variable *ſtrata* had formed in its bed. The firſt, or loweſt 42 miles of this river, extending to the city of Glouceſter, are very wide for great part of the way, and have a moſt rapid tide; but the laſt 28 miles are ſo crooked, that ſhips are ſaid to be often ſeveral days in paſſing it; on which account, a grand canal, calculated for veſſels of 300 tons burthen, was in the year 1793 projected and begun, between *Glouceſter and Berkley*, of 18½ miles in length, for avoiding theſe 28 miles of the river. From Glouceſter to Worceſter the diſtance is 30 miles by the courſe of the ſtream, the riſe in this length being 10 feet, or at the rate of 4 inches in a mile: from Worceſter to Stourport the diſtance by water is 13 miles and the riſe 23 feet, or at the rate of 1 foot 9 inches per mile: from Stourport to Bridgenorth it is 18 miles, and the riſe 41¾ feet, or 2 feet 4 inches per mile on the average; and, from Bridgenorth to the New Town at the junction of the *Shropſhire* canal, called *Coal-port*, the diſtance is about 7 miles, and the riſe about 19 feet, being a rate of about 2 feet 8 inches per mile. It was, we believe, that excellent and public-ſpirited individual, Mr. *William Reynolds*, the founder of *Coal-port*, who cauſed an account to be daily regiſtered, of the depth of the ſtream in the bed of the *Severn* river at that place, between the 7th of October 1789, and the 23d of December 1800, of which Mr. *Telford* has given us the particulars, except on 12 occaſions when the river had overflown its bounds and covered the uſual marks, on Sundays during ſome part of the time, the intervals of froſt in which the river was frozen over, and for three ſhort intervals, when unfortunately the experiment was by ſome accident ſuſpended. Theſe valuable materials we have examined with conſiderable care, and ſhall preſent our readers with ſome reſults therefrom, that will be of uſe in judging of the interruptions from floods, drought, and froſt, to which river navigations are liable; and we do not apprehend that this river is more ſubject to them than the Britiſh rivers are in general, excepting thoſe ſmaller ones like the Colne, the Wandle, and others, which are ſupplied principally by ſpring-waters. During all the months of *January*, in the above period of 11 years, ending the 6th of October, 1800, the river was twice overflown, (2d Jan. 1790. and 27th Jan. 1800,) and exceeded, we ſhould ſuppoſe, the depth of 16 feet, that being the greateſt depth at any time recorded; and ſeveral times, when no depths are inſerted to the great floods, it is ſtated in the table that the water was above all the marks: beſides theſe, there were 32 ſmaller floods, or times when the water had riſen, and was falling again for ſome days after; the higheſt of theſe had a gations, or in extending the navigation thereon above the tide-way, it is of importance to examine the ſtate of the whole country, to which the river in queſtion acts as a drain, to obſerve accurately whether cultivation, or the breaking up of lands, and the practice of draining have been going on, or are likely to be ſo in any conſiderable degree, within a reaſonable period; as alſo to obſerve particularly the ſtate and extent of the valleys and meadows, over which the waters are or have been ſpread in ordinary floods, and the probability of ſuch being further prevented by ſtraightening or enlarging the beds of the brooks and rivers, or embanking the courſes of the ſtreams; theſe, with the moſt correct information that can be obtained from different millers and others, who live on the banks of the river, or from ſcientific individuals, who have cauſed accounts to be kept of the height of the water, will be neceſſary data for determining the magnitude and nature of the works which will be neceſſary on the propoſed navigation.

Mr. *William Chapman*, in his *Obſervations*, often before quoted, *page* 74, when treating of the canals of China, which are in effect but new channels for a part of the ſtreams of their rivers, takes occaſion to introduce ſome uſeful obſervations on the crookedneſs and unequal ſections of rivers, and on the effects of ſhallows, weeds, and other impediments, upon the velocity and height of the ſtream, that we muſt reluctantly for the preſent paſs over, referring the reader to our article River. As an inſtance of the fall and velocity of large natural rivers we are told, that the Ganges for 60 miles, having the mean width of 3-4ths of a mile, and depth of 15 to 20 feet, was found to have a fall, in a direct line, through the immenſe flats and rice-fields on its ſide, of 9 inches in a mile, but by following all the bends of the river's courſe, the fall was reduced to 4 inches per mile, and its velocity therein did not exceed 3 miles per hour. On aſcertaining readily the velocity of ſtreams of water, and comparing the ſame with theory, ſee *Nicholſon's Journal*, 8vo. vol. iii. p. 32 and 87.

Mr. *William Chapman* ſeems to incline to the opinion, that locks may not always be eligible on river-navigations, and ſays (p. 87,) that “ during the flooded ſtate of rivers, all ſmall falls are equalized, as they neceſſarily riſe higher below than above a rapid; therefore I am far from ſaying, that running canals with a ſmall fall are not, in many inſtances, eligible on the ſhores of great rivers; and that well deviſed ſtops, eaſily opened and cloſed, (not ſuch as lift up like thoſe deſcribed in China, nor open againſt the ſtream as gates,) are not ſometimes preferable, to incurring the charge of locks. In other nearly ſimilar inſtances where locks are eligible, their piers and gates alone, will be ſufficient without any other floor or ſide walls, than a concave and battered pavement, continued through the bottom and up the ſides of the ſpace between the piers. The eligibility, and the particular conſtruction of theſe works, will much depend on the nature and extent of the beds of the rivers, the difference between their low and flooded ſtates, the height and alſo the permanency of their ſhores, and the quantity of floating ice.

The greater number of rivers through which new navigations are now required to paſs, will be found occupied by mills, at ſhorter or longer diſtances from each other, according to the fall of the water in moſt inſtances; at the tail of moſt of ſuch mills, will be found a large and deep pool, which the fall of water from the mill-courſes and flood-gates has torn and excavated, and a ſhort diſtance below this pool a ſhoal or bed of gravel, or other matters, will in general be found, that would prove ſo expenſive to remove, and would in general be ſo ſubject to accumulate again by a further excavation of the pool from the increaſed fall of the water into it, that it will in general be the cheapeſt and moſt effectual way to begin a new cut for the navigation below this ſhoal, and continue the ſame up by the ſide of the pool to the bank of the mill, wherein a pound lock muſt be conſtructed, either of timber or maſonry, for gaining the aſcent to the mill-dam or upper pound. In rapid rivers ſubject to great floods, the utmoſt care and attention of the engineer to the conſtruction of ſuch works will be neceſſary, to prevent their being demoliſhed by the firſt flood perhaps after their erection. Where mills do not intervene, and rapid and of courſe ſhallow places occur in the bed of the river which is to be made navigable, a ſide-cut muſt be begun from above ſuch ſhallow, and if practicable at the beginning of a conſiderable bend of the river which the ſide-cut may cut off and ſhorten; in continuing this ſide-cut downwards towards the place where the lock is to be placed, and the junction below the ſame is to be formed with the river below the ſhallow, care muſt be taken to conduct the ſide-cut, which is to be upon a level as far as the lock, as ſoon as poſſible acroſs the flat meadows to the borders of the high ground, along which it ſhould ſkirt, to the place of the lock, if this is practicable, on account of the width of the meadows; otherwiſe a counter-drain or parallel cut muſt be taken up from below the lock, as far as is neceſſary, on the land ſide of the ſide-cut, to drain off the water, and prevent a ſwamp or pond being formed above the lock and between the ſide-cut and the high ground, as is almoſt invariably done by the ancient mill dams on moſt rivers and ſtreams: it is, however, with the utmoſt care and precautions that the counter-drain ſhould be adopted, otherwiſe, in time of floods, when the meadows are overflowed, ſuch a current would ruſh into and down the declivity of the counter-drain as to endanger the tearing thereof, and of the bottom and ſides of the cut or bed of the river, into which it vented below the lock. We have ſeen large and expenſive ſluices erected upon and near to the vent of counter-drains circumſtanced as above, of greater height than the top of the floods, which were found neceſſary to be built, and kept ſhut on the approach of a flood to prevent the action of the counter-drain, until the flood had ſubſided ſo far as not to overflow the meadows adjoining the counter-drain. Acroſs the bed of the river at the moſt convenient place below and near the upper end of the ſide-cut, an opening-weir muſt be conſtructed, by which the water in the river can always be kept at a proper height for covering the ſhallows and bed of the river to a proper depth for the navigation; ſeveral of theſe opening-weirs have within theſe few years been conſtructed on the *Thames*, one of which near Windſor has been deſcribed and drawn by Mr. *Zach. Allnutt* in his *Conſiderations on the beſt Mode of improving the River Thames*, 1805, p. 22. It conſiſts of ſeveral ſtrong piles or poſts driven firmly into the bed of the river at 20 to 25 feet apart, in a ſtraight line acroſs the river: the intervals between theſe piles are driven and nicely filled up with pug-piles, or dove-tail piles, as before deſcribed in this article; theſe laſt are afterwards ſawed off ſtraight and even with the bottom of the river, and have a ſtrong and ſound ſill nicely fitted and ſpiked on to them, and into each of the large piles at its end; by this means the water is prevented from ſoaking or making its way, except through the rectangular openings between the ſeveral piles, which ſhould be at leaſt as high as the higheſt floods, and have their tops connected by ſtrong croſs pieces of timber bolted on to them; in theſe croſs pieces, and in the ſill below, a number of holes are prepared for placing at equal intervals as many upright pieces of wood, called rimers, with rebates in their ſides, for temporary gates to ſlide down in, and reſt againſt; after theſe rimers are put in, a ſluice or gate, with a tall handle to reſt againſt the upper, or croſs piece, is put in between each rimer; and, above theſe, another ſet of gates, called overfalls, with ſimilar handles, are fitted, to be occaſionally uſed in dry ſeaſons, when none of the water is to be ſuffered to eſcape, except by the ſide-cut and lock-paddles. In time of floods, all theſe gates, overfalls, and rimers, are taken away, by perſons who go in a boat for that purpoſe; which operation, we are told, can be performed in three hours, and the water is ſuffered to take its free courſe through the openings: as the water ſubſides, a few of theſe gates are put in at a time, leaving the water its courſe through the others, until all of them are in, when on any ſmall riſe of the water, the ſame falls over the tops of theſe gates into the bed of the river below; when a greater depth of water is wanted above, the overfalls or upper gates are ſucceſſively put in upon the others; theſe laſt being of ſuch a height that the water can fall over their tops before it would overflow the meadows in caſe of its riſing, and the men not attending or being expeditious enough in taking away the overfalls, and then the gates, if the progreſſive riſe of the river ſhould render it neceſſary. Mr. *J. Plymley* in his report before quoted, page 316, has given a plate of a weir of this ſort for a river, which is called a gate-ſluice, with 17 gates, but we have looked in vain for any deſcription or account thereof in his volume. In the *Thames* and ſeveral other rivers, *Jetties*, or *Weir-hedges* have formerly been made, for diminiſhing the width of the river below the ſeveral ſhoals, in order to make a deeper but narrower and more rapid current over the ſame, as is done, we are told, on the China canals; but the rapid and dangerous currents which theſe and the underwater weirs occaſion, particularly in high water times, have been ſo juſtly and loudly complained of, that we truſt the ſame will, ere long, give place to the ſide-cuts, pound-locks, and opening-weirs, above deſcribed. The principles on which jetties are made to raiſe the water in rivers, and the mode of calculating their effects may be found in *Nicholſon*'s *Journal*, 8vo. vol. iii. p. 35.

For improving the navigation of rapid, confined, and variable rivers, like the *Severn*, Mr. *Thomas Telford*, in *Plymley*'s *Report*, p. 287, has recommended the deepening of the lower part of the bed of the river in the ſhallow places, in order to equalize the declivity and current of the river: a very experienced engineer has ſuggeſted, that deepened ſhallows, without jetties or ſimilar conſtructions, would ſoon be again filled up in many caſes. In the higher parts, Mr. *T.* propoſes to erect ſolid and durable weirs of maſonry acroſs the river upon the ſhallow places, with ſide-cuts and pound-locks by the ſide of them, for the navigation; and the river when thus diverted, may, as he juſtly obſerves, be applied to many important purpoſes of machinery, and for irrigating of the meadows, which would thus be brought within its reach. There is no doubt but this method is practicable, and would ultimately anſwer well; but the expence would be very great of erecting ſubſtantial weirs, and making the banks of the ſide-cuts, and walls, and gates of the locks, high enough to prevent the floods from breaking over into them, a condition which ſeems neceſſary, if barges are to be able to proceed at all times; the towing-path ſhould alſo for the ſame purpoſe be made up with a regular ſloping bank next the river, preſenting no inequalities or projecting objects to catch or wear the towing-lines, ſo that its top or path ſhall be always above water. On a river which riſes 16 or 17 feet or more, theſe works would be attended with a moſt ſerious expence and difficulty, particularly where cliffs riſe almoſt perpendicularly up from the bed of the ſtream. Machinery on ſuch a ſtream, unleſs great expence indeed was incurred to obviate it, would be ſubject to have its work interrupted by every large flood: the working of barges on a river with ſuch cuts, locks, and towing-paths, as we have mentioned, would be attended with conſiderable difficulties; tall maſts muſt be uſed for attaching the towing-line in dry-times to bring the line on a level, or nearly with the horſes, and in floods it muſt be fixed lower down, or to a ſhorter maſt: and, in ſuch caſes, the utmoſt care might not always be able, where the works are neceſſarily confined by rocky banks, to prevent barges from ſometimes miſſing the entrance of the ſide-cut, and being precipitated down the current over the weir, and being ſunk. A towing-path, locks and banks of a leſs height, ſo that the floods would frequently cover them, beſides their being totally uſeleſs in ſuch times, would be liable to be damaged and waſhed away, (unleſs conſtructed in the moſt careful and expenſive manner,) and the cuts and locks to be filled up in a great meaſure by ſand, or gravel, in rapid rivers. Mr. *William Reynolds* ſet an example which has ſince been followed, on a great length of the *Severn*'s bank, of conſtructing a towing-path for horſes, inſtead of the devious way over projecting rocks, looſe ſands, mud, and every other obſtacle which the men who uſed, from time immemorial, to perform the ſlave-like office of hauling the barges along, were obliged to travel: we are not acquainted with the height of theſe new towing-paths, or whether they are at times, and how frequently, covered and uſeleſs by reaſon of the floods. Mr. *Allnutt* informs us, that one horſe commonly tows a barge of 130 tons burthen down the *Thames* above Richmond, at the rate of two and an half miles per hour. While on the running canals of China, *ſir George Staunton* obſerved a boat of a light conſtruction, with only 14 tons lading, of eight feet width of floor, about 10 feet width of water-line, and 50 of extreme length, drawing two feet three inches of water, and ſharp at the ends, dragged againſt a ſtream whoſe velocity was 5½ Engliſh miles per hour; and, although there were 28 trackers, or men hauling at the line faſtened to the boat, beſides three men in the boat poling it on, it advanced only at the rate of ¼ of a mile an hour; although the channel was not materially conſtructed in either width or depth of water-way, in proportion to the ſection of the boat. Mr. *Thomas Telford* has (p. 288.) propoſed another method of improving the *Severn* river, by collecting "the flood waters into reſervoirs, the principal ones to be formed among the hills in Montgomeryſhire, and the inferior ones in ſuch convenient places as might be found in the dingles, &c. along the banks of the river. By this means, the impetuoſity of the floods might be greatly leſſened, and a ſufficient quantity of water preſerved to regulate the navigation of the river in dry ſeaſons, and likewiſe to anſwer many other uſeful purpoſes, ſuch as the forming ponds for inland fiſheries, the ſupplying of artificial canals, and the watering of land. This, it is thought, might even prove the ſimpleſt and leaſt expenſive mode of regulating navigable rivers, eſpecially ſuch as are immediately on the borders of hilly countries." An engineer of the firſt reputation in his profeſſion (Mr. *Rennie*,) intimates, that after what has been ſaid reſpecting the exceſs of flood water in the river Roch above the ordinary ſupply, the idea of correcting the floods of the *Severn* by reſervoirs, muſt appear to be ridiculous. Mr. *William Jeſſop*, on another occaſion already referred to, ſays, that the rivers may be rendered nearly uniform throughout the year by reſervoirs.

The old clumſy ſtone or brick bridges upon rivers are a very principal interruption to the navigation thereon, by preventing the continuation of the towing-path in a place where it is generally the moſt wanted to ſurmount the rapid fall occaſioned by the contracted water-way under the bridge; the maſts of veſſels are alſo obliged to be ſtruck. Theſe circumſtances recommend the more general imitation of the ſpirited individuals near Coalbrook-dale, who have there erected two caſt-iron bridges over the *Severn*, whoſe ſingle and capacious arches remedy theſe evils. We have already ſpoken of them under the article Bridge, and in the preſent one, and therefore proceed to the only remaining ſubjects that at preſent occur to us, relating to the deepening of rivers: the *heaving of ballaſt*, or taking up of ſand, gravel, or other looſe or ſoft matters from the bottom of rivers, is uſually performed by a ſtrong pole, having a flat ring or hoop of iron fixed on its end, to which a ſtrong leathern bag is faſtened, like what is called a landing-net among fiſhermen; or for taking up gravel only, a fine and ſtrong net is uſed inſtead of the leathern bag; the edge of this hoop is made ſharp, ſo as to ſtrike into the bottom, when a man puſhes it down by its pole; near to this hoop a rope of conſiderable length is faſtened, which is held by a man that ſtands at the head on the gunwale of a barge at anchor, while another man at the ſtern ſtrikes the hoop and bag into the bottom, the man at the head then hauls at the rope to drag the bag along and ſcrape the bottom, while the other man ſhoves down the pole to which it is attached, until the bag is filled with ſand, gravel, or other matters, which are wanted to be got up; the man with the rope then advances nearer to the other, and pulls up by the rope while the other does the ſame by the pole, and brings the bag over the ſide of the veſſel, and empties its contents into the hold or room of the barge. If the bottom be hard, or the bag large, two or more men are employed to pull the rope, and ſometimes a winch and roll on which the rope or chain winds, are uſed for dragging the hoop and bag along the bottom, and for hauling the ſame up to the ſurface, when the man at the pole finds that the bag is full, and begins to pull inſtead of puſh by the pole: this is the employment at Woolwich of a great number of convicts, inſtead of their being tranſported. Solid matters or rocks when they happen to want excavating, below the level that the water can be drawn off to, or the ebb of the tide, ſeem to require all the ſkill and reſources of the engineer. Near to the entrance of the new *Eaſt India Docks*, in the way of ſhips in the river *Thames* at Blackwall, is a rock or large ſtone of exceedingly hard ſilecious pudding-ſtone, conſiſting, as we have been informed, of the hard ſmall chert pebbles which abound ſo much near London, embedded in a cement ſtill harder than themſelves; detached blocks of which pudding-ſtone are by no means uncommon in the London *ſtrata*; this rock is ſo hard that no tool is capable of boring it, and though for ſome years paſt the committee for improving the port of London have been occaſionally advertiſing for perſons who were willing to undertake or contract for removing the upper part of this rock, about 40 feet in length and 30 in breadth to the depth of about 18 feet, yet the rock ſtill remains. The conduct of this buſineſs is now, it is ſaid, committed to Mr. *Jeſſop*, an able engineer; and we hope ſoon to hear of this dangerous impediment being effectually removed.

Having now given the principles and practice of canal-making, and of river-navigations and rail-ways, as forming one great, compound, and connected *Syſtem of Inland Communication*, we now proceed to give a conciſe account of all the different eſtabliſhments of this kind in the United Kingdoms. This part of the preſent article, although far ſhort of the degree of perfection which we were deſirous of giving it, has been attended with great labour, in reſearch for the ſcattered, and often ſcanty materials, that are to be found reſpecting many of theſe undertakings, which will ever remain as ſtupendous monuments of Britiſh enterprize and ſpirited exertion.

Reſpecting the method of arrangement, we found it inexpedient to follow thoſe who have attempted to give an account of ſome of theſe concerns, in the order of time in which they were projected or begun; becauſe ſo many of them, in diſtant places, were projected at the ſame periods, while ſome were quickly begun and completed, and others remained a great while in hand.

The great length of ſome of theſe works or undertakings, the ſhortneſs of others, their various directions and their general and multiplied interſections with each other, rendered any geographical arrangement of them, as from north to ſouth, or otherwiſe, equally difficult and improper. We truſt, therefore, that our readers will approve of the plan which we have adopted, of giving the whole of theſe undertakings, rivers, canals, rail-ways, &c. in one alphabetical ſeries, arranged according to the *incorporate, or parliamentary name* of each, where the ſame are under ſpecial acts of parliament. And, as many important lines of canal have been ſurveyed and deſcribed, but never ſince were executed, we have thought it right to preſerve the memory of many of ſuch, by giving them a place in the regular ſeries, but printing their titles in Italics, to diſtinguiſh them from the works exiſting or now proceeding with, which will be printed in ſmall capitals. Our principal aim has been to exhibit, as conciſely as poſſible, the principal features of each concern, and to trace its connecting points with all the other adjoining ones; by the help of which, it is hoped that our readers may be able to trace out and comprehend this great and unparalleled ſyſtem of improved inland communication, which has, and will continue to operate ſo powerfully towards our national proſperity.

Aberdare Canal. This undertaking was begun under an act of the 33d of Geo. III.; its general direction (beginning at its loweſt end, as we ſhall always do in theſe deſcriptions) is about N.W.; it is $7\frac{1}{2}$ miles in length to Aberdare, beſides an extenſion thence, in nearly the ſame direction, by a *rail-way* for $8\frac{1}{2}$ miles further; it is ſituate in the county of Glamorgan in South Wales, and is not far from the ſea-coaſt, or very greatly elevated above the ſame. The great coal and iron mines, and works near Aberdare, Furno-Vaughan, &c. ſeem its principal objects. It begins in the *Glamorganſhire* canal near Eglwyſila, and terminates in the *Neath* canal at Abernant. The firſt $4\frac{1}{2}$ miles of the canal are level, and thence it riſes 40 feet to Aberdare. Mr. *Thomas Dadford*, jun. is the engineer. A lock of ſufficient height, with proper ſide-weirs, was made near the lower end, to prevent the *Glamorganſhire* canal from ſuffering by floods, that may make their way into and through this canal. The company may raiſe 33,500l. ſhares, 100l. each. The rates of tonnage are too long for ſuch an abridged account as this; they will be found in *Phillip's 4to. Hiſtory of Inland Navigation, Appendix*, p. 38. Boats 12 feet long and 5 feet wide may be uſed, free of toll on the pounds, by the adjoining occupiers, for their huſbandry purpoſes. At Aberdare works are ſome curious machines; one is ſaid to be a pair of water-wheels, working one below the other like a figure of 8.

Aberdeenshire Canal. Acts 36 and 41 of Geo. III.— The general direction is about N.W. for 19 miles in length, in Aberdeen county in Scotland; it is near the ſea-coaſt, and is not greatly elevated in any part; the principal objects ſeem the ſupply of the town Aberdeen, the exportation of granite ſtone from the famous quarries on its banks, and to form a communication between the harbour of Aberdeen and the vales of the river Don. It begins in the tide-way in the *Dee* river in Aberdeen harbour, and follows the courſe nearly of the Don river, in which it terminates at Inverury bridge; and paſſes the pariſhes of Old Machar, Newhills, Dyce, Kinnellar and Kintoſe.

toſe. The riſe is 170 feet by 17 locks; the width of the canal is 20 feet, and depth of water $3\frac{1}{2}$ feet. The harbour of Aberdeen, (connecting with the *Dee* river near its mouth, at the S. E. end of this canal), was ſurveyed many years ago by Mr. *John Smeaton*, and lately by Mr. *Thomas Telford*, who has, in his reports to parliament, recommended making it capable of receiving ſhips of 18 or 20 feet draught of water. It appears that this canal was completed and opened in June 1805. The company might by the firſt act raiſe 30,000l., ſhares 50l. each; and by the 2d act 20,000l. more might be raiſed on 20l. ſhares, bearing 5 per cent. intereſt. Half-mile ſtones to be erected. Pleaſure-boats of twelve feet long, and four broad may be uſed on the pounds.

**ADUR RIVER.** The general direction of this river is nearly north for 12 miles in the county of Suſſex: its objects are the import of coals, deals, &c., and the export of farming produce. New Shoreham and Steyning are conſiderable towns on or near it. It commences in the ſea at Southwick below Shoreham harbour, and terminates at Bines-bridge in Weſt-Grinſted. In September 1805, notices were given of the application for an act for extending this navigation from Bineſbridge to Baybridge in Shipley.

*Alford and Wainfleet.* In July laſt (1805) a ſurvey was ordered for an intended canal from Wainfleet haven to the town of Alford, the general direction of which line is nearly north, and about 12 or 13 miles in length, in the county of Lincoln: this line is near the coaſt, and ſeems but very little elevated above the ſea: its principal objects ſeem the ſupply of Alford, and the export of huſbandry produce: it is propoſed to paſs the town of Burgh. Wainfleet haven is ſaid to be a very good harbour for trading ſhips.

**ANCHOLME NAVIGATION.** Act 42 of Geo. III.—The general direction of this navigation is nearly ſouth: it is almoſt ſtraight (except the laſt four miles), and about 26 miles in length, in Lincolnſhire. It is ſituate within 15 or 20 miles of the coaſt, and runs nearly parallel thereto through fens and level grounds for great part of its length. Its objects, beſides a better drainage of theſe fens by a wide and ſtraight cut, inſtead of the old courſe of the river Ancholme, ſeems the ſupply of Market-Raiſin and of Caiſtor (by means of the *Caiſtor* canal, which joins it at South Kelſey), and the export of huſbandry produce. It begins in the tide-way in the *Humber* river near Wintringham, and extends to the town of Market-Raiſin, paſſing near the town of Brigg.

**ANDOVER CANAL.** Act about the 30th of Geo. III. Its general direction is nearly north, and pretty ſtraight, following the courſe nearly of the *Anton* river (which is navigable to Rumſey) for $22\frac{1}{2}$ miles in length, in Hampſhire; it is near the coaſt, and not very greatly elevated in any part above the level of the ſea. Its general objects ſeem to ſupply fuel to the country, and to export its ſurplus of farming produce. It connects with the *Southampton and Saliſbury* canal, the latter entering it at Red-bridge, and leaving it again at Kimbridge mill. The town of Southampton, near its ſouth end, is the 68th in the order of Britiſh population, having 7,913 inhabitants. This canal begins in the tide-way in *Southampton-water* at Redbridge, and terminates at Barlow's mill near the town of Andover; the towns of Rumſey and Stockbridge being on its courſe. Its riſe is equal to $176\frac{1}{4}$ feet, and it is fed at its upper end from Pilhill brook. This line was ſurveyed by Mr. *James Brindley* in the year 1770, and an act propoſed, but the oppoſition of the land-owners prevented one being obtained, until it had been again ſurveyed in 1789, by Mr. *Robert Whitworth*; in a few years after which it was completed for uſe.

*Arklow and Ovoca.* In 1792, Mr. *William Chapman* ſurveyed the vales of the Ovoca river in Ireland, and recommended to render the improvement of Arklow harbour, which was then intended, more beneficial to the adjacent country, by connecting therewith a ſyſtem of ſmall canals up the rapidly aſcending vales of the Ovoca, by riſing 70 or 80 feet at once in proper places, by ſome of the ſubſtitutes for locks, of which we have before ſpoken.

**ARUN RIVER.** This navigation has nearly a north direction for 15 or 16 miles in the county of Suſſex. To ſupply coals, and export farm produce, ſeem its principal objects; which are facilitated by the *Arundel* canal, that joins it near Stopham bridge, and would be further accompliſhed, were the *Surry iron rail-way* extended to it at Wiſborough-green bridge, as was propoſed in the year 1801. It proceeds from the ſea at Arundel haven to Wiſborough-green bridge, paſſing the town of Arundel in its courſe.

**ARUNDEL CANAL.** Act 31 of Geo. III.—The general direction is weſt for about 11 miles, following the courſe of the river Rother, in the county of Suſſex. It is about 12 or 13 miles from, and nearly parallel to, the ſea-coaſt, above which it is but little elevated. The ſupplying of the inhabitants with coals, and exporting of huſbandry produce, ſeem the principal objects of this canal. It commences in the *Arun* river near Stopham bridge, and terminates at the lower plat near Midhurſt, with a ſide cut of about one mile in length to Haſlingbourn bridge in Petworth pariſh. The line being through the pariſhes of Stopham, Coldwaltham, Bury, Fittleworth, Ergdean, Coates, Sutton, Petworth, Duncton, Burton, Tillington, Lodſworth, Selham, Amberſham, Eaſebourn, Woolavington, and Midhurſt. This canal is the property of that public ſpirited nobleman the *earl of Egremont*, but open to the uſe of the public, on paying certain ſpecified tolls.

**ASHBY DE LA ZOUCH CANAL.** Act 34, Geo. III.—The general direction of this canal, though in a ſerpentine courſe, is nearly north, 40 miles in the counties of Warwick, Leiceſter, and Derby. It commences near and almoſt upon the grand-ridge on its eaſtern ſide, and near its other extremity is tunnelled through a yet higher ſide-branch of the great ridge. The conveying away of the coals and lime-ſtone from this laſt ridge, and the ſupply of the towns on its borders by means of the *Coventry* canal, with which it connects, are its principal objects. Coventry, which is near it, is the 24th town for population in Britain, having 16,034 inhabitants; while Hinckley, which is upon the line, has 5,070 perſons, and is the 120th in order. Market Boſworth and Aſhby-de-la-Zouch are other conſiderable towns near or on the line; the commencement of which is at Marſton bridge near Nuneaton, on the *Coventry* canal, and the termination is by a *rail-way* (of $3\frac{3}{8}$ miles) at Ticknal lime-works; there alſo is a *rail-way* branch of $6\frac{3}{4}$ miles to Cloudſhill lime-work; another to Mr. *Wilke*'s Meaſham collieries of 5 miles: a cut of $2\frac{1}{8}$ miles to Swadlingcote coal-works; another of $\frac{7}{8}$ mile to Staunton lime-works; another is to be made to Stanton-Harrold park (if deſired by the *earl of Ferrers*, the proprietor thereof); and there is another ſhort cut of 200 yards to Hinckley wharf. The firſt $30\frac{3}{8}$ miles of this canal are level, extending to Oakthorpe engine on Aſhbywoulds; and forming with parts of the *Coventry* and *Oxford* canals, a level of 73 miles in length, being, without the branches, the longeſt in the United Kingdoms, and rendered more ſingular by being on ſo high a level, as to croſs the grand ridge without a tunnel. From Oakthorpe engine to the Boothorpe feeder, 1¾ mile, is a riſe of 140 feet, thence the ſummit-level of 4¼ miles extends, through the principal tunnel to its north end; thence to the Cloudſhill branch, ¼ of a mile, is a fall of 84 feet, and thence to Ticknal works is it level. The Cloudſhill, Swadlingcote, and Hinckley branches, are level with the line, and the Staunton branch falls 28 feet therefrom. On this canal are two tunnels, one near Aſhby-de-la-Zouch town of 700 yards in length, and the other near Snareton of 200 yards. At Shackerton and at Snareton there are aqueducts; and at Boothorpe a reſervoir with a ſteam-engine for pumping up its water into a feeder for the ſummit-level of the canal. The rail-way branches, and ſome part of the canal were completed previouſly to May 1802, but it was not until about May 1805, that the whole of the line was completed and opened. The company were authoriſed to raiſe 200,000l., the amount of ſhares 100l. each. Public wharfs are provided on Aſhby woulds, and at Green-hills near Sutton Cheney. Sir *George Beaumont*, the owner of collieries at Coal-Orton, to which rail-ways had previouſly been made at great expence connecting with the *Leiceſter* navigation, is to be compenſated, and the company may purchaſe certain annual quantities of his coals for ſuch purpoſe. This company is alſo bound to indemnify the *Leiceſter* navigation, and to allow them a rate of 2s. 6d. per ton on all coals carried upon this canal or its branches beyond a certain point from the coal-pits in the neighbourhood of their water-levels or rail-ways. To the *Coventry* canal company they are alſo bound to pay 5d. per ton for all coals, and ſome few other articles, which paſs upon any part of this canal or its branches, and afterwards upon any parts of the *Coventry*, the *Oxford*, or *Grand Junction* canals, or from either of thoſe canals to this: and for duly enforcing this laſt compenſation, the *Coventry* company are authoriſed to erect toll-houſe and bars, and ſtation their own collectors when and where they may chuſe upon the works belonging to this company. The rates of tonnage allowed, vary from 2d. to ¾d. per ton per mile on different goods, while ſome articles are to be allowed to paſs toll free. Our limits will not allow of ſtating theſe particulars, which will be found in *Phillips's Hiſtory of Inland Navigation*, 4to. *Appendix*, p. 128. In June 1796, a ſurvey was made by Mr. *Whitworth* for connecting the north end of this canal, by means of the propoſed *Commercial* canal, with the *Trent and Merſey* and the *Cheſter* canals, and opening the long wiſhed for communication between London, Hull, Cheſter, Liverpool, Mancheſter, &c. for river-boats of 40 tons burthen. In conſequence of the failure of this ſcheme, in the January following, it was propoſed to extend this canal to the *Trent* at Burton, and to the *Trent and Merſey* at Shobnall.

Avon River, (*Bath.*) The general direction of this navigation is about S. E., in length 26 or 27 miles, by a crooked courſe in the county of Somerſet, and ſkirting that of Glouceſter: it opens into the *Severn* river, and is moſt of it a tide-way. The objects of this navigation are as various, as the imports and exports of ſuch large places as Bath and Briſtol, and a populous neighhourhood require; beſides its connection with the *Kennet and Avon* canal, and the other canals therewith connected. The city of Briſtol is the 7th place in the order of Britiſh population, having 68,645 inhabitants, and Bath is the 12th, with 32,200 inhabitants. The commencement of this river is in the King's road in the *Severn* river (here about ſeven miles wide), and its navigation ends at Bath, near the commencement of the *Kennet and Avon* canal. About the year 1803, or 1804, an act was obtained by the *Briſtol Dock* company, for converting about 70 acres of the old and crooked courſe of the *Avon* into a vaſt floating-dock for ſhips, and to cut a new channel for the river. About May 1804, theſe works commenced, under Mr. *W. Jeſſop*, and great progreſs has been made towards their completion. Two caſt-iron bridges are erecting over the *Avon* near theſe works; one of them from Clifton-down to Leigh-down will, it is ſaid, be 200 feet high above the ſurface of the water, and the other ſufficiently high for ſhips to paſs under it. That eſſential appendage, a towing-path, was wanting on this river, until the above company was eſtabliſhed, who are making one on each ſide of the river, from Pill up to Briſtol, and one thence to Hanham mills; from which place up to Bath, a towing-path is propoſed to be extended, under an act, for which notices have juſt been given; this laſt part of the river is alſo intended to be improved in other reſpects. We have, alſo, lately ſeen a notice for a further application to parliament by the *Briſtol Dock* company, for erecting a dam and overfall, with ſluices, &c. at Red-cliff in Bedminſter, to keep up the water for the new floating docks, and for other amendments of their former acts; in 1796 it was propoſed that the *Kennet and Avon* canal ſhould be extended to this river at Briſtol. At Bitton below Bath, it was lately propoſed, that the *Glouceſterſhire* rail-way ſhould connect. In 1762, Mr. *Stratford* gave a deſign for a new ſtone bridge in Briſtol of one arch, 150 feet ſpan, and 32½ feet high, which Mr. *John Smeaton* examined and approved; and in 1765, the laſt mentioned engineer gave a deſign and eſtimate for a floating dock nearly as above; after which, Mr. *Campion* made other deſigns.

Avon River, (*Saliſbury.*) The direction of this navigable river is very nearly north, and its length near 30 miles, in the counties of Hants and Wilts. The general objects of this navigation are the ſupply of Saliſbury, and the adjacent country, and the export of its agriculture products. Near Saliſbury, it connects with the *Southampton and Saliſbury* canal. Saliſbury contains 7,668 inhabitants, and is the 70th place in the order of our population; Fording-bridge, Ringwood, and Chriſt-Church, are likewiſe conſiderable towns on the line. The commencement is at the ſea in Chriſt-Church harbour, and termination at Saliſbury. The locks and works of this navigation had not been long completed, before a ſudden flood happened, which ſwept away the greater part of them; in which ſtate it lay until 1771, when Mr. *James Brindley* ſurveyed its courſe, and recommended a new canal by the ſide of the river; this was not however adopted, but the river-works have ſince been repaired; and the imperfection of them, was, we believe, among the moſt powerful motives for the adoption, in 1795, of the *Southampton and Saliſbury* canal above mentioned. Mr. *Smeaton* examined Chriſtchurch harbour in 1764, and recommended another pier to be built weſt of the old one.

Avon River, (*Stratford.*) The general direction of this navigation is about N. E. by a crooked courſe of near 40 miles in Worceſterſhire and Warwickſhire: the lower end thereof is but a few feet higher than the tide-way. The trade thereon is very various, depending in a great meaſure on the connection which it forms between the *Severn* river and the *Stratford* canal. Tewkſbury, Perſhore, Eveſham, and Stratford, are conſiderable towns upon it. It commences in the river *Severn* at Tewkſbury, and terminates at Stratford on Avon, near the junction of the *Stratford* canal. *George Perrot*, eſq. is the proprietor of this navigation, and entitled to certain tolls, which were not to be leſſened by the new communication with the *Severn*, which the *Worceſter and Birmingham* and *Stratford* canals were to open, but they were, by the act for the latter concern (33 Geo. III.), to make good any falling off in theſe tolls. About 1792, the *Stratford and Croperdy* was propoſed to proceed from this river at Stratford to the *Oxford* canal.

Axe River. The general direction of this navigation is almoſt S. E. for about 11 miles in length by a crooked courſe in the county of Somerſet: it is but little elevated. Its chief objects are the import of coals, and export of farm produce, Axbridge being the only town of any importance upon it. It commences in the Briſtol channel near Uphill, and terminates near Axbridge. An act of the 42d Geo. III. paſſed, for altering and improving that part of it which is between Bleydon and Axbridge. At Blean the *Briſtol and Taunton* canal was once propoſed to join this navigation; as the *Exeter and Uphill* alſo was deſigned to do at Uphill.

*Axemouth and Langport.* In 1769, Mr. *James Brindley* ſurveyed this line, which is nearly north, and about 30 miles in length, in Devonſhire, Dorſetſhire, and Somerſetſhire, croſſing the ſouth-weſtern branch of the grand ridge. The objects of it ſeem to have been the ſupply of coals, exporting the products of the country, and opening a communication between the ſouth coaſt and the Briſtol channel, by means of the *Parret* river. Axminſter, Chard, and Ilminſter are the principal towns which this line was to approach; commencing in the tide-way at Axemouth, and terminating in the *Parret* river at Langport.

Ayre and Calder Navigation. Act 9 or 10 of Will. III. The general direction of the *Ayre* river is nearly weſt, for about 40 miles by a ſerpentine courſe, from which the loweſt part of the *Calder* river branches, nearly ſouth-weſt, by a crooked courſe of about 15 miles, all in the Weſt Riding of Yorkſhire. The firſt of theſe rivers, though an internal one, begins near the level of the tide-way, and no parts of either of the navigations thereon are much elevated. The objects of this navigation were at firſt very conſiderable, in the imports and exports of the populous, manufacturing, and coal country through which it paſſes, and they are greatly increaſed, ſince it has formed part of the grand communications between the port of Hull, or the German Ocean, and the towns of Mancheſter and Liverpool, or the Iriſh Sea, by means of the *Leeds and Liverpool*, *Rochdale*, and *Huddersfield* canals, and others joining them. It connects near Snaith with a branch of the *Don* or Dun river; at Leeds, with ſome conſiderable *rail ways* extending to collieries from the coal-ſtaith; near Wakefield it connects with the *Barnſley* canal. Leeds is the 8th place in point of population in Britain, having 53,162 perſons, and Wakefield the 64th, with 8131 perſons; Hunſlet, near it, is the 104th, with 5799 perſons; Snaith, Selby, and Pontrefact, are alſo conſiderable places near this navigation, which begins in the *Ouſe* river near Armyn (to which place 50 and 60 ton ſloops come up), and terminates its north-weſtern branch at Leeds in the *Leeds and Liverpool* canal, and its ſouth-weſtern branch at Wakefield in the *Calder and Hebble* navigation. It has alſo a branch of canal about $4\frac{1}{2}$ miles to the *Ouſe* river at Selby, for ſhortening the diſtance to York, &c.; and another of $1\frac{1}{2}$ mile near Mathley, between the *Ayre* and *Calder* rivers, for ſhortening the voyage between Leeds and Wakefield. The boats generally uſed hereon are 56 feet long, $13\frac{1}{2}$ wide, and draw 3 feet water, with 28 tons of lading: theſe boats often go down the *Humber*, and round the coaſt, to the *Welland* and Great *Ouſe* rivers. The proprietors are authoriſed to exact ſo high a rate of tonnage as 16*s.* per ton in winter, and 10*s.* in ſummer, between Leeds and the *Ouſe*. It is provided in the *Huddersfield* act, 34 Geo. III., that if any communication is hereafter made with that canal to the eaſtward, the proprietors of this are to be compenſated. The oppoſition of theſe parties proved fatal, in 1769, to a canal which Mr. *Brindley* ſurveyed between *Selby and Leeds*.

Barnsley Canal. Act 33 of Geo. III. The firſt part of the courſe of this canal is ſouth, and the remainder weſt, about 15 miles in length, in the Weſt Riding of Yorkſhire: its weſtern end is conſiderably elevated above the level of the ſea. The principal objects of it ſeem to be the export of coals and paving-ſtones, and forming a ſhort communication with Rotherham and Sheffield (by the *Dearne and Dove* canal, with which it connects at Eyming wood near Barnſley), and Leeds, Wakefield, Halifax, Mancheſter, Liverpool, &c. Wakefield is the 64th town in the order of population, with 8131 perſons; Barnſley is alſo a conſiderable town. This canal commences in the lower part of the Calder river, or *Ayre and Calder* navigation, a little below Wakefield town, makes a turn when it arrives at the Dearne river, and terminates at Barnby-bridge near Cawthorn; there is a branch of $2\frac{1}{2}$ miles to Haigh-bridge in Wooley pariſh, and rail-way branches to Barnſley town 1 mile, and to Silkſtone $1\frac{1}{2}$ mile. From the *Calder* to the junction of the *Dearne and Dove* canal, about 9 miles, is a riſe of $120\frac{1}{3}$ feet: this is effected by three locks together, near Agbridge, having a low level or ſide-cut brought up to near the upper pound, with a ſteam-engine for pumping up the water again, which is let down by the lockage; by 13 other locks near Watton, and a long ſide-cut, from which engines pump up the water to ſupply the pound above theſe; and, near Bargh-bridge, by 4 other locks, a ſide-cut, and engine. On the Haigh-bridge branch there are alſo 7 locks together, with a low ſide-cut, and a ſteam-engine for pumping up the water required for lockage. At Eym is an aqueduct-bridge. This canal is adapted to the uſe of the ſame ſized boats as navigate the *Calder*. It is provided, that any rail-ways or ſtone-roads, that may be made northward from Barghbridge (or mill) ſhall be diſcontinued or removed, if a cut ſhall be made from the *Calder and Hebble* navigation, to connect herewith; alſo, that the ſteam-engine near Warmfield ſhall be ſo conſtructed as to burn its own ſmoke, to prevent any nuiſance to the inhabitants. The company were authoriſed to raiſe 97,000l., ſhares, 100l. each. This canal was completed and opened 8th of June 1799. The rates of tonnage on different articles are various: ſome fixed at 6d. to 4d. for the whole length of the canal; and various others at 3d. to $\frac{1}{2}$d. per ton per mile, with ſeveral exemptions, rates of wharfage, &c. See *Phillip's Hiſtory*, 4to. *App.* p. 40 to 43. The engineers were Mr. *William Jeſſop*, Mr. *William Wright*, and Mr. *Goll.*

Barrow River (*Ireland*). This is one of the rivers, for the improvement of whoſe navigation the Iriſh parliament granted ſeveral ſums of the public money, between the years 1753 and 1771, amounting to 13,600l. It is probable that leſs than the half of this amount, raiſed and expended by individual proprietors, with that circumſpection which ſelf-intereſt can alone inſpire, would have effected what, we are told, this expenditure has left very imperfect. At Portarlington and at Moneſteraven this river was to be joined by different branches of the *Grand Canal.*

Basingstoke Canal. This line of canal was firſt propoſed in 1772, as an extenſion of, or appendage to, the canal intended for ſhortening the courſe of the navigation of the river *Thames*, between *Reading and Maidenhead*; but it was ſome years before the firſt act for this was obtained, in 1778; the other act is the 33 of Geo. III. The general direction of this canal is nearly weſt, by rather a crooked courſe of 37 miles in length, in the counties of Surry and Hants; the ſummit-pound thereof of 22 miles in length is upon a high level, near the ſouth-eaſt branch of the grand-ridge on its north ſide. The principal objects thereof ſeem the import of of coals, and export of timber and agricultural produce, from and to the *Thames*. Baſingſtoke and Odiham are conſiderable towns on or near its line, which commences in the *Wey* river at Weſtley, (about two miles from its junction with the *Thames*,) and terminates at Baſingſtoke. A cut of 6 miles in length, and level with the ſummit-pound, was propoſed northward to Turgis Green, but has not yet been begun, as we underſtand. The firſt 15 miles from the *Wey* river has a riſe of 195 feet by 29 locks to Dadbrook, (the part at each lock being about 7 feet) from whence to Baſingſtoke it is level: 45 ton boats are uſed on this canal. At Grewel is a tunnel, part of which interſects the chalk ſtrata, (about $\frac{3}{4}$ mile in length) that had the misfortune of falling in; but the ſame has, we are told, been ſubſtantially repaired. At Alderſhot there is a large reſervoir for the ſupply of this canal, (which was begun in 1788 and completed in 1796, at the expence to the proprietors of 160,000l.) and a feeder from the river Lodden. There are 72 bridges over the canal, and ſeveral culverts acroſs, to convey the water from the upper to the lower lands. The company were authoriſed to raiſe 186,000l. The prices of freight from Baſingſtoke to Hamborough wharf, London, for coarſe and heavy goods, was, in 1800, 15s. per ton; to the dockyards, as far as Deptford, 16s.; and to Blackwall docks, 17s. per ton for timber, &c. The length of a paſſage is three or four days. In the year 1796 there was an intention of extending a branch from near Grewell tunnel, of about 22 miles in length, to the navigation that connects with *Southampton water*; about 1794 there was an expectation of its being joined by the canal which will next be mentioned; and in 1801, notices were given of an intended cut from Chilton-moor to Bagſhot-green in Windleſham; for want of theſe or ſome other junctions that ſhall throw a greater trade into it, this canal has, though improving, been as yet rather unproductive to the ſhare-holders. In 1800 there was a propoſal for extending the *Grand Surry* to meet this canal at the Wey river.

*Baſingſtoke and Hampſtead.* About the year 1794, a line of canal was projected, and notices given, extending from the *Baſingſtoke* canal at that town, to the *Kennet and Avon* canal at Hampſtead, 2 miles above Newbury, the length of the line was ſaid to be 22 miles; we have ſince heard nothing of this ſcheme.

BELFAST to LOCH NEAGH. This line of canal was begun under an act of the Iriſh parliament ſeveral years ago, for forming a communication with the ſea at Carrick-fergus Bay and the above inland lake or loch, as alſo for exporting marble from the quarries thereof near its line.

*Belper Canal.* In September 1801, notices were given for a propoſed canal, rail-ways, &c. from the *Cromford* canal at Bull-bridge, to Black-brook-bridge, through the pariſhes of Crick, Heage, Aſhley, Hay, Belper, and Duffield; all in Derbyſhire.

*Biggleſwade and Hertford.* Several years ago a propoſal was made, for joining the *Ivel* river at Biggleſwade with the *Lea* river at Hertford, by means of a canal paſſing the town of Hitchin, by which an internal communication between Lynn and London would be opened; but the difficulty of ſupplying a ſummit-level near Stevenage with water, ſeems a greater obſtacle than the expected trade would pay for ſurmounting.

BIRMINGHAM (*old*) CANAL. Acts the 8th, 9th, 11th, 23d, 24th, and 34th of Geo. III. the laſt but one of which acts, unites the concerns of this company with thoſe of the *Birmingham and Fazeley* canal below; but as theſe canals were conſtructed and remain under diſtinct proviſions in the acts, and take different directions from the town of Birmingham, where they meet, we have deviated from our uſual rule and continued them ſeparate in our account. The general direction of this canal is about S. E. and $22\frac{1}{2}$ miles in length by a crooked courſe, through the counties of Stafford, a detached part of Salop and Warwick: it ſkirts along near the grand-ridge on its eaſtern ſide, at ſo high a level as to croſs it near its northern end without any deep cutting or tunnel; and, in that high ſituation is wholly ſupplied by reſervoirs for flood waters, or ſteam engines which pump up the water again, after it has been let down for lockage, or out of old and diſuſed coal-pits. The principal objects of this canal are the carrying away of the coals from the numerous mines on its banks and branches, and the manufactured goods of Birmingham to Liverpool, Mancheſter, &c. It connects near Farmer's-bridge at Birmingham, with the *Worceſter and Birmingham*, at Tipton Green with the *Dudley* canal, and near Wolverhampton with the *Wyrley and Eſſington* canal. The great towns on and near the ſame are, Birmingham, the 6th in the order of population, containing 73,670 inhabitants: Wolverhampton, the 33d, with 12,565 perſons; Walſal, the 47th, with 10,399 perſons; Dudley, the 49th, with 10,107 perſons; and Bilſton, the 87th, with 6,914 perſons: in the centre of ſo large and active a population as this, the wonder in a great meaſure ceaſes, that this canal, conſtructed and carried on under ſuch peculiar diſadvantages, ſhould nevertheleſs have proved the moſt lucrative concern of the kind in the kingdom. This canal commences in the *Staffordſhire and Worceſterſhire* canal at Alderſley or Autherly, near Wolverhampton, and terminates in the *Birmingham and Fazeley* canal, at Farmer's-bridge, near the upper end of the town of Birmingham, the line being double in two places, viz. at Tipton, where a tunnel of near 1000 yards, and a canal of $1\frac{1}{8}$ mile in length, between Bloomfield and Deepfield has been made ſince 1794, for avoiding a zig-zag loop round Tipton hill, of 4 miles; alſo at the Smithwick locks, where two canals with 3 locks on each have been made, ſince 1787, for accommodating the immenſe traffic which is hourly paſſing. The collateral cuts are very numerous, the principal one extends from near Bromwich to the town of Walſal, by a crooked courſe of $8\frac{1}{4}$ miles; from this branch nine or more branches ſtrike off to as many coal-works, &c. on each ſide of it; the termination of ſome of theſe are, near Wedneſbury town, at Broad-water engine, Toll-end, Bradley, Bilſton, David's Ram-farm, and other coal-works: the lengths of all which are ſeveral miles. From the line there is alſo a cut of about one mile, to Oker-hill coal works; another to Meſſrs. *Bolton and Watt's* famous Soho foundery, and another to Newhall-ring baſon and wharf in Birmingham. In the firſt mile and three quarters, the riſe from the *Stafford and Worceſter* canal is 151 feet, by means of 20 locks, then $18\frac{1}{4}$ miles are level; a deſcent of 18 feet then takes place, by 3 locks (on each of the two branches before-mentioned); the remainder of the line about $4\frac{2}{3}$ miles is level, to the junctions of the *Birmingham and Fazeley* and the *Worceſter and Birmingham* canals at Farmer's bridge. The Walſal branch, where it leaves the line, has a fall of 18 feet by means of 3 locks, and about two miles further near Rider's-green, a further fall of 48 feet by 6 locks, whence to Walſal is level; the Toll-end branch has a riſe of 15 feet by 3 locks, and the Bradley of 20 feet by 4 locks, all the other cuts being level. This canal was originally cut 28 feet wide at top, 16 at bottom, and $4\frac{1}{2}$ deep; but by conſtant wear and widening it is now 40 feet wide at the top on the average. The locks are 70 feet long and 7 wide in the clear, and the boats carry about 22 tons. At the coal-wharf near Farmer's-bridge, and at its ſide cuts, 40 boats can unload at the ſame time; the Newhall-baſon of 2 acres, is for the unloading and loading of timber, ſtone, ſlates, and general merchandize, no wharfage is charged at either of theſe wharfs. Originally, there was a ſummit-level on the line of about one mile in length at Smithwick, 18 feet higher than at preſent, (of which 1000 yards was deep-cutting, 28 feet in the deepeſt part) and it was ſupplied until 1787, by a ſteam-engine at each end; when, owing to the increaſing trade, this ſummit was cut down, and 6 locks removed, making the deep-cutting one mile in length, and 46 feet deep in one place; and though this work was $2\frac{1}{2}$ years in hand, and coſt 30,000l. yet it was ſo managed, that the paſſage of boats was only 14 days interrupted thereby. There is a conſiderable reſervoir near Oldbury, and another near Smithwick, with feeders for conveying their waters into the ſummit level. The celebrated Mr. *James Brindley* was the original engineer, and on the 6th of November 1769, he completed 10 miles of the line and branches next Birmingham, by which coals were firſt brought by water to that great town from near Wedneſbury, and their price to the inhabitants was lowered at once from 15s. and 18s. to 7s. 6d. per ton! In October 1772, the line was opened, and in June 1799, the Walſal branch was completed. The proprietors were authoriſed to raiſe 115,000l. before the conſolidation of this and the *Birmingham and Fazely* concerns. At firſt the ſhares of this were 100l. each; but were by the ſecond act 9th Geo. III. reduced in number and made 110l. ſhares; thoſe created ſince the 24th Geo. III. are 170l. ſhares. The original tonnage on all goods, (excepting lime ſtone) was $1\frac{1}{2}$d. per ton per mile, and for lime-ſtone and lime, $\frac{1}{2}$d. per ton, except for manuring of the lands of the adjoining proprietors, and road materials were allowed to paſs toll-free; but the ſubſequent alterations in the ſeveral acts ſince would much exceed our limits to mention, thoſe who are deſirous of further information will find it in Mr. *John Cary's Inland Navigation*, 4to. pages 36 to 45. By the *Dudley* act, 25th Geo. III. this company are entitled to certain tolls on goods paſſing on or off of that canal to this; and, by the *Wyrley and Eſſington* act (32 Geo. III.) to other rates for the junction therewith; all which may be ſeen as above. About the year 1790, a cut was propoſed from this canal (inſtead of the Dudley junction) to Netherton collieries $12\frac{1}{2}$ miles, by a tunnel through the grand-ridge near Oldberry, of 2,078 yards, and 184 feet under the hill: in 1796, a foundery and large works belonging to Meſſrs. *Bolton and Watt*, were erected on the banks of this canal 5 miles from Soho. This canal extending acroſs a country full of coal, it was apprehended that the ſinking of the old pits might damage the ſame, and the company have power to enter and examine mines to prevent their working within 12 yards of the canal, except by paſſages of 4 feet wide, and 6 feet high: for want of more ſtrict attention to this, ſome of the branches near Wedneſbury have been undermined and broke in, ſo as to cauſe the canal to be abandoned in that part. From ſome of the old worn out coal-mine ſhafts near Bilſtone, a lambent blue flame ariſes in the night, of which a great deal has been ſaid and written. Proprietors of mines within 1000 yards of this canal, or its branches, may make *rail ways* thereto.

BIRMINGHAM AND FAZELEY CANAL. Acts 23d, 24th, 25th and 34th of Geo. III.; the ſecond of theſe acts is for conſolidating this concern with the old *Birmingham* above; but each part of the canal remains ſubject to its own original regulations, as above obſerved, and the laſt but one is for conſolidating $5\frac{1}{2}$ miles of the *Coventry* canal herewith, ſubject to the original powers of the *Coventry* act (8th Geo. III.) under which it was ſet out and made. The general direction of this canal is S. W. excluſive of the late Coventry part, which lies in a direction between N. and N.W. from the original termination at Fazeley: the length of the whole is $20\frac{1}{2}$ miles in the counties of Stafford and Warwick: the whole of this line of canal is conſiderably elevated, but particularly the S.W. end in the town of Birmingham, which is ſituate near the grand-ridge on its eaſtern ſide. The great objects of this canal are, the export of the manufactures of Birmingham towards London or Hull, and of coals; the ſupply of grain and other articles to Birmingham and its populous and buſy neighbourhood; it connects with the *Wyrley and Eſſington* canal near its commencement at Whittington-brook, with the *Coventry* at Fazeley, with the *Warwick and Birmingham* at Digbeth, and with the *Worceſter and Birmingham* canal near its termination at Farmer's-bridge. Birmingham, as before obſerved, is the 6th Britiſh town, with 73,670 inhabitants, and Tamworth near the line, is a conſiderable place. The commencement of this canal is in the detached part of the *Coventry* canal, at Whittington-brook, and its termination in the old *Birmingham* canal at Farmer's-bridge at the top of Birmingham town. From the N.E. entrance of the town of Birmingham, a branch ſkirts the town to the lower part of it called Digbeth, and there connects with the *Warwick and Birmingham* canal. From the detached part of *Coventry* canal at Whittington-brook, to its junction with the line of that canal at Fazeley, and thence paſt the ſmall aqueduct bridges near Middleton-hall, about $8\frac{1}{4}$ miles are level with the *Coventry* canal; from thence to the aqueduct bridge over the Tame river at Salford, $9\frac{3}{4}$ miles, has a riſe of 90 feet by 14 locks, thence to the Digbeth branch, near $1\frac{1}{2}$ mile, has a riſe of about 71 feet by 11 locks; thence to the old *Birmingham* canal at Farmer's-bridge, about $1\frac{1}{2}$ mile, is a riſe of about 85 feet by 13 locks; the Digbeth cut, of about $1\frac{3}{4}$ mile in length, has a fall of 40 feet, by 6 locks to the *Warwick and Birmingham* canal. The width of this canal is about 30 feet, and its depth $4\frac{1}{2}$ feet. The locks are 70 feet long and 7 wide in the clear, carrying boats with about 22 tons of lading. There are a wharf and baſon at Digbeth for the accommodation of the lower part of Birmingham. The Salford aqueduct bridge has 7 arches over the Tame river of 18 feet ſpan each. The Digbeth cut is tunnelled or rather arched over in the town of Birmingham; there is alſo a ſhort tunnel on the line where the Liverpool road croſſes. The *Coventry* company being unable for want of money to proceed with the eſſential part of their line, between Fazeley and Fradley, where it joins the *Trent and Merſey* canal, the latter company for the ſum of 500l. over and above the actual expences, undertook to complete this length, by agreements of the 29th October 1783, which the act (of 23d of Geo. III. above) confirmed; this they accompliſhed, the half neareſt to Fradley in January 1787, which the *Coventry* company in Oct. 1787 purchaſed of them, agreeable to the 23d Geo. III. (which occaſions them now to have a detached length of canal); the other half, between Whittington-brook and Fazeley, was completed in October 1789, and on payment of the coſt thereof by this company, it was conveyed and made over to them, agreeable to the act above quoted. On the 12th of July, 1790, the aqueduct bridge at Salford being completed, as well as the line of canal, the ſame was opened, and the water communication between Birmingham and Hull or London, was thereby effected. The ſums of money to be raiſed for this canal, were not diſtinguiſhed in the acts from what was intended for the extenſion and improvement of the old *Birmingham* canal, the amount of each ſhare was 170l.; but the act 24th Geo. III. limiting the number of ſhares to 500, they ſeem now to be variable. The rates of tonnage are too complicate for us to attempt their particulars, and we muſt refer the readers to *J. Cary's Inland Navigation*, pages 40 to 44, and pages 75 and 77. By the *Warwick and Birmingham* act (33d Geo. III.) certain duties are ſecured to this on goods paſſing from or to that canal, which may be ſeen in *Cary*, page 44. It is provided that the tonnage per mile on coals, is to be the ſame on this and the *Coventry* and *Oxford* canals.

*Biſhopſtortford and Cambridge.* In the year 1785 Mr. *John Phillips*, in a quarto treatiſe, recommended a line of canal from the *Stort* river, at Biſhopſtortford, to the *Cam*, at Cambridge, either by way of Littlebury and the Granta river, or near to Royſton by the upper part of the Cam; which might be done, he ſays, for little more than 20,000 l. but no levels, or other eſſential particulars are given; nor do we hear of any ſuch, when Mr. *R. Dodd* again revived this idea in 1803, and wiſhed to make this line part of his *North London* canal.

*Biſhopſtortford to Wilton.* In 1789 Mr. *John Rennie* was employed by ſeveral gentlemen of Eſſex to ſurvey and report on a line of canal from Hiſs, near Wilton, on the Brandon or Little *Ouſe* river, at the edge of the fens in Suffolk, to the *Stort* river at Biſhopſtortford; the diſtance from the little *Ouſe* to Ugley, the beginning of a propoſed tunnel (of ¾ of a mile) near Eſſingham, 45¼ miles, with a riſe of 251¼ feet; thence to Fuller's-end, near Eſſingham, 2⅗ miles, and level; and thence to the *Stort* at Biſhopſtortford, 4½ miles with 80 feet fall; a cut was propoſed to Burwell on a branch of the *Cam* river, and it was to croſs the *Lark* river. Several large reſervoirs were deſigned, and three tunnels, two of them being neceſſary to reach the town of Saffron-Walden, and to miſs Audley park. The eſtimate was 175,000 l. and a bill was brought into parliament, in 1790, for the ſame, but it there met a fatal oppoſition.

BLACKWATER NAVIGATION (*Ireland*). This river falls into Loch Neagh, and for extending a navigation therefrom to the Dungannon and Tyrone collieries, the Iriſh parliament, between 1753 and 1770, granted various ſums of the public money, amounting to 11,000 l.; a canal with 8 locks, terminating in a baſon, was conſtructed before Mr. *Davis Dukart* the engineer was employed thereon; who, finding the three miles with 200 feet riſe, which remained to do to reach the Tyrone collieries, to be too great for a canal with locks, he conſtructed, about 1776, four water-levels, with three inclined-planes, of 70, 60, and 50 feet riſe, to connect them, on which ſmall boats were made to aſcend and deſcend, as we have already mentioned, theſe being the firſt *inclined-planes* for boats brought into uſe in the United Kingdoms; it appears, however, that theſe were ſoon laid aſide in this place, and a *rail way* was ſubſtituted. This navigation was intended to connect with the *Newry* canal.

BLYTH RIVER. This river, between Northumberland and a detached part of the county of Durham, appears to be navigable but a ſmall diſtance above Blyth harbour; but we underſtand it has ſeveral conſiderable *rail-ways* connecting with it, for bringing down the produce of the collieries to the ſhipping.

BOYNE RIVER (*Ireland*). This is one of the rivers on the eaſt coaſt of Ireland, for which the parliament, between 1768 and 1771, granted 9,507 l. for improving its navigation. At Edenderry it was propoſed to be joined by a cut from the *Grand Canal*.

BRADFORD CANAL. Acts 11 and 42 Geo. III. The general direction of this ſhort navigation is ſouth nearly, and 3 miles in length, in the Weſt Riding of Yorkſhire. It is not conſiderably elevated: its objects are the export of coals, iron, and ſtone, the produce of the neighbourhood of Bradford, and the ſupply of Bradford town, which is the 95th in the ſeries, with 6,393 inhabitants. It commences in the *Leeds and Liverpool* canal at Winhill, in Idle pariſh, and terminates at Bradford, where *rail ways* of conſiderable extent connect with it, one of them goes to the collieries and iron-works on Wibſey Slack; and the deſcent is ſo ſteep that the waggons run down without horſes, having their velocity regulated by a man who rides behind and uſes the convoy or brake upon the wheels, as occaſion requires. From the *Leeds and Liverpool* canal to Bradford is a riſe of 81 feet by 8 locks; the width of the canal at top is 24 to 30 feet, and its depth is 5 feet; the locks are of the ſame width and length as thoſe of the *Leeds and Liverpool* canal. The company were empowered to raiſe 6000 l. in 100 l. ſhares. Boats paſſing the whole or any part of the diſtance on this canal are to pay 6 d. per ton for clay, bricks, ſtone, coals, lime, dung, and manure; and 9d. for every ton of iron, timber, and all other goods. This canal was finiſhed in 1774. The laſt act was found neceſſary, in order to make good the title to ſome lands which had been long before purchaſed for the works.

BRECKNOCK AND ABERGAVENNY CANAL. Acts 33 and 44 of Geo. III. The general direction of this canal is about N.W. 33 miles in length, in the counties of Monmouth and Brecknock in South Wales; it begins a few miles from the coaſt, and ſoon after comes near and follows the courſe of the Uſke river, no part of it being very greatly elevated. Its objects are the exportation of coals, iron, and other mineral products of the country round Abergavenny, by means of the *Monmouthſhire* canal, and the ſupply of Pontypool, Abergavenny, Crickhowel, and Brecon towns, that are near its courſe. It commences in the *Monmouthſhire* canal, 1 mile from Pontypool, and terminates at the town of Brecon; it has ſeveral *rail-way* branches: viz. to Abergavenny 1 mile; to Wain-Dew collieries and iron-works 4¾ miles (near 2½ miles of this laſt being double on each ſide of the brook); and, to Llangroiney 1¼ mile. From the *Monmouthſhire* canal, the firſt 14½ miles are level, to 3 miles above the Abergavenny branch, thence to Brecon is 18½ miles, with a riſe of 68 feet. Near its commencement it croſſes the little river Avon, on an aqueduct, and ſhortly after paſſes a tunnel of 220 yards in length. The engineer is Mr. *T. Dadford* jun. The Wain-Dew rail-ways, and the canal above them, up to Brecon, appeared to be finiſhed in June 1802, and by this time we expect the whole is completed, or nearly ſo. The company were at firſt authorized to raiſe 150,000 l. and a further ſum by their ſecond act, ſhares 100 l. each. The rates of tonnage are to be the ſame as thoſe on the *Monmouthſhire* canal, which ſee in *J. Phillips's Hiſtory*, 4to. *App.* p. 18. Horſes, mules, and aſſes are to pay 1 d. and cows, or neat cattle ½ d. each at certain toll-gates on the rail-ways. The *Monmouthſhire* canal, on account of the great benefit this will confer on it in tonnage, agreed to pay this company in March 1794, the ſum of 3000 l. In May laſt (1805) it was propoſed to extend a rail-way branch from this canal to connect with the river *Wye*.

*Bredon Rail-way.* About the year 1793 it was in contemplation to make a rail-way and canal from the famous lime-works at Bredon to the *Trent* river, oppoſite to Weſton Cliff; and in conſequence, a clauſe is inſerted in the *Derby* canal act, of 33 Geo. III. binding them to make a cut from the *Trent* at Weſton Cliff to the *Trent and Merſey* canal, which runs parallel with the *Trent*, whenever this ſcheme ſhall be adopted, in order to give this lime a readier courſe into Derbyſhire.

BRIDGEWATER'S CANAL. Acts 32 and 33 of Geo. II., the 2d, 6th, (*Trent and Merſey act*) and 35th of Geo. III. The general direction of the principal line of this canal is nearly N.E. (and not a great way from its eaſtern end, a main branch goes off in a N.W. direction nearly); the length is 40 miles, in the counties of Cheſter and Lancaſter. It begins in the tide-way; above which the whole of it is elevated 82 feet at low-water, except about 600 yards, which the locks occupy to gain this aſcent. The great objects which induced the late excellent and patriotic *duke of Bridgewater* to undertake and to expend a princely fortune on the completion of this canal were, the ſupply of the town of Mancheſter with coals from his eſtates near Worſley; the cheaper and more expeditious conveyance of goods, between Mancheſter and Liverpool, than the *Merſey and Irwell* river navigation then furniſhed; and between both of theſe places and the interior and moſt remote parts of the country, by means of the *Trent and Merſey* (which it joins at Preſton Brook,) and its connecting canals. Other and more direct communications have ſince been made between it and the interior and eaſtern parts of the kingdom, by means of the *Rochdale* canal and thoſe connecting therewith. Mancheſter is the 2d place in Great Britain for population, having 84,020 inhabitants, Liverpool the 4th with 77,653 inhabitants, and Warrington the 45th with 10,567 inhabitants, theſe towns being near this canal. The commencement of this canal is in the eſtuary of the *Merſey* river at Runcorn-gap, and one of its terminations in the *Rochdale* canal at Caſtle Field in the town of Mancheſter, the other (or Worſley branch) is at Pennington near the town of Leigh, the junction of theſe branches being at Longford bridge; near Mancheſter there is a communication with the *Merſey and Irwell* navigation, and *Mancheſter Bolton and Bury* canal, by means of Medlock brook. Under the town of Mancheſter are arched branches of the canal of conſiderable length, from one of which coals are hoiſted up by a coal-gin, through a ſhaft out of the boats below, into a large coal-yard or ſtore-houſe in the main ſtreet, at which place the duke and his ſucceſſors, are by the firſt act bound to ſupply the inhabitants of Mancheſter at all times with coals at only 4d. per cwt. of 140lb.; a circumſtance which muſt have had a great effect on the growing population of this immenſe town within the laſt 40 years. At Worſley is a ſhort cut to Worſley mills, and another to the entrance baſon of the famous under-ground works or tunnels, of 18 miles or more in length in different branches and levels, for the navigation of coal-boats; ſome of which are as much as 60 yards below the canal, and others 35½ yards above the canal; theſe laſt, to which the boats aſcend by means of an *inclined-plane*, that we have already deſcribed, extend to the veins of coal that are working at a great depth under Walkden Moor. Moſt of theſe tunnels are hewn out of the ſolid rock; from the lower one, the coals in boxes are hoiſted up out of the boats, as they are in Mancheſter town mentioned above, and the whole of the lower works are prevented from filling with water, by large pumps worked by the hydraulic machine, which we have already mentioned in this article, and the water is thereby always kept at the proper height for navigation on the lower canal. Near Worſley, a branch of about 1½ mile in length, proceeds on to Chat-Moſs and there ends, acroſs which celebrated moraſs, it was by the firſt act intended to proceed, to the *Merſey and Irwell* navigation at Hollin Ferry near Glazebrook; but, like the cut propoſed by the ſide of the Merſey to Stockport (7½ miles with a riſe of 60 feet) was never executed, and the neceſſity for them is now in a great meaſure done away, by other plans which have been carried into effect. The riſe of 82 feet in the firſt 600 yards from the *Merſey*, by 10 locks, is the only deviation from one level on this canal (except in the Worſley coal-mines above mentioned); and this length of level-water is further increaſed; by 18 miles on the *Trent and Merſey* canal which connects therewith, making in all 70 miles of level. The width of the canal at top is 52 feet on the average, and depth 5 feet; the boats that navigate between Worſley mines and Mancheſter are only 4½ feet wide, the others are 50 ton boats or upwards; there are alſo numerous boats for paſſengers; large warehouſes have been built for goods, at the Caſtle Field in Mancheſter adjoining the canal.

Beſides the tunnels under Mancheſter and at Worſley mines, we have been through a ſhort one in paſſing a gentleman's houſe and a church, we think at Groppenhall. On this canal are three principal aqueduct bridges over the *Irwell* at Barton, where it is navigable, and over the Merſey and Bollin rivers, beſides ſeveral ſmaller ones, and many road-aqueducts. There are alſo ſeveral large embankments, one over Stretford meadows, is 900 yards long, 17 feet high, and 112 feet wide at the baſe; that at Barton bridge is 200 yards long, and 40 feet high; at Bollington is alſo a ſtupendous embankment. The principal feeders for this canal are Worſley brook, and the mine-water there collected, the Medlock brook at Mancheſter, and the lockage of the *Trent and Merſey* canal; and water, which never was ſcarce in this canal, muſt now abound, ſince the increaſe of ſupply by the lockage of the *Rochdale* canal.

Mr. *James Brindley*, the engineer, owed much of his well earned fame to the happy contrivance and complete execution which he diſplayed in every part of this great concern; ſince the deceaſe of Mr. Brindley, Mr. *Gilbert* and Mr. *Benjamin Sothern* his Grace's agents, have done themſelves great credit, by the maſterly manner in which they have conducted the canal concerns of their noble employer, and improved and extended his works, as Mr. *Thomas Bury* has alſo in the mining department, ſo intimately connected therewith. The tunnelling at Worſley, and the canal between that and Mancheſter, were begun immediately on the paſſing of the firſt act; on the 17th of July, 1761, the Barton aqueduct was completed, and coals were ſoon after conveyed thereby to Mancheſter. On the 31ſt of December, 1772, the 10 locks at Runcorn were opened; in Auguſt, 1774, two packet-boats began to proceed regularly part of the way between Mancheſter and Liverpool, and on the 21ſt of March, 1776, the whole of the works which were then intended were finiſhed; the extenſion to Leigh has been made ſince 1795. The illuſtrious *duke of Bridgewater*, juſtly ſtiled *the father of Britiſh Inland Navigation*, died greatly lamented in March 1803, and left this immenſe concern, (which coſt at firſt 220,000l. it was ſaid, and probably in the whole twice that ſum, as the tunnelling at Worſley alone has been eſtimated at 168,960l.), to *earl Gower*, the preſent proprietor, whoſe ſecond ſon is to inherit it; the net profits are ſaid now to be from 50 to 80,000l. annually. The tonnage has not been increaſed ſince the firſt act, although the length of the canal has been increaſed to nearly four times what was at that time intended; boats may navigate the whole courſe or any part on paying 2s. 6d. per ton. Veſſels paſſing out of the *Trent and Merſey* at Preſton-Brook and into the *Merſey* at Runcorn, or the reverſe, pay 1d. per ton per mile for that diſtance; and all veſſels paſſing to or from the *Rochdale* canal to this canal at Mancheſter are to pay, for paving ſtones 4d. per ton, and for all other articles 14d. per ton. It is provided, that flour ſhall not pay any tonnage on this canal, if the wheat whereof it was made had already paid. Irrigation, or watering of meadows, is practiſed in a very judicious and profitable manner, by water let out of this canal at Worſley and other places. The price of land-carriage for goods between Mancheſter and Liverpool was, on the paſſing of the Duke's third act, 40s. per ton, and by the navigation on the *Merſey and Irwell* 12s. per ton, but his Grace limited his price to 6s. per ton: yet, ſuch has been the increaſing trade of theſe two places, that it was in 1794 ſeriouſly maintained, and made the ground of another propoſed navigable communication, by a junction of the *Mancheſter Bolton and Bury*, and the *Leeds and Liverpool* canals, that both the Duke's canal and the river navigation were inadequate to carry the trade between Mancheſter and Liverpool, and that the moſt frequent and ruinous delays were experienced by the merchants. In 1802, we find the idea again revived of a cut from the *Leeds and Liverpool* canal to the Leigh branch of this canal. About 1772, the *Liverpool and Runcorn* was propoſed as an extenſion of this canal from Runcorn; in 1799, the *Mancheſter Bolton and Bury*, was propoſed to be joined directly with this canal, by means of aqueducts over the Irwell and Medlock at Mancheſter.

*Briſtol and Glouceſter*. In the year 1797, we were told, that ſurveys were making of the line for a propoſed canal from the Bath *Avon* at Briſtol to the *Severn* at Glouceſter, and alſo, of a continuation of the ſame acroſs the Stratford *Avon* to the *Severn* at Worceſter.

*Briſtol and Taunton*. Several years ago, a canal was propoſed, we are told, from the *Avon* river at Briſtol to the town of Taunton, with cuts to Nailſea collieries, to the *Axe* river at Brean, and to the town of Langport, but we are not further acquainted with its objects or particulars.

BROTHIC RIVER. This is a ſmall river on the coaſt of Angers county in Scotland, and navigable, we believe, but a ſmall diſtance up from the harbour of Aberbrothick at its mouth, which harbour is of great antiquity, and appears to have had piers and works erected for its improvement and ſecurity, ſo long back as the year 1194; the ſpring tides here riſe 15 feet.

*Bude and Hatherleigh* canal. In 1793, the *earl of Stanhope* propoſed a line of water-levels and rail-ways, between the ſea in Bude Haven, on the Briſtol-Channel part of the Corniſh coaſt, and the neighbourhood of Hatherleigh in Devonſhire, paſſing the town of Holdſworthy, for carrying up ſea-ſand, (which in this bay conſiſts of a congeries of broken ſhells), as a manure, and exporting of farming produce; the riſe on this line was upwards of 500 feet, up which his lordſhip propoſed, that his 2 ton boats ſhould be conveyed at proper intervals on inclined-planes, whoſe peculiarities have been already mentioned in this article. In April laſt (1805), we find a ſcheme on foot, for improving the harbour of Bude and building a pier for the protection of ſhips.

*Bude and Launceſton*, or the Tamar canal. This is one of the few inſtances, in which an act (14th of Geo. III.) was obtained, without any part of the ſcheme having been carried into effect. Mr. *Edmund Leach* the projector of this, in his Treatiſe on Inland Navigation, propoſed, that it ſhould proceed from the tide-way in Bude Haven, Cornwall, on the Briſtol Channel, and proceed near to Launceſton, and into the tide-way in the river *Tamar* near Calſtock, in the S.E. part of Cornwall. There was a proviſion, that the powers of the act were to ceaſe in 10 years, if the canal was not proceeded with; it was propoſed, to purchaſe only 39 feet wide of land, and not to be allowed to cut more than 39 inches deep into the earth on the lower ſide, in any part, except for docks, &c.; the canal to be 21 feet wide at top and 12 at bottom, with a towing-path on each ſide of it, 10 ton boats to be uſed; the direct diſtance of the two extreme points is only 28 miles, but owing to the extremely ſerpentine courſe of the level which was to be followed, its propoſed length was 81 miles, and was eſtimated to coſt 1000l. per mile. Locks were not to be uſed, but *inclined-planes* for boats of Mr. Leach's contrivance, of which we have already given an account in this article. From the ſea at Bude, was to be a plane of 54 feet riſe, thence a level of 6½ miles, then a plane of 120 feet riſe, then 4 miles of level, and a third plane of 66 feet riſe to the ſummit-level, which extended 34 miles to Launceſton town, and 34 miles beyond; then, a plane with a deſcent of 120 feet, then 2½ miles of level, and a fifth plane, at Kelly Rock, of 120 feet fall to the *Tamar* navigation. A cut or feeder of 3 miles was propoſed, from the Tamar is Lanells to St. Tankins on the Pack-ſaddle (being a low point on the ſouth-weſtern branch of the grand-ridge). Mr. Leach, however, tells us, that theſe levels are not to be entirely depended on, and mentions 258 feet as the elevation of the Pack ſaddle. The principal objects of this canal were the carrying of ſalt and ſhelly ſand from the coaſt into the interior of the country as manure (an object ſince in part accompliſhed by the *Tamar manure*, and the *Stover* canals). In 1785, Mr. *Leach* wiſhed to revive this project, and to ſhorten the courſe to 40¾ miles, by cutting down the ſummit 18 feet, and making a tunnel of 100 yards; and to form another communication with the ſea at Weedmouth-bay, where the ſame broken ſhells abound; the coſt was now eſtimated at 53,100l.

BURROWSTOWNESS CANAL. The act of the 8th of Geo. III. (for the *Forth and Clyde* canal) eſtabliſhed a ſet of proprietors for this canal; its direction being nearly weſt for about ſeven miles in the counties of Linlithgow and Stirling, in Scotland; from the tide-way in the harbour of Borrowſtowneſs, on the Firth of *Forth*, to the *Forth and Clyde* canal, near its eaſtern termination at Grangemouth. Its objects are ſtated to be, the avoiding part of a dangerous and difficult navigation on the *Forth*, and for improving the lands of Kinniel and Beercrofts, through which it paſſes. Burrowſtowneſs, Linlithgow and Falkirk are conſiderable towns near this line. The depth to be ſeven feet, and width and ſize of the locks at the entrance proportionable thereto, the canal being level. The company are authoriſed to raiſe 8,000l. the ſhares to be 50l. each. The tonnage of lime, lime-ſtone, and iron-ſtone ½d. per ton per mile, all other goods and articles (except road-materials and manures) 1½d. per ton per mile.

BURRY RIVER. This river, or eſtuary, connecting with the Briſtol Channel, is between the counties of Caermarthen and Glamorgan, in South Wales, and is navigable a diſtance of ten or eleven miles to Lwghor or Llougher, in nearly an eaſt direction; at the flats in Llanelly it is joined by the *Caermarthenſhire* rail-way, and another rail-way has lately been laid from this river to the Penclawdd copper-works: in 1801, the *Llandorry and Llanelly* canal was propoſed to join at the Spitty in Llanelly; and, in October 1805, a wet dock was propoſed to be made on the eaſt ſide of the Llanelly pier, to communicate with the *Caermarthenſhire* rail-way.

*Caerdyke*. This is an artificial channel or ditch, as ancient as the time of the Romans in this country, from the *Nen* river, a little below Peterborough, to the *Witham* river, three miles below Lincoln, of near 40 miles in length; it appears to have been very deep, though now almoſt grown up; and it is rather doubtful whether it ever was intended or uſed for the purpoſes of navigation.

CAERMARTHENSHIRE RAIL-WAY. Act 42 Geo. III.— The general direction of this line of rail-way is nearly north for 14 or 15 miles in Caermarthenſhire; it commences on the coaſt, and is not very greatly elevated in any part; its general objects are the export of coals, iron, lead, &c. from the country through which it paſſes. Llandillo Vawr is the only conſiderable town near its courſe. It commences in the *Burry* river, at the new baſon for ſhips, at the flats near Llanelly, and terminates at Caſtel y-Garry lime-works in Llanſihangel Aber-bythick. In the deep cuttings for this rail-way near Munydd Mawr ſeveral unknown veins of good ſtone-coal were diſcovered, and ſome of lead ore; in November 1804, the embankment near this place, conſiſting of more than 40,000 cubic yards of earth was completed, with the rail-way upon it. In October 1805, it was propoſed to make a wet-dock for ſhips at the commencement of this line, on the eaſt ſide of Llanelly pier; in 1801, the *Llandovery and Llanelly* canal was propoſed to paſs through nearly this line of country.

Caistor Canal. Act 33 Geo. III.—The direction of this line is eaſt 9 miles in the county of Lincoln; it is but little elevated above the ſea. Its objects ſeem the importation of fuel and other articles, for the ſupply of Caiſtor town, and the export of farming produce: it commences in the *Ancholme* navigation, at South Kelſey, and terminates at the town of Caiſtor. The company were empowered to raiſe 25,000l., ſhares 100l. The rates of tonnage are from 2d. to 8d. per ton per mile on different goods, with other rates for corn, &c. See *Phillips*'s 4to. *Hiſtory*, p. 47. All ſtores for the uſe of government, or materials for roads, to paſs free at all times, and manures for the adjoining lands, when the waters run over the lock-weirs. In 1801, there was a propoſal for extending this canal from Caiſtor, along the foot of the Woulds, ſoutherly, to Hambleton Hill, in Tealby, near Market-Raiſin, the expence of which was eſtimated at 6,500l.

Calder and Hebble Navigation. Act Geo. III.—The general direction of this navigation is nearly weſt, about 23 miles in length, in the weſt riding of Yorkſhire; it has a conſiderable elevation above the ſea at its weſt end: the general objects are the communication between Liverpool, Mancheſter, and Hull, by means of the *Rochdale* and *Hudderſfield* canals, and *Ayre* and *Calder* rivers, the import and export of goods from Halifax, and the export of paving-ſtone (now ſo much uſed in London, called Yorkſhire paving) from the famous quarries at Ealand-Edge and Cromwell-Bottom, and lime from Houghton, Brotherton, and Fairburn: at Cooper's Bridge it is joined by Sir John *Ramſden*'s canal (leading to the *Hudderſfield* canal), and at Dewſbury by the *Dewſbury and Birſtal* rail-way. Halifax is the 58th Britiſh town, with a population of 8,886 perſons; Wakefield the 64th, with 8,131 inhabitants; and Hudderſfield the 81ſt, with 7,268 perſons. This navigation begins in the *Ayre and Calder* navigation on the latter river, at Wakefield, and terminates in the *Rochdale* canal, at Sowerby-Bridge. There is a rail-way branch of about half a mile to Bradley collieries; it has a cut of about half a mile in length by the ſide of the Hebble river, to Salter-Hebble; and proviſion is made (in 33 Geo. III. for *Barnſley*) for a cut to Bargh-mill, on a branch of *Barnſley* canal; there are ſeveral locks; one of them near Salter-Hebble, of 10 or 12 feet riſe, was in 1783 removed, and two new ones, of half that height, with a baſon between them, were ſubſtituted by Mr. *William Jeſſop*; ſome of the locks here erected in 1761, by Mr. *Smeaton*, have ſingle gates at their heads. At Salter-Hebble are a baſon and large warehouſes, and others at Sowerby Bridge, for the accommodation of the town of Halifax; near Ealand is a large weir acroſs the *Calder* river. This navigation was planned or ſuperintended by Mr. *James Brindley*, and afterwards by Mr. *John Smeaton*. About 1765, the navigation was brought up to Ealand quarries, and about 1776, to Salter-Hebble, and to Sowerby-Bridge warehouſes. The ſtone and white ſlate from Ealand-Edge are carried in carts and four-wheeled carriages, to be put on board of the keels at Bridgehouſe wharf, on account of the great height of the quarries above the *Calder*; the Cromwell bottom-ſtone is put on board at a wharf there. From the quarries of *Thomas Thornhill*, Eſq. at Lillon's Wood, near Ealand, a long and wide inclined plane, of about 45° of elevation, was, about the year 1774, made from the *Calder* river, and paved with large flat ſtones, on which a ſledge deſcended loaded with ſtone, and by means of a rope paſſing over a wheel and axle, drew another empty ſledge up the plane; this continued in uſe for ſome years; but this quarry was diſuſed before the year 1783. In 1762, a violent flood happened on the *Calder* river, which deſtroyed many of the works thereon; theſe Mr. *Smeaton* repaired, and in 1774 another happened, ſo deſtructive that the navigation was for near a year ſuſpended, before they were repaired; the fall of this river is no leſs than 8 feet per mile for more than 20 miles together. By the act 34 Geo. III. for *Hudderſfield* canal, this navigation was guaranteed againſt a diminution of its tolls, by any other communication to the eaſtward opened therewith. In 1794, the *Mancheſter Bolton and Bury* canal was propoſed to be extended to join this at Sowerby-Bridge. In 1802, the *Wibſey and Dewſbury* rail-way was propoſed to join at Raven's Bridge, and notices have in the preſent autumn (1805) been given for the *Wakefield and Hullet* rail-way, intended to join this navigation at Bottom-Boat, near Wakefield; a ſide-cut is now making near Bridge-houſe, for avoiding the mill-dams, and improving this navigation.

Cam River. The general direction of this navigation is about ſouth-weſt, for 14 or 15 miles in the county of Cambridge; it is but little elevated above the level of the ſea; its principal object is the ſupply of the town of Cambridge, which is the 51ſt in the order of our population, with 10,087 inhabitants: Ely alſo, near this navigation, is a conſiderable place. It commences in the great *Ouſe* river, at Harrimere, and terminates in the town of Cambridge. It has a cut or reach of 3 miles to Reche, and another of $3\frac{1}{2}$ miles to Burwell, at which laſt place the *Biſhopſtortford and Wilton* canal was, in 1789, propoſed to join. The *Cam* river is embanked above the adjoining fens through all its lower parts, is without locks in ſome parts, and has ſluices for making fluſhes of water, to enable boats to paſs the ſhallows and hards.

Camel River. The general direction of this navigation is about ſouth-eaſt for near 8 miles, in the county of Cornwall; it is within the flow of the tide, and is chiefly uſed in the import of coals and export of agricultural produce: it connects at Guinea-Port, near Wadebridge, with the *Polbrock* canal. Padſtow, on its banks, is a conſiderable town; it commences in the Iriſh channel, at Stepper Point, and terminates at Wadebridge.

*Canterbury and Nicholas-Bay.* In the year 1802, a canal was propoſed, and again in 1804, and ſurveys taken, for a canal on a level, capable of carrying ſea-built veſſels, between the ſea at St. Nicholas Bay, near Margate, to the city of Canterbury, about 10 or 11 miles in a ſouth-weſt direction, there to connect with the *Stour* river, and with a canal then propoſed, called the *Medway and Rother* canal. Canterbury has 9000 inhabitants, and is the 57th place in the order.

Cardiff and Merthyr-Tydvil Rail-way. Act about 35 Geo. III.—This line is nearly in a north-weſt direction, for $26\frac{3}{4}$ miles, in the county of Glamorgan, in South Wales. The general object of this rail-way is the export of iron from the great works at Merthyr Tydvil, Dowlais, &c. Cardiff, Caerphilly, and Merthyr are conſiderable towns on or near this line, which commences at the floating-dock, in the *Severn* at Lower Layer, the termination of the *Glamorganſhire* canal, by the ſide of which, very nearly, it proceeds to Merthyr Tydvil, and thence to the lime-works at Panton, in Merthyr pariſh; at Quaker's yard a branch of

9½ miles goes off to Carno mill, in Bedwellty; *Homfray, Hill* and Co. are the proprietors of this rail-way or tram-road, and it was, we believe, conſtructed under the firſt act of parliament ever paſſed for this kind of roads; the width of land allowed to be purchaſed was 7 yards. On the 21ſt Feb. 1804, a trial was made of one of Trevethic's high-preſſure ſteam-engines for drawing trams on this tram-road, as before mentioned, and 10 tons of iron and 70 perſons were drawn for 9 miles by the power of ſteam, without the uſe of condenſing-water. At Merthyr there is a curious and ſtupendous water-wheel, of 50 feet diameter, made of caſt-iron.

CARON RIVER. The direction of this river is weſt, in the county of Stirling, in Scotland, and for 3 miles it is navigable, from the *Forth* river to Caron ſhore, for veſſels drawing 7 or 8 feet water at neap-tides; at Caron ſhore there is a cut from the *Forth and Clyde* canal; and near Caron ſhore are the famous Caron iron-works.

CART RIVER. The direction of this navigation is nearly ſouth, for about 3 miles in Renfrewſhire, in Scotland; its objects being the ſupply, and the exports and imports of the great manufacturing town of Paiſley, which is the 15th in the order of Britiſh towns, and contains 31,179 perſons. Renfrew is alſo a conſiderable town near the ſame: this navigation commences in the *Clyde* river, near Inchinnan, and terminates at the town of Paiſley, at which place it was propoſed, in 1803, to be joined by the *Glaſgow and Saltcoats* canal.

CHELMER AND BLACKWATER NAVIGATION. Acts 6 and 33 Geo. III.—The general direction of this navigation is nearly weſt for 13⅝ miles in the county of Eſſex; its general objects are the ſupply of Chelmsford and its neighbourhood with coals, deals, &c. and the export of farm produce. It commences in the Tide-way, at Collier's-Reach, in the eſtuary of Blackwater river, and proceeds by the courſe of the Chelmer river to the baſon at Chelmsford town, with a cut near ¼ of a mile to Malden. Chelmsford and Malden are conſiderable towns. From low-water in the baſon at Collier's reach to Heybridge-mill, on Blackwater river, 1⅝ mile, is a riſe of 12 feet 8½ inches, thence to Beely or Baily-mill, on Chelmer river, 1⅛ mile, is a riſe of 7 feet 3½ inches; thence to the baſon at Chelmsford is 10⅞ miles, with a riſe of 59 feet 5 inches: the branch has a riſe 6 feet 8½ inches into the baſon at Malden. Mr. *John Smeaton* ſurveyed this line in 1762, and recommended 13 miles of new canal, and eſtimated the ſame at near 16,700 l.; Mr. *John Rennie* was afterwards employed. The baſon at Collier's reach was opened for ſhips in February 1796; the company were authorized to raiſe 60,000 l. the amount of ſhares 100 l. each; in 1802 theſe were ſo depreciated, that they were ſaid not to be worth 5 l. each. The ſpring-tides flow 5 feet at Baily-mill-tail, and 8 feet at Malden bridge; the neap tides do not raiſe the water above one foot at the laſt place.

*Cheltenham and Tewkſbury.* In 1801, notices were given for a propoſed canal from the *Severn* river, near the junction of the *Avon* therewith, at the town of Tewkſbury, to the town of Cheltenham, through the pariſhes of Tewkſbury, Tredington, Elmſtone-Hardwick, Uckington, Swindon, and Cheltenham, a courſe nearly ſouth-eaſt for about 8 miles, in the county of Glouceſter. Tewkſbury and Cheltenham are conſiderable places.

CHESTER CANAL. Acts 11 and 17 Geo. III.—The general direction of this canal is about ſouth-eaſt for 18 miles, in the county of Cheſter; it is not greatly elevated above the level of the ſea; its principal objects are the export of farming produce, and the import of coals and lime for Nantwich town, and the ſurrounding country; it forms a double communication between two points in the line of the *Elleſmere* canal, at Cheſter and at Franckton common. Cheſter is the 25th Britiſh town, with a population of 15,052 perſons. Nantwich is alſo a conſiderable town. This canal commences in the tide-way in the *Dee* river, in the town of Cheſter, near to where the *Elleſmere* canal croſſes the ſame, and terminates at the town of Nantwich; at Stoke, in the pariſh of Acton, it is joined by the Whitechurch branch of the *Elleſmere* canal; from Cheſter to Barbridge, near Tiverton, the diſtance is 14¾ miles, with a riſe of 170 feet 10 inches, and thence to Nantwich it is 3¼ miles, and level. The canal paſſes Chriſtleton, Waverton, Hargrave, Huxley, Braſſey-green, Beerton-caſtle, Tiverton, Hurleſton, Acton, and Nantwich; there is an aqueduct at Huxley-mill. Mr. *James Brindley*, and other engineers, were employed in 1767, 1769, and 1770; in 1769 an unſucceſsful attempt was made to obtain an act for it; it was begun in 1772, and was completed from the *Dee* to Huxley-mill 16th June 1775, and ſhortly after to Nantwich; a branch was provided for in the act, from Barbridge, 8⅝ miles long, with a fall of 40 feet, to Middlewich, near to the *Trent and Merſey* canal, but not into it. Although this branch, intended for bringing ſalt to Cheſter, was not executed, the expences amounted to 80,000 l. and the ſhares became perhaps the moſt depreciated of any concern in the kingdom, being ſold at one time, as we are informed, for one per cent. of their original value. In 1793, a junction was propoſed near Nantwich, with a branch of the intended *Sandbach* canal; in 1793, a rival ſcheme to the *Elleſmere*, called the Eaſtern Grand Trunk, was propoſed to join at Crows-neſt; and in June 1796 the *Commercial* canal was propoſed to join at the ſame place, in order to form by means of the *Aſhby-de-la-Zouch* canal, and others, a communication for 40 ton boats, between Liverpool, Cheſter, Hull, London, &c.

CHESTERFIELD CANAL. Act 10 Geo. III.—The general direction of this canal is nearly ſouth-weſt, by a crooked courſe 46 miles in length, in the counties of Nottingham, York, and Derby; the weſtern end is conſiderably elevated; its principal objects are the export of coals from near Cheſterfield, and lead from the Derbyſhire mines, and the import of lime, corn, timber, &c. Cheſterfield, Workſop, and Retford are conſiderable towns upon this line, which commences in the *Trent* river, near its junction with the *Idle* river, at Stockwith, and terminates at Cheſterfield town; from the *Trent* to Workſop the diſtance is 24 miles, with a riſe of 250 feet; thence to Norwood it is 9 miles, with a riſe of 85 feet; and thence to Cheſterfield it is 13 miles, with a fall of 45 feet: the number of locks is 65; the lower part of the canal, from the *Trent* to Retford, is for large boats of 50 or 60 tons burthen; above this the width is 26 to 28 feet, and depth of water from 4 to 5 feet; the boats here uſed being 70 feet long and 7 wide, and carrying 20 to 22 tons each. In 1794 ſuch boats as theſe coſt, when new, 90 to 100 l. each. The boat-owners here uſually pay their bargemen by the ton of goods which they convey ſtated diſtances, inſtead of weekly wages. At Norwood is a tunnel through Hartſhill of 2850 yards in length, being 12 feet high and 9¼ wide withinſide the arch, and 36 feet below the ſurface of the hill; this tunnel was begun in November 1771, and finiſhed the 9th May 1775; at Drake's-hole is another tunnel of 153 yards in length. Mr. *James Brindley* projected this canal, and directed its execution until his death in September 1772, when his brother-in-law, Mr. *Henſhall*, ſucceeded, and completed the whole in 1776. The tonnage is 1½d. per ton per mile, and in calculating the ſame ⅙th of a mile is taken into account, and ¼th of a ton. It appears that the canal coſt 160,000 l. and the ſhares were at firſt much depreciated, and ſold for a long time below par; in September laſt (1805) the profits amounted to 6l. per cent. annually. In Mr. *Brindley*'s time, a junction was intended at Cheſterfield with the propoſed *Cheſterfield and Swarkſtone* canal; and in 1802, an extenſion of this canal was propoſed of 5 or 6 miles in length, nearly ſouth to Aſhover.

*Cheſterfield and Swarkſtone.* The late Mr. *Brindley*, about the year 1771, propoſed a canal from the *Trent and Merſey* canal at Swarkſtone to the *Cheſterfield* canal at the latter place, the direct diſtance being about 25 miles nearly north, the line being through a country very rich in coals. Derby, the 43d town, with 10,832 inhabitants, was to be in the line of this canal, and the town of Belper is alſo near it.

Chicheſter Haven. This inlet of the ſea, on the coaſt of Hampſhire, is of conſiderable length, in different branches, navigable for ſhips, ſurrounding Thorney Iſle, and connecting with Langſtone and Portſmouth harbours. Havant and Chicheſter are conſiderable towns near it. In September 1805, notices were given for cutting a ſhort canal, to commence with a ſea-lock in deep water in this haven, and proceed to Upper Southgate field, in Chicheſter, there to terminate in a ſpacious baſon or dock.

Cleddy River. This river has nearly a north-eaſt courſe, in the county of Pembroke, in South Wales. It commences in the tide-way in *Milford Haven*, and terminates at Canniſter bridge, near Narberth, which is a conſiderable town; and Pembroke on another branch of the haven is alſo a conſiderable place.

Clyde River. Acts 34 Geo. II. and 9 and 11 of Geo. III.—This river or frith commences with a moſt noble and capacious eſtuary, in the northern or Iriſh channel, and extends nearly north, to Gonrook, when its direction changes towards the eaſt, and its width diminiſhes gradually to Glaſgow, where the navigation terminates. Glaſgow is the 5th town in Britain, in point of population, containing 77,385 inhabitants: Paiſley, in the vicinity of this river, is the 15th town, with 31,179 perſons; Greenock, the 20th, with 17,458 perſons; and Rothſay, (on the Iſle of Bute) the 118th, with 5,281 perſons: Ruther-Glen, Renfrew, Dumbarton, Port-Glaſgow, Irvine, and Ayr, are alſo conſiderable places on or near the banks of this river. At Glaſgow baſon a branch of the grand *Forth and Clyde* canal joins this, as alſo the *Monkland* canal, and *Edinburgh and Glaſgow* canal; near Inchinnan the *Cart* river joins, and at Dalmure Burnfoot; the weſtern termination of the *Forth and Clyde* canal is in this river; while the navigable lochs and ſounds which connect therewith below Dumbarton are both numerous and important; by means of lochs, Fine, and Gilp, there is a connection with the *Crinan* canal. In the year 1805 an act (45 Geo. III.) was obtained by the earl of *Eglinton* and others, for building new piers and improving *Ardroſſan* harbour, and building wet-docks, &c. near Saltcoats, on this river, and in this harbour, as well as at Glaſgow, the *Glaſgow and Saltcoats* canal was, in 1803, propoſed to connect therewith; at Rothſay, on the Iſle of Bute, piers have been built, and the harbour connecting with this river improved; *Greenock* harbour is alſo under great improvement, in conſequence of an act of 43 Geo. III. The trade on this river is very immenſe and various; it appears that Greenock alone employed 175,551 tons of ſhipping thereon in the year 1800.

Codbeck Brook. Act 7, Geo. III.—The direction of this navigation is nearly north for about ſix miles, in the north riding of Yorkſhire, commencing in the *Swale* river near Topcliff, and extending to the town of Thirſk, for whoſe accommodation it is intended.

Colne River. The general direction of this navigation is nearly N.W. for about 8 miles, in the county of Eſſex; its objects are the import of coals, deals, &c. and the export of farm produce, and of oyſters from the banks below Wivenhoe. Colcheſter is the 39th place in Britain, with a population of 11,520 perſons. It commences with an eſtuary at Merſey iſland, and terminates at the town of Colcheſter, to which place ſmall ſea-built veſſels can get up. Large ſhips navigate to Wivenhoe, where there is a dock-yard for building frigates and large trading ſhips.

St. Columb Canal. The general direction of this canal is nearly eaſt for ſeven or eight miles, in the county of Cornwall; although near the coaſt, it is conſiderably elevated. Its objects are the export of a particular ſpecies of ſtone found about St. Dennis, called China-ſtone, uſed in great quantities in Wedgewood's, and other potteries near the line of the *Trent and Merſey* canal, and the import of coals, and of a ſea-ſand conſiſting of broken ſhells for manure. This canal was propoſed to proceed acroſs the weſtern branch of the grand ridge to the ſouth coaſt; not one third of which length has, however, been carried into effect. St. Columb Major, St. Auſtel, and Grampound, are towns near the line. It commences at the ſea-ſhore of the Iriſh channel near St. Columb Minor, and terminates at preſent within about two miles of St. Columb Major; from thence it was to paſs St. Dennis, St. Stephen, St. Ewe, and arrive at the ſea again near Pentuan, not far from the famous Polgarth mines and engines. The part which was completed about the year 1775, commenced on the top of a very high cliff, and purſued the courſe above mentioned, without locks, we believe. The canal was a narrow one, and at its weſt end, the cliff was with great labour hewn down, into a ſteep inclined plane, that was covered with planks: the canal was conducted to the very top of this plane, and the boats which were rectangular ones, were brought, when loaded with ſtone, to the termination of the canal, where they were faſtened by a ſort of hinges; ſtrong ropes were then attached to the ſtern of the boat, and by means of a wheel and drum, worked by a horſe-gin or wem; the boat was hauled up an end, and the ſtones were thereby ſhot out, and rolled down the plane to the ſtrand below, from whence boats conveyed them on board the ſhips. The ſame wheel and drum was adopted for drawing boxes of coals or Shelly ſand up the plane, in order to their being loaded into the returning boats. Near to its eaſtern termination the canal was conveyed on an aqueduct bridge over a road. We have been favoured with theſe particulars by a Corniſh gentleman, ſince our account of inclined planes was written, or we ſhould have noticed this (the plane on *Parnel*'s canal and another on the *Calder and Hebble*) as early inſtances of the uſe of inclined planes for boxes of goods, &c. For ſeven or eight years this canal continued in uſe, but whether like the *Mawgan* canal, in its neighbourhood, it has ſince been diſuſed, we are not at the preſent moment able to learn.

*Commercial Canal.* In the year 1796, Mr. *Robert Whitworth* was employed to ſurvey this line, proceeding from the *Cheſter* canal at Nantwich to the *Aſhby de la-Zouch* canal near that town; it was propoſed to join Sir *Nigel Griſley's* canal and the *Newcaſtle under-line* canal, to croſs the *Trent and Merſey* canal near Burſlem, and proceeding by Uttoxeter, to croſs the *Trent and Merſey* canal again, and the *Trent* river at Burton. The objects of this propoſed canal were, the forming of a communication for larger boats (40 tons) than the *Trent and Merſey* is calculated for, except below Burton, and contributing towards the wiſhed-for paſſage of large boats between Liverpool, Mancheſter, Cheſter, Hull, London, &c.

Conway River. This river has nearly a ſouth courſe for

14 or 15 miles, between the counties of Caernarvon and Denbigh in North Wales; its principal object ſeems to be the ſupply of Llanrwſt and Aberconwy, which are conſiderable towns. It commences at the tide-way in Conway bay, and terminates at Llanrwſt town. In June 1802, it was in contemplation to ſtraighten the courſe of this river, about a mile below Llanrwſt, by a new cut 492 feet long, 88 feet broad at top, and 60 at bottom, with a dam at its upper end acroſs the old crooked channel. At Llanrwſt, there is a curious ſtone bridge of three arches, built by *Inigo Jones*, over this river; and in 1802, it was propoſed to conſtruct a ſtupendous caſt iron bridge over it at Aberconway ferry, in order to facilitate the communication with Ireland by way of Holyhead, in the Iſle of Angleſea; another iron bridge being intended at Bangor ferry, on *Menai* ſtrait.

Coombe-Hill Canal. Act 32 Geo. III.—The courſe of this canal is nearly S. E. for $3\frac{1}{2}$ miles, in the county of Glouceſter: its general objects are the export of coals from the mines near it, and ſhortening of the length of land carriage to Cheltenham, which is a conſiderable town; and ſo is Tewkſbury near its weſtern end. It commences in the *Severn* river at Fletcher's leap in Dearhurſt, and terminates at Combe hill in the pariſh of Leigh, the riſe being 15 feet only. This canal was conſtructed at the ſole expence of three perſons, viz. *Thomas Burges*, *William Miller*, and *Sarah Mumford*.

*Cottingham and Hull.* In the year 1802, this line of canal was propoſed, about four or five miles in length, in a N.W. direction, in the eaſt riding of Yorkſhire, to commence in the *Humber* river at the town of Hull, and extend to the town of Cottingham. The import of coals, deals, &c. and the export of farm produce, and perhaps of chalk, ſeem to be its principal objects. Hull is the 16th town in Britain, with a population of 29,516 perſons.

Coventry Canal. Acts 8, 25, (for *Trent and Merſey*) and 26 of Geo. III.—The general direction of this canal is nearly S.E. for about 22 miles (excluſive of the detached part beyond the *Birmingham and Fazely* canal, and the branch to Coventry) in Staffordſhire and Warwickſhire. Its ſituation is high, particularly the eaſtern part, which croſſes the grand ridge near Bedworth, without a tunnel, and its Seeſwood branch does the ſame. Its general objects are the line of communication between London, Birmingham, Mancheſter, Liverpool, &c. the export of coals from the numerous mines near it, and the ſupply of Coventry city, which is the 24th on the liſt of Britiſh population, with 16,034 inhabitants. Nuneaton, Atherſtone, and Tamworth, are alſo conſiderable towns near the line; and Hinckley, the 120th, with 5,070 inhabitants, is alſo in its vicinity. It commences in the *Birmingham and Fazely* canal at Fazely, and terminates in the *Oxford* canal at Longford; its detached part of $5\frac{1}{2}$ miles in length, commences at the termination of the *Birmingham and Fazely* canal at Whittington brook, and terminates in the *Trent and Merſey* canal at Fradley heath; near to Whittington brook, it connects with the *Wyrley and Eſſington* canal, and at Marſton bridge the line is joined by the *Aſhby-de-la-Zouch* canal. There is a cut of about one mile in length to Griff collieries, belonging to ſir Roger Newdigate; another to ſeveral collieries by different branches near Seeſwood-pool and Bedworth, five or ſix miles in length; there is alſo a cut of half-a-mile from the line to Bedworth; the branch to Coventry is $4\frac{3}{4}$ miles in length, and there is a rail-way branch to Oldbury coal works. The detached part is level with the *Trent and Merſey* canal, which level continues (through $5\frac{1}{2}$ miles of the *Birmingham and Fazely*) to the commencement of the line of this canal at Fazely; from thence to Atherſtone, a diſtance of about 10 miles, the riſe is 96 feet, by means of 13 locks; from thence to the *Oxford* canal, about 12 miles, is level; ſo is the cut to Coventry, and thoſe to Griff, Seeſwood-pool, Bedworth, &c. The laſt or higheſt level of this canal forms, with part of the *Oxford* and *Aſhby* canals, the longeſt level that is to be found in Britain, being upwards of 82 miles, we believe, including ſide branches. This is a narrow canal, but the company have bound themſelves to widen the ſame to the width of the *Grand Junction*, if the proprietors of that canal ſhall at any future time require it. A ſtop-gate is maintained at the end of the *Oxford* canal at Longford, to prevent this canal, which is ſometimes low in Summer, from drawing off their water. Mr. *James Brindley* was the original engineer to this concern, and $16\frac{3}{4}$ miles of the level part from Coventry to Atherſtone was completed in 1786, when the works were ſuſpended for near 10 years; at length, the *Trent and Merſey* company undertook to complete 11 miles of this original line north of Fazely; half of which they afterwards ſold to the *Birmingham and Fazely* company; and the other half, on the 4th of February, 1787, was purchaſed by this company, who thus came to have a detached part of their canal. The line of communication was opened by the completion of this canal in June 1790. This company have been authoriſed to raiſe 120,000l., their ſhares being 100l. each. Some years after the completion of this and the *Oxford* canal, the ſhares herein had obtained the great price of 400l., but owing to the rivalry of the *Warwick and Napton* canal, they were, in 1802, reduced to 350l., and their dividend to 8l. per cent. Since the completion of the *Grand Junction*, this concern has been flouriſhing, and the dividends are now 16l. per annum per ſhare. The tonnage allowed on this canal is $\frac{1}{2}$d. per ton per mile for lime and lime-ſtone, and $1\frac{1}{2}$d. per ton per mile for all other articles, (except road or paving materials and manures upon the pounds, or when the water runs to waſte at the locks.) On the completion of the adjoining canals, the tonnage on coals was, by their general conſent, reduced to 1d per ton per mile upon ſeveral of them. It was agreed, between this and the *Oxford* company, (9 Geo. III. *Oxford*) that the latter ſhould be entitled to all tolls, except on coals, that are collected on the firſt $3\frac{1}{2}$ miles of this canal towards Coventry, for goods paſſing from the *Oxford* canal, and that this company ſhould in return receive the tolls upon coals collected on the firſt 2 miles of that canal. The act of 34 Geo. III. for *Aſhby-de-la-Zouch* canal, granted to this company 5d. per ton upon all goods (except farming produce, manures, or road materials, or iron or its ore, made or dug on the banks of the *Aſhby* canal) navigated thereon, which ſhall, either before or after, paſs on any part of this canal, or the *Oxford* or *Grand Junction*; and a farther ſum per ton, equal to the tonnage hereon between Griff and Longford, on all goods which may paſs any new communication that may hereafter be opened between the *Aſhby* canal and the *Oxford* or *Grand-Junction*; for enforcing which, this company is empowered to erect toll-houſes and ſtop-bars, and place collectors on any part of the *Aſhby* canal.

Cree River. The courſe of this river is nearly north, for 9 or 10 miles of a crooked courſe, between the counties of Wigton and Kirkcudbright in Scotland; its object is the ſupply of the adjoining country, and of Wigton, which is a conſiderable town. It commences in the tide-way in Wigton bay in the Iriſh or Northern Channel, and terminates at Newton Douglas.

Crinan Canal. Acts 33, 39, and 45 of Geo. III.—The courſe of this very wide and deep canal is nearly weſt for about nine miles, in the county of Argyle in Scotland; its ſole object is the ſhortening of the paſſage for ſhips between the Iriſh Sea and the *Clyde* river (by means of the loch of Fine), by avoiding the voyage round the peninſula of Kintire. It commences at loch Gilp, and terminates in lock Crinan. The riſe is 58 feet, and the fall 59 feet, a rivulet near the point of diviſion ſerving as its feeder. The water in this canal is 12 to 15 feet deep. This line of canal was firſt ſurveyed for ſmaller veſſels by Mr. *Watt*, after which Mr. *John Rennie* was employed herein; it appears to have been opened ſome time, but farther improvements, and the building of a pier in Loch Gilp are yet in hand. The proprietors have been authoriſed to raiſe 180,000l., and they have alſo received 50,000l. of the public money, which parliament granted in aid of this great and important work. The ſhares are 50l. each. A veſſel under ſail, not being ſtopped in proper time, before ſhe arrived at a lock on this canal, bore the ſame away, and went down therewith into the next pound. A paſſage may, it is ſaid, be made by means of this canal in three or four days, which frequently took up three weeks. In 1802 the ſhares herein were 22l. below par.

Cromford Canal. Act Geo. III.—The general direction of this canal is about N.W. for 18 miles, in the counties of Nottingham and Derby; it is conſiderably elevated: its general objects are the export of coals and of lead, iron, lime-ſtone, and other minerals from the mines of Derbyſhire. Wirkſworth and Belper are conſiderable towns near its courſe. It commences in the *Erewaſh* canal at Langley bridge (not far from the junction of *Nottingham* canal therewith), and terminates in the town of Cromford near Matlock. There is a cut to Pinxton coal works of three miles in length, another to Swanwick coal works; alſo a rail-way branches to Critch lime-works, $1\frac{1}{2}$ mile, and to Biggarlee coal works $1\frac{1}{2}$ mile. From the *Erewaſh* canal to near Codnor caſtle, four miles, there is a riſe of 80 feet, thence to Cromford, 14 miles, it is level; the Pinxton branch is level, and proceeds from the upper level. The width of this canal at top is 26 feet; the boats are 80 feet long, $7\frac{1}{6}$ feet wide, and $3\frac{1}{3}$ feet deep; when empty they draw 8 or 9 inches of water, and when loaded with 22 tons, they draw about $2\frac{1}{2}$ feet. Near Ripley is a tunnel of 2966 yards in length, which is 9 feet wide withinſide at the water's ſurface, and 8 feet high from thence to the crown of the arch, which is of brick, except ſome parts where the rock proved hard and ſound enough to ſtand without walling: the ſide-walls and crown of this arch ſeem to be part of an ellipſis, but where an inverted or bottom arch was wanted, the ſame is much flatter. For conſtructing this tunnel, 33 pits or tunnel-ſhafts were ſunk, ſome of them on the ſummit of the hill, being 57 yards deep. This tunnel is ſaid to have coſt 7l. per yard in length: it interſects a valuable ſeam of coals, which is now worked, and in ſinking the tunnel-pits excellent iron ore was found, which is now worked, and the furnaces are ſupplied with coals drawn up through a ſhaft from below for that purpoſe. There are ſeveral ſmaller tunnels upon the line for ſhortening its courſe. Near Butterly hall there is a conſiderable deep-cutting, and ſhorter ones in other places, to avoid the loops round the points of the hills. Over the Derwent river, near Wigwell, there is a large aqueduct bridge 200 yards long and 30 feet high, the river arch is 80 feet ſpan. Two ſmaller arches by its ſide ſerve to carry off floods, and for a road. Over a ſmall river, which comes into the Derwent near Frithly, is another large aqueduct bridge about 200 yards long and 50 feet high; beſides the river arch, there are two others, one for floods, and another conveys the turn-pike road under the canal; theſe two aqueducts are ſaid to have coſt about 6000l. There are conſiderable embankments in ſome places on this canal. Nearly over the Ripley tunnel there is a reſervoir of 50 acres of water when full, the head or embankment of which is 20 yards long, 33 feet in height in the middle of the valley, the baſe being there 52 yards wide, the top of the bank is four yards wide. This reſervoir is ſaid to have coſt 1600l.; the mean depth of it is 12 feet, and it will contain about 2[illegible] locks full of water, which is let out by a large pipe and cock in one of the tunnel-pits. There are two other reſervoirs for this canal, one of 20, the other of 15 acres. At the Cromford end of the canal there is a conſiderable ſtream of water taken in as a feeder, and the whole of the 14 miles of level and branches thereto have their banks made up one foot higher than uſual to act as a reſerve for dry weather. Mr. *William Jeſſop* was the engineer to this canal, and it was completed before the year 1794. The total coſt is ſaid to have exceeded 80,000l. For the cutting and wheeling of clay, $3\frac{1}{2}$d. per cubic yard, per ſtage of 20 yards, was uſually paid; for gravel $4\frac{1}{2}$d. per yard; for ſtony ground $4\frac{1}{2}$d. per yard, and 4d. per cubic yard extra for all ſtones picked out and ſtacked. In the year 1797, a cut was propoſed from the ſummit-level to the new collieries in Codnor park. In 1801, notices were given for the intended *Belper* canal, that was propoſed to join this near to Bull bridge; and in 1802, a cut was propoſed to be made from the Derwent aqueduct on this canal to near Dethick, and thence near the Derwent and Wye rivers to the town of Bakewell.

Crouch River. The courſe of this river is nearly weſt, in the county of Eſſex. The principal objects of this navigation are the import of coals, deals, &c. and the export of farm produce, and of oyſters from near Walfleet. Billerica and Rochford are the neareſt conſiderable towns to this river. It commences in the Engliſh channel (about 10 miles from the mouth of the *Thames*), and terminates at Hull bridge.

Croydon Canal. Act 41 Geo. III.—The general direction of this canal is nearly ſouth for $9\frac{1}{2}$ miles, in the counties of Kent and Surrey: it is not greatly elevated; its objects are the ſupply of Croydon with coals, deals, &c. and the country through which it paſſes with manures and other articles, and the conveyance of its produce to the London markets, and the export of fire-ſtone, flint, and fullers' earth. Croydon is the 108th Britiſh town, with a population of 5,743 perſons. Deptford is alſo a conſiderable place. This canal commences in the *Grand Surry* canal near Deptford (two miles from its connection with the *Thames* at Rotherhithe), and terminates at the new Baſon near the town of Croydon. From the *Grand Surry* canal (level with an ordinary high tide in the *Thames*) to the top of Plowgarlic hill, $1\frac{1}{4}$ mile, is a riſe of 70 feet, by 12 locks; thence for $\frac{1}{2}$ a mile it is level, and thence for $\frac{3}{4}$ of a mile to the beginning of Foreſt wood, there is a riſe of $79\frac{1}{2}$ feet, by 13 ſingle and one double locks; from thence to Croydon, 7 miles, it is level. The locks upon this canal are 60 feet long and 9 feet wide; each lock has a groove for ſtop-planks at its head, but no paddle-weirs; the waſte water is intended to run over the upper gates. This company are to have a baſon for their boats to lie in at Rotherhithe, on the ſouth-eaſt ſide of the *Grand Surry* entrance baſon, and another by the high road near Croydon town. There are ſeven road bridges and 30 accommodation ſwing-bridges. On the top and northern ſlope of Plowgarlick hill, there is a conſiderable deep-cutting, and others in Sydenham and on Penge common; and near Selhurſt wood is a conſiderable embankment. On Sydenham common there is a reſervoir of 10 or 15 acres ſupplied in wet times by a feeder out of an adjoining vale, and into which its waſte or over-fall is to be when full; there is another reſervoir on Norwood common, which, with the long ſummit-pound on ſo tenacious a ſoil, will be ſufficient, it is preſumed, to ſupply the locks that are making. At the time the act paſſed for this canal, it ſeemed intended to uſe inclined planes, and to pump the water for ſupplying the pounds up from the *Grand Surry* canal by ſteam-engines, that were alſo intended to wind the boats up the planes: and it ſeems ſingular, under theſe circumſtances, that legiſlative proviſion was made, for a culvert or ſmall tunnel through Foreſt-hill for conveying water from the ſummit-level of this canal on Sydenham common, and by aqueducts or pipes to ſupply ſeveral towns and places with water, viz. by a branch of near $\frac{3}{4}$ of a mile to the top of Dulwich town, and from the end of the ſaid tunnel to Knight's hill by a crooked courſe of three miles in length through Norwood, and along Knight's hill towards London for one mile; alſo another branch of near one mile to Streatham town. Mr. *John Rennie* and Mr. *Ralph Dodd* were the engineers, and Mr. *Clark* is now employed as reſident engineer thereon. About ſeven miles of the upper end of this canal is completed and in uſe, and the remainder is proceeding with great expedition. The company are empowered to raiſe 80,000l., which is not now expected to prove ſufficient; the amount of ſhares are 100l. each. The ſum of 40l. is to be paid annually to the city of London, towards improving the Thames river above London Bridge. This canal is to have its water kept always two feet above the ſurface of the ground on Croydon common, and ſome other ſevere and unprecedented reſtrictions are introduced in favour of the millers on the Wandle river, at ſome miles diſtance.

*Croydon and Wandſworth.* In September 1800, propoſals were made for a canal from the river *Thames* at Wandſworth, following nearly the courſe of the Wandle river to Croydon in Surry; but the ſame was given up ſhortly after, in favour of the north *Surry iron rail-way*, which paſſes through nearly the ſame tract.

CYFARTHFA CANAL. The general direction of this canal, or *water level*, is nearly N.W. we believe, for about 3 miles, in the county of Brecknock; it is on a high level, and was conſtructed ſome years ago by Mr. *Bacon*, to bring coals and iron-ore from the mines in the mountains, to his furnaces at Cyfarthfa, near Merthyr Tidvil. The whole is upon one level, and it does not connect with any other canal or navigation; it is now the property of Mr. *Crawſhaw*, the great iron maſter. It is ſituate near to the northern ends of the *Glamorganſhire* canal and the *Cardiff and Merthyr* rail-way.

DARENT RIVER. The courſe of this river (called Dartford creek,) is ſouth for near 3 miles in the county of Kent; it commences in the tide-way in the river *Thames*, and terminates near the town of Dartford, for whoſe ſupply it is principally uſed.

DART RIVER. The general direction of this river is nearly N.W. for about 10 miles, in Devonſhire; the tide flows through its whole length; its principal objects ſeem to be the ſupply of Totneſs with coals, and the country with ſhell-ſand manure, and the export of farming produce. Dartmouth and Totneſs are conſiderable towns; its commencement is in Start bay, and it terminates at the Mill weir, about one mile above Totneſs; this river is plentifully ſtored with trout.

*Dean-Foreſt Rail-way.* In the year 1802, it was propoſed to conſtruct a rail-way from the river *Wye*, near to Engliſh Bichnor, we believe, to the ſummit of the Foreſt of Dean, its object being the carriage of the immenſe ſtores of coal and iron, with which it abounds; Colford is a conſiderable town near its route. In the preceding year the *Severn and Wye* rail-way was propoſed to paſs nearly the ſame track.

DEAN RIVER. Act 12 Geo. III.—The direction of this river is nearly S. for about 2 miles, in the county of Nottingham; it is not greatly elevated above the level of the ſea; its principal object is the ſupply of Newark, the 91ſt town in the liſt of Britiſh population, with 6730 inhabitants. It commences in the river *Trent*, at Crankley's, in South Markham, and terminates at the upper weir near the town of Newark; the works hereon were completed in Jan. 1797. In 1793 the *Newark and Bottesford* was propoſed to join this at Newark.

DEARNE AND DOVE CANAL. Acts 33 and 40 Geo. III. —The general direction of this canal is about N.W. for $9\frac{1}{4}$ miles, in the Weſt Riding of Yorkſhire, its northern end is conſiderably elevated; its objects are the communication between Sheffield, Wakefield, Halifax, Leeds, Mancheſter, Liverpool, &c. and the export of the coals and iron-ſtone, &c. ſo plentifully found on its courſe. Barnſley and Rotherham are conſiderable towns on or near it, ſo is Doncaſter, the 110th town, with 5697 inhabitants. It commences in a ſide cut of the *Don*, or Dun river, between Swinton and Mexburgh, and terminates in the *Barnſley* canal at Eyming's wood, near Barnſley, there is a branch of $3\frac{1}{8}$ miles to Rockcliff bridge, and another of $1\frac{3}{4}$ miles to Cobcar Ing. From the cut of the *Don* navigation to Knoll Brook the diſtance is $4\frac{1}{4}$ miles, with a riſe of $41\frac{1}{4}$ feet; thence to Aldham Mill, $2\frac{1}{8}$ miles, is a riſe of 24 feet, (the Cobcar Ing branch being on its higheſt level); thence to the *Barnſley* canal is $2\frac{7}{5}$ miles, with a riſe of $59\frac{2}{3}$ feet; the Cobcar Ing branch is level; the Rockcliff branch begins from the ſummit-level, and $1\frac{1}{2}$ mile to Worſborough bridge is level; thence to Rockcliff bridge, $1\frac{5}{8}$ mile, it has a riſe of 56 feet. The locks on this canal are built with excellent hewn or aſhler ſtone, and are calculated for boats of 50 or 60 tons burthen, the ſame as navigate the *Dun* river, and this company are required to keep a depth of water equal to $4\frac{1}{2}$ feet on their lock-ſills, and in every part of their line; and for guarding againſt loſs of water on the ſummit, a ſtop-gate is to be erected hereon, near the termination in the *Barnſley* canal, and another on that canal below the junction, both of which may be ſhut and locked when the ſupply of either canal fails, and it would conſume the water of the other. The aqueduct and other bridges hereon are ſubſtantially conſtructed of hewn ſtone. Tumbling-bays and gauge-weirs are to be erected for ſupplying ſeveral mills. There is a large reſervoir near Elſicar. Proprietors of mines may make rail-ways to this canal, if within 1000 yards, or 2000 yards near Wath. Mr. *John Thompſon* is ſaid to have been the engineer, and it was completed in the year 1804. The company were empowered to raiſe 100,000l. The amount of ſhares 100l. each. The rates of tonnage on this canal are too various and complicate for the room we can allot to this ſubject, they will be found in *Phillips' 4to. Hiſtory*, p. 62 to 66; but it muſt be obſerved, that the laſt act (40 Geo. III.) made an increaſe of, we believe, 50 per cent. on theſe tolls. Boats are to pay for 6 miles of tonnage, however ſhort a diſtance they may have navigated on this canal. In May 1797, earl Fitzwilliam propoſed, at his own expence, to extend the Cobcar Ing branch to his Elſicar collieries, on being allowed water for the ſame from the Elſicar reſervoir.

DEBEN RIVER. The courſe of this river is nearly N.W. for about 10 miles, in the county of Suffolk; its objects are the imports of coals, deals, &c. and exports of farm produce; it commences at the ſea near Felixtow, and terminates near Woodbridge, which is a conſiderable town.

DEE RIVER, (*Aberdeen*). This river takes its courſe about weſt for 2 miles, between Aberdeenſhire and Mearns county in Scotland, the tide flowing through the whole navigable length; it commences in the harbour of new Aberdeen, where it is joined by the *Aberdeenſhire* canal. New Aberdeen is the 19th town in Britain, with 17,597 inhabitants, and its harbour was improved by a pier of 300 yards in length, begun under the direction of Mr. *John Smeaton*, in 1770, who was employed again in 1778, to make farther improvements. In 1801, Mr. *Thomas Telford* was employed to deſign new works and improvements hereon, ſo that ſhips of 18 or 20 feet draught of water may be accommodated. There are excellent granite quarries near this river.

Dee River, (*Cheſter*). The general courſe of this river is nearly S.E. for about 22 miles, in the county of Flint, and ſkirting the county of Cheſter: the firſt 9 miles are by a wide eſtuary opening to the Iriſh channel, and from near the town of Flint thereon, a new cut was made for the river up to Cheſter, under the direction of Mr. *Nathaniel Kinderley*, about the year 1749; before which time the old channel was ſo choaked with ſand, that ſhips of burthen could not come within 7 or 8 miles of Cheſter; the new ſtraight cut, that was at firſt 8 feet deep in general, principally through marſhes, ſoon ſcoured itſelf out, ſo that ſhips of 200 tons could come up to the town, and where the time of high-water became earlier by $\frac{3}{4}$ of an hour, than when the tide had to make its way through the old crooked and ſhallow channel. Cheſter is the 25th town, with 15,052 inhabitants, Holywell near it, is the 111th, with 5,567 perſons, and Flint is alſo a conſiderable town. On the N.W. ſide of Cheſter the *Elleſmere* canal connects with this navigation and croſſes it, for which goods pay 2d. per ton to this company; it is alſo to receive from the *Elleſmere* company whatever its tolls may fall ſhort of 210l. annually. At Cheſter this river is joined by the *Cheſter* canal.

Dee River, (*Kirkcudbright*). The courſe of this river is nearly N. for about 6 miles, in the county of Kirkcudbright in Scotland, being an eſtuary opening to the Iriſh ſea. Kirkcudbright is a conſiderable town thereon, and where the *Glenkens* canal connects therewith.

Derby Canal. Act 33 Geo. III.—This canal runs nearly N. for about 9 miles, in the county of Derby; it is not greatly elevated above the level of the ſea. Its objects are, the ſupply of the town of Derby, and the export of coals and iron. Derby is the 43d Britiſh town, with a population of 10,832 perſons. It commences in the *Trent* river at Swarkſtone bridge, croſſes and interſects with the *Trent and Merſey* canal, and terminates at Little Eaton, near 4 miles above Derby, from which town a cut of $8\frac{1}{2}$ miles goes off to a place between Sandiacre and Long Eaton, and there joins the *Erewaſh* canal. There is a *rail-way* branch of $4\frac{1}{2}$ miles, to Smithey-houſes near Derby, another to Horſley collieries, and another of $1\frac{3}{4}$ mile to Smalley mills. In caſe a rail-way, or canal, ſhould be hereafter made S. of the *Trent* from Bredon lime-works, this company has engaged to make a cut between the *Trent and Merſey* canal and the *Trent*, at Weſton cliff, oppoſite thereto. From the *Trent* to the *Trent and Merſey*, $\frac{1}{2}$ a mile, is a riſe of — feet; thence to Derby, $5\frac{1}{4}$ miles, is a riſe of 12 feet; and thence to Little Eaton, $3\frac{1}{4}$ miles, is a riſe of 17 feet; the *Erewaſh* branch has a fall of 29 feet. This canal is 44 feet wide at top, 24 at bottom, and 5 feet deep, except the upper level next Little Eaton, which is made 6 feet deep to retain the water of wet ſeaſons like a reſervoir; the locks are 90 feet long, and 15 feet wide within ſide: adjoining the town of Derby is a prodigious large weir or tumbling bay, where the canal croſſes the *Derwent* river, that was navigable to this place for many years back, but the tolls thereof were expected to fall off on the completion of this canal, and it was therefore agreed, that this company ſhould purchaſe the whole concern for 3996l. A little W. of the river above-mentioned, the canal croſſes a brook in a *caſt iron* trough or aqueduct. This canal was finiſhed in 1794; the company were authorized to borrow 90,000l. the value of ſhares being 100l. Separate rates of tonnage were fixed on different goods, between the *Trent* and the *Trent and Merſey*, between that and Derby, and on the different cuts and rail-way branches, which are too long for us to inſert, they will be found in *Phillips' 4to. Hiſtory of Canals, Appendix*, p. 55 to 59. Manures are to paſs toll-free, and puncheons or clogs of wood, to be uſed as ſupports in the adjacent coal-mines, alſo road materials, except for turnpike-roads; and if the Mansfield turnpike-road tolls are reduced below 4 per cent. on their debt, this company is to make them up to that ſum. The profits of this concern are not to exceed 8 per cent. but after 4000l. is accumulated as a ſtock for contingencies, the tolls are to be reduced. Five thouſand tons of coals annually are to paſs hereon toll-free, for the ſupply of the poor of the town of Derby. Horſes pay 1d. and cattle $\frac{1}{2}$d. each, for liberty of paſſing along each rail-way branch.

Derwent River, (*Derby*). The courſe of this river is nearly N.W. for about 9 or 10 miles, in the county of Derby; its principal object was the ſupply of Derby, previous to the making of the *Derby* canal, when this concern was ſold to that company, as mentioned above. It commenced in the *Trent* river at Wilden-ferry, (where the *Trent and Merſey* canal commences,) and terminated at the town of Derby.

Derwent River, (*New Malton*). The general courſe of this river is nearly N. for about 37 miles, in the Eaſt Riding of Yorkſhire; its objects are the ſupply of New Malton (a conſiderable town) with coals, deals, &c. and the export of farm produce, chalk, &c. It is but little elevated above the ſea; it commences in the *Ouſe* river at Barnby, and terminates at the town of New Malton. In January 1804, it was in contemplation to make this river navigable up to Yedingham bridge.

Derwent River, (*Workington*). The courſe of this river is nearly E. in Cumberland. Workington, on its banks, near the Iriſh ſea, is the 109th Britiſh town, with 5,716 inhabitants; to the vicinity of this town there are ſeveral *rail-ways*, which bring down coals from Mr. *Curwen's*, and other coal-mines, for exportation from this place.

Devon River. The general direction of this river is nearly N.E. in Clackmannanſhire in Scotland, from near Cambus quay, on the Frith of *Forth*, (two and a half miles above Alloa) to Medlockfoot. Mr. *John Smeaton* was, in 1765, and again in 1768, conſulted, about making this river navigable, or a canal by its ſide, the riſe being $38\frac{1}{2}$ feet, in order to bring down the produce of ſeveral coal-mines near its banks, to be ſhipped on the *Forth*, wherein the ſpring tides riſe 20 feet at Cambus quay. A branch was propoſed to Alloa, and another to Sterling.

Dewsbury and Birstal Rail-way. The general direction of this rail-way is nearly N. for about 3 miles, in the Weſt Riding of Yorkſhire, and its object is to bring down coals to the veſſels in the *Calder* river; it commences in the *Calder and Hebble* navigation at Dewſbury, and terminates at Stubley coal-mines in Birſtal pariſh, which are worked by Meſſrs. *Thomas Cheſter* and Sons, who are alſo the ſole proprietors of this iron rail-way, which was completed in the preſent month (October 1805).

Don, (*or Dun*) River. Act 12 Geo. II. The general direction of this river is nearly S.W. for near 40 miles in the Weſt Riding of Yorkſhire, (including what is, in ſome maps, called the Dutch river, near to the *Ouſe*,) the ſouthern end of this navigation is rather elevated. The original objects of this navigation were principally the ſupply of Sheffield, and the export of the iron-wares and iron from Sheffield, Rotherham, &c. ſince which period, the *Dearne and Dove* canal, which joins at Swinton, and the *Stainforth and Keadby*, at Fiſhlake and at Hangman Hill, and the cut to the *Ayre* river near Snaith, have opened new ſources of ſupply, and for the export of coals, ſtones, iron, and manufactured goods of ſeveral kinds, which this rich track of country produces. Sheffield is the 14th Britiſh town, with 31,314 inhabitants, Doncaſter is the 110th with 5697 perſons; Rotheram, Doncaſter, Thorne, and Snaith are alſo conſiderable towns on or near this navigation. The commencement is in the *Ouſe* river, at Goole bridge, and it terminates at Attercliffe, within 2 miles of Sheffield, and has a cut to the *Ayre*, as above, and ſide-cuts with locks between Mexburgh and Swinton, and in other places; the tide flows above the junction of the river Went. The *Stainforth and Keadby*, act 33 *Geo.* III. has directed rates for boats paſſing out of this into that canal by the cut of this river. In September 1803, notices were given, for a new act for weirs and ſide-cuts to this river in Mexborough, Spotborough, and other places, and a new courſe for the river, near the junction of Dearne river. And, in February 1803, there was a deſign of extending this navigation to Sheffield by a canal from Tinſley, 4 miles, for which 30,000l. was ſubſcribed.

DONNINGTON-WOOD CANAL. The general direction of this canal is about N. or N.E. for 7 miles in Shropſhire; it is upon a very high level, nearly parallel to the grand-ridge on the weſtern ſide: its object is the conveyance of iron-ſtone and lime-ſtone, from the mines to the Donnington-wood iron works in Lileſhal pariſh, and lime and coals for the ſupply of the town of Newport, which is a conſiderable place. It commences in the *Shropſhire* canal (near its junction with *Shrewſbury* canal,) at Donnington wood, and terminates at Pave-lane wharf near Newport; it has a level branch to Lileſhal lime-works, but on a higher level than the line, to which the lime-ſtone was formerly let down, in boxes through perpendicular ſhafts, at the ſame time that other empty boxes were aſcending, the conſtruction being nearly the ſame as the ſhafts afterwards uſed at Brierly-hill on the *Shropſhire* canal, but like them they have ſince been diſuſed and inclined planes are now uſed, on which boxes of lime-ſtone deſcend and draw up empty boxes by means of ropes paſſing over a large drum, to which a brake-wheel is adapted to regulate the motion. The boats hereon carry 25 tons of lading: the canal was cut in 1778 at the joint expence of the marquis of *Stafford* and Meſſrs. John and Thomas Gilberts. In June 1797 this was propoſed to be joined at Pave-lane by the *Newport and Stone* canal.

DORSET AND SOMERSET CANAL. Acts 36 and 43 Geo. III.—The general direction of this canal is nearly S. for about 40 miles in the counties of Wilts, Somerſet, and Dorſet: the middle part of it is on a high level, and croſſes the ſouth weſtern branch of the grand ridge. Its principal objects are the ſupply of the manufacturing towns and neighbourhood through which it paſſes, with coals from the mines bordering on Mendip, and the opening of an inland communication between the Briſtol channel, the *Severn*, the *Thames*, and the ſouthern coaſt of the iſland. Froome is the 60th town in the order of population, with 8,748 inhabitants, and Bradford, the 78th, with 7,302 perſons; Bruton, Wincanton, Stalbridge, and Sturminſter are alſo conſiderable towns near the line. The commencement is in the *Kennet and Avon* canal at Widbrook near Bradford, and the termination in the *Stour* river near Gains-croſs in Shilling-ſtone-Okeford; from near Froome a branch of about 9 miles proceeds to Nettlebridge collieries in Midſummer-Norton. The Nettlebridge branch was firſt cut, in order to ſupply coals to Froome and its neighbourhood; and water being ſcarce thereon, one of Mr. *Fuſſel's* balance-locks was erected on a 21 feet fall at Mells near Froome, and was publickly tried on the 6th of September, and 13th of October 1800, and in June 1802, as particularly deſcribed in a previous part of this article. An aqueduct bridge was erected ſeveral years ago over the river near Froome, but it is with ſlow pace, we fear, that the works are proceeding towards a final completion. The company were by the firſt act authoriſed to raiſe 225,000l. and a further ſum under the ſecond, we believe, the amount of ſhares being 100l. Stones are to be erected at every half mile: pleaſure-boats of 12 feet long and 5 broad may be uſed on the pounds, 30 yards in width are allowed, in general, for the company to purchaſe, and 100 yards wide for docks, wharfs, &c. ſprings may be taken and reſervoirs formed any where within 2000 yards of this canal.

DOUGLAS RIVER (*Lower Navigation.*) Acts 6 Geo. I. and 10 and 23 Geo. III. (for *Leeds and Liverpool*). The courſe of this navigation is nearly ſouth; for 9 miles in Lancaſhire it is but little elevated above the ſea; its objects are the export of common and cannel coals, and farm produce, and the import of lime-ſtone; it commences in the tide-way in the eſtuary of the *Ribble* river near Haſketh, and terminates in the *Leeds and Liverpool* canal at Brier's Mill. From the *Ribble* to Solom, about 5 miles, the river Douglas (or Aſland) is navigable, and thence to Brier's Mill is a canal 4 miles, with a riſe of 8 locks, the whole riſe from the *Ribble* being 49 feet. The width of the canal is 24 to 30 feet, and depth of water 5 feet; the locks are 70 feet long, and 15½ feet wide. The firſt act above authoriſed Meſſrs. *William Squires* and *Thomas Steers* to make the *Douglas* river navigable from the Ribble to Miry-lane end, near Wigan, which they effected about the year 1727; being allowed 2 s. 6 d. per ton for goods, whatever diſtance they might be navigated thereon; by the firſt act for the *Leeds and Liverpool* canal (10 Geo. III.), their ſucceſſors were authoriſed to make a junction with the *Leeds and Liverpool* canal at Newborough by a cut of 3½ miles long, parallel to this river, with a fall of 12 feet, which they completed in 1774, and the ſame now forms part of the *Leeds and Liverpool* canal, S.E. of Newborough aqueduct bridge, in conſequence of the purchaſe which that company made of the whole of this concern, in purſuance of their act of 23 of Geo. III.; ſince which, the canal from Brier's Mill to Solom above deſcribed, as part of the lower navigation, was cut and completed in 1781, and the river navigation between Solom and Wigan, 12 or 13 miles (on the upper navigation) has, we believe, been diſuſed ſince the *Leeds and Liverpool* canal was completed by its ſide to Wigan, and the communication by the lower *Douglas* navigation to the *Ribble*, above deſcribed, was opened.

DOUGLEDGE RIVER. The courſe of this river is nearly north in the county of Pembroke in South Wales, from the tide-way in *Milford-Haven* to Haverfordweſt bridge, its object being the ſupply of that town.

DRIFFIELD CANAL. Acts 7 and 41 of Geo. III. The courſe of this navigation is nearly north, for about 11 miles in the Eaſt Riding of Yorkſhire; it is but little elevated above the ſea; its general objects are the import of coals, deals, &c. and the export of farming produce; it commences at Aike-beck mouth in the *Hull* river, and terminates at the town of Great Driffield; the firſt five miles is by the courſe of the *Hull* river to Fiſh-holm clough, and the remaining 6 miles is by a canal; the courſe of the *Hull* river ſerves alſo as a branch of 1½ mile in length to Frodingham bridge. In 1764 Mr. *John Smeaton* was conſulted on this intended navigation.

gation. In 1804 it was in contemplation to deepen the Frodingham branch, and about 2 miles of the canal up to Snakeholme lock, nearly 2 feet deeper than it was before.

DROITWICH CANAL. Act 8 of Geo. III. The general direction of this canal is about N.E. for 5¼ miles in the county of Worceſter; it is not greatly elevated above the ſea; its objects are the export of ſalt and the import of coals, of which 13,500 tons are annually imported, and uſed in the boiling of ſalt, except what the town of Droitwich conſumes. It commences in the river *Severn*, at Hawford, and terminates at Chapel bridge in the town of Droitwich; it has a riſe of 59½ feet by 8 locks. This canal was executed by Mr. *James Brindley*, and it is ſaid to preſent a pattern to canal-makers by the neatneſs and regularity of its curves, and the ſtability and excellency of all its works. The proprietors were authoriſed to raiſe 33,400l. the amount of ſhares being 100l. The tonnage on every quarter of grain, or 6 buſhels of meal, is 2d. and on every ton of ſalt, coals, or other matters, 1s. 6d. By the act for the *Worceſter and Birmingham* canal (31 Geo. III.), the ſhares herein are guaranteed to produce 5 per cent. annually, and are to be made up by that company in caſe of their falling below that ſum. Owing to the overflowings of the copious ſalt ſprings near Droitwich, this canal preſents the curious ſpectacle of a ſalt-water canal, in the interior of the country, in which no river-fiſh can live.

DROMREAGH CANAL. This is a canal in Ireland, concerning which our information extends no further, than that the parliament of that country, between the years 1768 and 1771, granted 3000l. of the public money towards carrying on the works.

DRUMGLASS CANAL. This is a canal connecting with the Drumglaſs collieries in Ireland, towards the works of which canal, and thoſe collieries, the parliament of that country, between the years 1753 and 1771, granted no leſs than 117,714l. of the public money!

DUDLEY (*and Owen*) CANAL. Acts 16, 25, 30, 33, and 36 of Geo. III. The general direction of this canal is nearly N.W. by a crooked courſe of 13 miles in Worceſterſhire, a detached part of Shropſhire, and Staffordſhire; it is ſituate very high, its two ends are on the eaſtern ſide of the grand ridge, while its middle, by means of two very long tunnels, is on the weſtern ſide of the ſame. Dudley is the 49th Britiſh town with a population of 10,107 perſons, and the buſy and rich country through which this canal paſſes, furniſhes an ample tonnage in the export of coals, iron, and lime, while its communication with the *Stourbridge* canal, by the Black-Delph branch, and the terminating canals, occaſions a very conſiderable carrying trade thereon. This canal commences in the *Worceſter and Birmingham* canal at Selly Oak, and terminates in the old *Birmingham* at Tipton Green; from near Dudley there is a branch of 2 miles to the *Stourbridge* canal at Black-Delph in Kingſwinford, there is another branch of 1¼ mile to near Dudley town, and a branch from this laſt of ¾ of a mile to Dudley coal-works. From the *Worceſter and Birmingham* canal to the Black-Delph branch, 10½ miles are level, thence to near the entrance of the Dudley tunnel, about ¾ of a mile is a riſe of 31 feet by 5 locks, thence through the tunnel it is level, and from thence, in the laſt ⅛ of a mile, is a fall of 13 feet by 2 locks, to the old *Birmingham* canal: the Black-Delph branch has a fall of 85 feet by 9 locks to the *Stourbridge* canal; the Dudley branch has a riſe of 64 feet in the firſt ¾ of a mile, the remainder thereof being level, and the colliery branch level therewith. The depth of water in this canal is 5 feet; the width of the locks on the Black-Delph branch is 7 feet. To near Lapal, or Laplat, this canal paſſes through a tunnel 3776 yards long, at Gorſty hill it paſſes through another of 623 yards, under a collateral branch of the grand ridge, and at Dudley there is another tunnel of 2926 yards in length on the ſummit-level of the canal; the arch of this laſt tunnel has a height of 13½ feet. At Cradley-pool is a large reſervoir for ſupplying the lockage of the Black-Delph branch. It is provided, that level cuts may be made from this canal towards any coal-mine, to the extent of 2000 yards. A ſtop-lock is erected at the junction with the *Worceſter and Birmingham* canal, by which either company has a power of preventing the other from drawing off their head of water. The Black-Delph branch was firſt executed, which was then united with the Dudley part of the canal which had been conſtructed by lord viſcount Dudley and Ward; theſe were completed and in uſe before the extenſion or main length to Selly Oak was deſigned. The company has been authoriſed to raiſe 229,100l. the amount of ſhares being 100l. each originally. Owing to the different acts under which the parts of this canal were progreſſively undertaken, the rates of tonnage being different thereon, and to the variety of rates on different articles, we cannot attempt an account thereof in this ſhort abſtract, they will be found in *Cary's Inland Navigation*, p. 53 to 55, alſo p. 43, where certain rates are made payable to the old *Birmingham* company on account of the junction therewith, (but which have ſince been varied by the 34 of Geo. III. for *Birmingham* canal) and at p. 70. will be found other rates, in conſequence of the junction with the *Worceſter and Birmingham* canal. In the *Stratford* act (33 Geo. III.) are ſeveral regulations relating to tolls on goods paſſing to or from this canal; and this company are bound to make up the profits of the *Stourbridge* canal to 12l. per ſhare annually, but not exceeding 3l. on each ſhare.

*Durham and Cheſter-le-Street.* In February 1797 Mr. *Robert Whitworth* made a report in favour of a propoſed canal from the *Tyne* to Cheſter-le-Street, and thence to Durham, it was eſtimated to coſt 79,000l. and the probable advantage thereon to ſubſcribers was ſtated to be near 20 per cent. Durham is the 74th Britiſh town, with 7,530 inhabitants; this country abounds in coals.

EDEN RIVER. The general direction of this river is nearly S.E. for about 12 or 13 miles in the county of Cumberland; its principal objects ſeem the export of coals, and the ſupply of Carliſle, which is a conſiderable town. It commences in the tide-way of the *Solway* Firth, and terminates at Carliſle bridge. In 1795, the *Newcaſtle and Carliſle* canal was propoſed to join this river at Carliſle. In 1799 a *rail-way* from the earl of Carliſle's coal-works, near Brompton, to this river, was opened; and in 1803 another was intended from lord Lowther's coal-works at Warnel, about 11 miles diſtant from Carliſle.

EDINBURGH AND GLASGOW CANAL. This canal, projected about the year 1796, appears to have nearly a weſt direction for about 50 miles in the counties of Edinburgh, Linlithgow, and Lanark in Scotland; its objects are the export of coals and lime from Clydeſdale, through which it paſſes, and the opening of a direct communication between Edinburgh and Glaſgow. Edinburgh (and Leith) being the 3d Britiſh town, with a population of 82,560 perſons, and Glaſgow the 5th, with 77,385 inhabitants; from the ſcanty materials to which we have at preſent acceſs, it ſeems that this canal commences in the tide-way of the *Forth*, in the harbour of Leith, and terminates in the tide-way of the *Clyde*, in the town of Glaſgow, and was finiſhed in 1802; that at Glaſgow it connects with the *Monkland*, and in 1803 the *Glaſgow and Saltcoats* was propoſed alſo to join it.

*Eil and Shiel* canal. In the year 1803 Mr. *Thomas Telford* ſurveyed this line of canal, being a length of 3 miles from the tide way in Loch *Eil* within ſome miles of the weſt end of the *Inverneſs and Fort-William*, or Caledonian canal, to Loch Shiel, a freſh-water lake on the Highland coaſt of Scotland; Loch Shiel was found $7\frac{7}{12}$ feet higher than Loch *Eil*, and in order to conduct a 12 feet deep canal out of the former to the ſhore of the latter, it appears that deep cutting will be required, for about a mile to the depth of $47\frac{1}{2}$ feet, there being no water on the ſummit to ſupply a lockage up and down.

ELLESMERE CANAL. Acts 33, two of the 36, 41, 42, and 44 of Geo. III.; the general direction of this canal is nearly ſouth for 57 miles, by a crooked courſe through the counties of Cheſter, Flint, and Denbigh, (North Wales) and Salop; its principal ſummit is conſiderably elevated above the ſea; its great object is ſaid to be the improvement of the agriculture of the extenſive and fertile tracts, through which it paſſes, for uniting the *Merſey*, *Dee*, and *Severn* rivers, and exporting coals, lime, and ſlate, from the ſkirts of the Welſh hills. Liverpool is the 4th Britiſh town, with a population of 77,653 perſons, Cheſter is the 25th with 15,052 perſons, Shrewſbury the 36th with 14,739 perſons, and Elleſmere the 112th with 5,553 perſons; Wrexham, Whitchurch, and Oſweſtry, are alſo conſiderable towns on or near this canal or its branches. This canal commences in the *Merſey* river (9 miles above Liverpool) at Elleſmere-port in Netherpool, and terminates in the *Severn* river at Bagley bridge, very near to the termination of the *Shrewſbury* canal, to which it is propoſed to be joined; at the N.W. part of Cheſter city, it connects with the *Cheſter* canal, and near the ſame place croſſes and connects with the tide-way in the *Dee* river; from near Pulford a branch of 4 miles is propoſed to Holt; from near Gwerſelt a branch of — miles to Talwern coal-works in the pariſh of Mould, near the head of the Cegedog valley, where there is an opportunity of conſtructing a reſervoir of 82 acres to ſupply the ſame (this branch to paſs Frood collieries, Brumbo iron-works, and Nant-y-frith lime-works); another ſhort cut from Greſford to Allington; and a *rail-way* branch to Ruabon-brook; and to the river Dee at Llandinillo; from near Pont-Cyſylty, a branch to Acreſair coal-works; from Francton common, is a branch of about 25 miles paſſing the town of Whitchurch, to the *Cheſter* canal at Stoke in Acton pariſh near Nantwich; from which branch, another of about 7 miles proceeds from Fen-Moſs to Prees Heath; from Hordley on the main line, a branch of near 11 miles proceeds to the line of the *Montgomery* canal near Llanymynech, and the Verniew river; there being from this branch another to the termination of the *Montgomery* canal at Portywain lime-works near Llanyblodwell, and another ſhort one is intended to Marda bridge near Oſweſtry. From the *Merſey* to the *Dee* (ſometimes called the Wirral branch) the diſtance is 8 miles; from the *Dee* river to the Brumbo or Talwern branch it is $11\frac{1}{2}$ miles, with a riſe of 380 feet; thence along the ſummit pound, and through the Chirk tunnel $8\frac{1}{2}$ miles are level; thence to the north end of the great iron-aqueduct, $\frac{1}{2}$ a mile, is a fall of 75 feet; thence to St. Martins moor, 9 miles, it is level; thence to the Whitchurch branch at Francton-common, $2\frac{3}{4}$ miles, is a fall of 13 feet; thence to the Llanymynech line at Hordley is $\frac{1}{4}$ of a mile with 33 feet fall; thence to Ormond park, $14\frac{1}{2}$ miles, is level; and thence to the *Severn* river at Shrewſbury is 2 miles with a fall of 107 feet. The Holt branch is level, the Whitchurch branch to that town, 14 miles, is level, and thence to the *Cheſter* canal, 11 miles, has a fall of 128 feet; the Prees Heath branch is level, the Llanymynech branch, 12 miles, has a fall of 19 feet. The depth of water in this canal is $4\frac{1}{2}$ feet, and the canal in general is calculated for boats of 70 feet long and 7 wide; but the Wirral-branch is formed for boats of 70 feet long and 14 feet wide. There is a tunnel near Chirk of 775 yards in length, and another at Weſton-Lullingfield of 487 yards in length. At Pont-Cyſylty, this canal is carried over the river Dee in an immenſe aqueduct trough, compoſed of caſt-iron plates, 20 feet wide, 6 feet deep, and 320 feet long; this is ſupported on 19 pair of conical ſtone pillars at 52 feet aſunder, and the middle ones 125 feet in height! at Chirk is a very large ſtone aqueduct bridge of 10 arches, 200 yards in length and 65 feet high, over the Ceriog river; and over the Allen river there is alſo an aqueduct bridge. This canal is fed from the Dee river by the Llandinillo branch, and that river is compenſated by a cut from Bala-pool, and, all ſprings within 2 miles of this canal may be taken for its uſe. Near Ruabon, one of *Rowland and Co.*'s balance locks was, in 1797, tried on a 12 feet fall for ſaving water, as before mentioned. The engineers employed on this extenſive work, were Meſſrs. *William Jeſſop*, *Thomas Telford*, *— Fletcher*, and *Thomas Dadford*; the moſt conſiderable progreſs was firſt made at the northern end of the line, and in February 1796, flatts laden with coals began to arrive at Cheſter from the Lancaſhire collieries by the Wirral branch, and ſoon after convenient paſſage-boats were eſtabliſhed, for the regular conveyance of paſſengers towards Liverpool or back, at lower rates than is charged on *Bridgewater*'s canal, according to diſtance. In January 1797, the navigation was continued to Beeſton brook; and in the ſame year the ſouthern end of the line was opened from Shrewſbury to the Weſton-Lullingfield tunnel. The immenſe aqueduct at Pont-Cyſylty was in hand in 1804, and was more than half completed before the end of that year, as was alſo the ſtone aqueduct at Chirk. The company are authoriſed to raiſe 500,000l., the amount of ſhares being 100l., which it ſeems were, in 1802, at 20l. below par. The rates of tonnage are, for coals, culm, limeſtone, lime, and ſalt, $1\frac{1}{2}$d. per ton per mile; for free-ſtone, timber, ſlate, iron-ſtone, lead-ore, iron, and lead, 2d., and for all other goods 3d. per ton per mile, except road materials and manures (but not lime) upon the pounds, or when the water flows waſte over the lock-weirs. On croſſing the *Dee* river at Cheſter, goods pay 2d. per ton to the Dee company, and their tolls are guaranteed to the amount of 210l. annually. While this canal was projecting, a rival ſcheme was ſtarted, called the Eaſtern Grand Trunk from the *Severn* at Shrewſbury to the *Cheſter* canal at Crow's neſt, with cuts to Vable-Cruis, to Bonham-Furnace, Holt, and other places.

EREWASH CANAL. Act 17 Geo. III.—The general direction of this canal is nearly north for $11\frac{3}{4}$ miles along the ſkirt of the county of Derby, near to Nottinghamſhire; its northern end is conſiderably elevated above the level of the ſea; its chief object is the export of coals from the numerous collieries on its banks, and thoſe on the banks of the *Nutbrook* canal which joins it at Stanton, and the *Nottingham* canal which joins it near Langley Bridge; the branch of the *Derby* canal joins it between Sandiacre and Long Eaton, and the *Trent* canal near Sawley. It commences in the *Trent* river near Sawley (oppoſite nearly to the *Loughborough* navigation or Soar river,), and terminates in the *Cromford* canal at Langley Bridge, the riſe being $108\frac{2}{3}$ feet; there is an iron *rail-way* branch to Brinſley coal-works, on which an experiment was, as before related, made about the year 1800, on the load which one horſe could draw both up and down the declivity. By the act of 33 of Geo. III. for *Derby* canal, a reduction of the rates between the junction therewith and the *Trent* river was made, conditionally, that no other junction be made between this canal and Derby, but the preſent one near Sandiacre; and by the 34 of Geo. III. for *Trent* river, the annual rent of 5l. is commuted for a toll of 6d. on every laden boat which ſhall croſs the *Trent* between the

Soar river and this canal. A reſervoir belonging to the *Nottingham* canal has a gauge-ſluice, which furniſhes a regular and daily ſupply of water to this canal. The firſt ſurvey for this line of canal was made in the year 1776.

Eske River, (*Montroſe*). This river is navigable but a ſhort diſtance in the tide-way from the German Ocean to the town of Montroſe, in Angus county in Scotland. Montroſe is the 67th Britiſh town, with 7,974 inhabitants.

Eske River, (*Whitby*). The navigable part of this river is but ſhort, in a S.W. direction in the Eaſt Riding of Yorkſhire: it commences at the German Ocean, and extends to Whitby bridge. In 1765 Mr. *John Smeaton* was conſulted about clearing this river and the harbour of Whitby, of the ſhail or refuſe ore, from which alum had been manufactured, and whereby the harbour had become in time nearly choaked up. Whitby is the 75th Britiſh town, with a population of 7,483 perſons; within a few years paſt, a pier has been built with free ſtone, under the direction of Mr. *John Rennie*, for the improvement of the mouth of this harbour.

Exe River. The courſe of this river is nearly N.W. for about 10 miles in the county of Devon; its principal object ſeems the ſupply of Exeter and Topſham; near Topſham it is to be joined by the *Grand Weſtern* canal. It commences in the Engliſh Channel at Exmouth, and terminates at the city of Exeter, which is the 21ſt town in Britain, with 17,398 inhabitants: from Exeter it was in 1800 propoſed to continue the navigation to Crediton; and in 1769, the *Exeter and Uphill* canal was propoſed to be made from the ſame place.

*Exeter and Crediton.* In the year 1800 it was propoſed to make the rivers Exe and Credy navigable, from Exeter city to the town of Crediton, about ſeven miles, above Exeter quay on the river *Exe*.

*Exeter and Uphill.* In 1769 Mr. *John Brindley* ſurveyed the country for a canal from the river *Exe* at Exeter, by Tiverton, Wellington, Taunton, and Glaſtonbury, to the Britiſh Channel near Uphill; the objects of which have been ſince embraced in the *Grand Weſtern* canal.

Fergus Canal. This is one of the Iriſh inland navigations, in aid of which, public money was from time to time granted, though in the preſent inſtance we are told that it amounted to no more than 85l.

Forth River, (*or Firth*). This principal river of North Britain has its courſe nearly weſt for about 70 miles between the counties of Fife, Haddington, Edinburgh, Linlithgow, Stirling, Perth, and Clackmannan, the firſt 33 miles being a very wide eſtuary, the next 18 miles are ſtill of conſiderable width, and the laſt 13 miles next Stirling are remarkably crooked. An immenſe general trade is carried on upon this river, and for the ſupply of the metropolis of Scotland, aſſiſted by the *Edinburgh and Glaſgow* canal, that joins it at Leith, the *Burrowſtowneſs* at that town, the *Forth and Clyde*, or great canal at Grangemouth, the *Caron* river near Rothkennar, and the *Devon* river near Cambus Quay. Edinburgh (with Leith) is the 3d Britiſh town, with 82,560 inhabitants, Dumferline is the 52d, with 9,980 perſons, and North Berwick, Crail, Anſtruther, Dyſart, Kirkaldie, Kinghorn, Bruntiſland, Inverkeithing, Muſſelburgh, Queen's-Ferry, Burrowſtowneſs, Linlithgow, Falkirk, Culroſs, Clackmannan, Alloa, and Stirling, are alſo conſiderable towns on or near this fine river. It commences in the German Ocean, and terminates at Stirling bridge, and is navigable for ſhips through a great part of its courſe; at Cambus Quay the ſpring tides riſe 20 feet, but below this there are ſands called the Thraſk Shallows, concerning the removal of which, Mr. *John Smeaton* was conſulted in 1767. In 1801, the channel ſouth of Inch-keith iſle was deepened, to enable ſhips to approach Leith harbour ſafely and readily. Leith harbour has undergone great improvements of late years under the acts of the 28, 38, [illegible] and 45 of Geo. III., by the laſt 25,000l. of the public money was granted for the wet-docks and other works which have been carrying on there under Mr. *John Re*[illegible] ſince the laying of the foundations, 14 May 1801. Methil harbour on the north ſide of the *Forth* is alſo under improvement, and by the 45 of Geo. III., 2,000l. of the public money was granted towards the building of the pier there. In the year 1767, Meſſrs. *Watt* and *Moriſon* ſurveyed the upper part of the *Forth* river, and propoſed to extend a navigation from Sterling bridge to the ſlate and lime quarries in Aberfoil, on which the opinion of Mr. *John Smeaton* was alſo taken.

Forth and Clyde Canal. Acts 8, 13, and 24 of Geo. III. — The general direction of this great canal is nearly weſt for 35 miles, in the counties of Stirling, Dumbarton, and Lanerk, in Scotland: it croſſes a low part of the grand-ridge between the tide-ways of the eaſt and weſt ſeas; its principal object is a communication between thoſe important rivers, the *Forth* and the *Clyde*, and between the northern metropolis, and the great manufacturing towns of Glaſgow, Paiſley, &c.; near to Grangemouth the *Burrowſtowneſs* canal joins it. Glaſgow is the 5th Britiſh town, with a population of 77,385 perſons, and Falkirk the 59th, with 8,838 inhabitants. Kirkintulloch and Dumbarton are alſo conſiderable places near the line. This canal commences at Grangemouth harbour in the *Forth* river, and terminates at Bowlings bay near Dalmuir-Burnfoot, in the *Clyde* river. There is a cut of 2¾ miles to the town of Glaſgow, where it joins the *Clyde* river, the *Monkland* canal, and the *Edinburgh and Glaſgow* canal; and it was in 1803, propoſed to join the *Glaſgow and Saltcoats* canal; there is another cut with a lock into the *Caron* river at Caron-ſhore, near the great Caron iron-works. From low-water in the *Forth* in Grangemouth lock, N° 1, to lock N° 20, 10¼ miles, is a riſe of 165 feet; thence to lock N° 21, the ſummit-level is 16 miles, and thence to low water in the *Clyde* at Bowling's bay lock, N° 39, is a fall of 156 feet; the width of the canal is 56 feet at top, and 27 at bottom, and the depth of water 8 feet; each lock is 75 feet long, and 20 feet wide in the clear, and veſſels of 70 or 80 tons are uſed. This canal is croſſed in 33 places by draw-bridges, has 33 culverts or arches under it, and 10 large aqueduct bridges; that over the Kelvin is 400 feet in length, and 70 feet high above the ſurface of the river, (ſee *figs.* 19, 20, and 21, *Canals*, *Plate* II.) and there is a large aqueduct which croſſes the turnpike road from Glaſgow to Stirling at Kirkintulloch. At Kilmananmuir is a reſervoir of 70 acres extent, and 22 feet deep at the ſluice; and near Kilſyth is another of 50 acres, 24 feet deep for ſupplying the ſummit-level of this canal. In Bowlings-bay, and near the Kelvin aqueduct, are dry-docks, and other conveniences for repairing of veſſels and boats. Mr. *John Smeaton* was firſt employed to ſurvey this line in 1764, and he laid the preſent deſign, and executed a conſiderable part of the eaſtern end before 1775, when the work ſtood ſtill for ſome years, after which, Mr. *Robert Whitworth* was called in; he completed the remainder, and it was opened with great ſolemnity on the 28th of July 1790. The deſign of a canal between the *Forth* and *Clyde* has been at times entertained ever ſince the reign of Charles II., and beſides the above engineers, ſince the year 1723, Meſſrs. *Gordon*, *Mackell*, *Watt*, *Brindley*, *Golborne*, *Thomas Yeoman*, &c. have been conſulted or employed. The canal was firſt made to commence in the *Caron* river, about a mile from its mouth, but was afterwards continued into the *Forth* at Grangemouth harbour. The proprietors were authoriſed in their firſt act to raiſe 200,000l. in 100l. ſhares; after which, 50,000l. of the public money was granted to aid the work; in 1783, 212,000l. had been expended, and no dividend or intereſt had been paid on the ſhares. The rate of tonnage is 2d. per ton per mile on all kinds of goods, except lime and lime-ſtone, which is to pay $\frac{1}{2}$d., and iron and iron-ſtone 1d. per ton per mile, while road-materials (except lime-ſtone) and manures are to paſs toll free. For unloading or loading of Britiſh or Iriſh veſſels in Grangemouth harbour, 1d. per ton is to be paid, (by 24 Geo. III.) and for foreign veſſels 2d. per ton. Rafts of fir timber are allowed to be floated upon this canal and paſs the locks, theſe often contain 70 tons each. An accident is related of a veſſel coming down from the weſtward on this canal, when the wind blew ſtrong from that quarter, and not being ſtopped in time at one of the locks, ſhe bore down the gates, and went down ſuddenly into the pound below. In December 1801, a veſſel conſtructed by Mr. *Symington*, (as already deſcribed) was tried on this canal for dragging or towing boats, by the operation of a ſteam-engine; to the head of this veſſel ſtampers were applied, that could be worked by the engine for breaking ice, when the canal is frozen over.

**Foss-dyke Canal.** The general direction of this navigation is nearly S.E. for 11 miles, in the counties of Lincoln and Nottingham; it is upon one level, not much elevated above the ſea, though a great diſtance from it, and preſents the curious inſtance of a canal diſcharging its waſte water into one river (the *Witham,*) while flood-gates are neceſſary at the other end, to keep out the waters of the other river (the *Trent*); its object is a communication between theſe two rivers, for ſupplying coals and exporting farm produce. Lincoln is the 76th Britiſh town, with a population of 7,398 perſons. This canalcommences in the *Trent* river at Torkſey, and terminates in Brayford meer, a natural pool in the *Witham* river, near Lincoln. It has a lock at Torkſey, conſtructed on the principle of a ſea-lock, that is capable of penning the water into the canal, or out of it, according to the circumſtance whether the *Trent* or it may be the loweſt; between Brayford meer and Lincoln high-bridge, a hard of gravel or ſhallow, called Brayford head, held up the water in this canal, to about $2\frac{2}{3}$ feet deep, which otherwiſe would, in dry times, have been emptied into the Witham, too low for navigation. Mr. *John Smeaton* and Mr. *John Grundy* were conſulted in 1762, and the former engineer again in 1782, when he recommended raiſing the banks of this canal to obtain a better depth of water, cutting off its connection with the Witham by a pound-lock, and ſupplying it with water by an aqueduct or feeder, from a reſervoir to be made near the Witham, ſouth of Brayford meer. We are not acquainted with the date when this canal was firſt dug or made navigable; Mr. Elliſon's wharf thereon, near its eaſt end, was, it appears, built about 1742.

**Foss Navigation.** Acts 33 and 41 Geo. III.—The direction of the *Foſs* river, which this navigation follows, is nearly N. by a crooked courſe of about 13 miles, through the North Riding of Yorkſhire: its elevation is not very great above the level of the ſea; its objects are the ſupply of the city of York, the import of coals for the uſe of the adjacent country, and to effect a better drainage of the ſame. York is the 23d Britiſh town, with 16,145 inhabitants. This navigation commences in the *Ouſe* river at the city of York, and terminates at Stillington mill. It is fed by a reſervoir on Oulſtone moor: it appears that the corporation of York were by a licence of king *Richard* II. required to erect and maintain proper bridges over this river. This company were authoriſed to raiſe 45,400l. the amount of ſhares being 100l. each. The rates of tonnage will be found in *Phillips' 4to. Hiſtory, Appendix*, p. 81 and 82; and in the laſt act, by which an additional $1\frac{1}{2}$d. per ton, on heavy articles, were impoſed, and by which the proprietors were authoriſed to proceed no higher than Sheriff-Hutton bridge with their works, until the neceſſary funds were accumulated to proceed with the remainder of their line. Some years ago, a pleaſure-boat, made wholly of ſheet iron, was tried on this navigation, 12 feet long, and capable of carrying 15 perſons, and yet ſo light that two men could carry it.

**Glamorganshire Canal.** Acts 30 and 36 Geo. III.—The general direction of this canal is nearly N.W. for 25 miles, in the county of Glamorgan in South Wales. Its objects are the export of the produce of the immenſe iron, coal, and lime works in the neighbourhood of Merthyr Tidvil, &c. and the ſupply of the rapidly increaſing population thereof; at Eglwyſila the *Aberdare* canal joins, and the *Cardiff and Merthyr* rail-way runs by its ſide, and joins it at thoſe two places. Its northern end is conſiderably elevated. Cardiff and Caerphilly are conſiderable towns on or near the line; it commences in a ſea-baſon, or dock, in the *Severn*, at the Lowyer-layer near Cardiff, and terminates near the town of Merthyr; it has a *rail-way* branch from Merthyr to Dowlais iron works. From the tide-way at Lower-layer to Merthyr is a riſe of near 600 feet, and during a part of this diſtance the canal ſkirts precipitous mountains at the height of near 300 feet above the river Tav or Taaff, which it cloſely accompanies through its whole length. The floating dock at Lower-layer is 16 feet deep, in which a great number of ſhips, of 300 tons burthen, can lie conſtantly afloat, and load or unload, either at the ſpacious warehouſes on its banks, or from, or to, the boats belonging to this canal, or the trams uſed on the *Cardiff and Merthyr* rail-way, that here commences. There is a large aqueduct bridge over the Tav near Gallygare. This company were authoriſed to raiſe 100,000l. and to the powers for raiſing the laſt 10,000l. this ſingular condition was annexed, viz. that the whole concern ſhould be completed within two years, after which no further money ſhould be applied, except for repairs. At Merthyr there is a famous water-wheel, made of caſt-iron, 50 feet diameter, at Mr. Crawſhaw's works; the water being conveyed thereto for a great diſtance in an iron aqueduct.

*Glaſgow and Saltcoats.* In May 1803 the line of country between the *Clyde* river at Ardroſſan, near Saltcoats, and the *Clyde* river again at Glaſgow (paſſing Paiſley and connecting with the *Cart* river) was ſurveyed by Mr. *John Rennie;* in 1805, the ſubject was revived, and met the ſupport of the earl of Eglingtown and many others, coupled with the deſign of building a pier on a ledge of rocks near Caſtle Craigs, and forming wet-docks, &c. to be called Ardroſſan harbour, for which an application was made to parliament in the ſame year. At Glaſgow this canal would connect with the *Forth and Clyde*, the *Monkland*, and the *Edinburgh and Glaſgow:* the line thereof is through a country rich in coals and lime-ſtone.

**Glenkenns Canal.** Act 42 Geo. III.—The direction of this canal is firſt N.E. and then N.W. for about 27 miles, in Glenkenns, in the county of Kirkcudbright in Scotland: it is not very greatly elevated; the object of it is the export of the coals, iron-ſtone, lime, and other minerals with which the country abounds; Kirkcudbright and New Galloway are conſiderable towns near the line. It commences in the tide-way in the *Dee* river at Kirkcudbright, and terminates in the boat-pool at Dalry. There is proviſion made for branches to the neighbouring mines and rail-ways, and inclined planes may be ſubſtituted, inſtead of a canal and locks in any part. The company is authoriſed to raiſe

raiſe 45,000l. the ſhares being 100l. each, but it is provided, that the works are not to commence until 20,000l. is ſubſcribed, and that within five years, or the powers of the act are to ceaſe; water may be taken from within 2000 yards of the line, except certain ſtreams uſed for irrigation.

**Gloucester and Berkley Canal.** Acts 33, 37, and 45 Geo. III.—The general direction of this canal, one of the largeſt in England, is nearly N.E. for 18¼ miles, in the county of Glouceſter; it is but very little elevated above the ſea; its object is to ſhorten the navigation for ſhips by a ſerpentine courſe of 28 miles on the *Severn* river, between Berkley and Glouceſter; near Wheatenhurſt it croſſes and unites with the *Stroudwater* canal; Glouceſter is the 72d Britiſh town, with a population of 7,579 perſons; Berkley is alſo a conſiderable place. This canal commences with a ſea-lock in the *Severn* river at Berkley-pill, and terminates in a grand and capacious baſon, connecting with the *Severn* river at Glouceſter, it has a ſhort branch to a new wharf at Berkley town, and another of about 2 miles in length to the *Severn* river at Hock-crib in Arlingham; the whole is on one level with tide-locks at its connecting points with the *Severn* to preſerve its water at one conſtant height. This canal is 70 feet wide, and 15 or 18 feet deep in water, and the locks, &c. thereon, are capacious enough to admit ſhips of 300 tons burthen to paſs! The company are authoriſed to raiſed 200,000l. in 100l. ſhares. The tonnage varies on different ſized veſſels, and is too long for us to inſert, the particulars will be found in *Phillips' 4to. Hiſtory, Appendix*, p. 83 and 84. Unforeſeen difficulties have attended the execution of this wide and deep canal, by interſecting a hard rock for great diſtances in the level meadows, where no ſuch thing was expected. Some immenſely large ſlips have happened in the banks, and the walls of the Glouceſter baſon ſlipped in, notwithſtanding the land-ties which had been provided; the upper end of the canal, for ſeveral miles, has been finiſhed; in 1797, it was ſaid that only 6 miles remained to be cut; and we hope, that the act of laſt ſeſſions will be the means of ſpeedily completing the whole. Mr *Haſkew*'s machine, calculated to aſſiſt in excavating a canal, was here tried in 1796, as before mentioned.

*Glouceſterſhire Rail-way.* In the year 1804 it was propoſed to conſtruct a rail-way from the *Avon* river at Bitton below Bath to Sodbury coal-works in Glouceſterſhire, with branches to Pucklechurch, Haul-lane, Coal-pit-heath in Weſterleigh, Smith's tynings, and other collieries, in order to bring their produce to Bath and Briſtol, and for the conſumption of the interior of the country, by means of the *Kennet and Avon* canal.

**Grand Canal**, (*Ireland*). This canal was commenced, we believe, ſoon after the year 1753, but we have not the dates of the earlier acts; ſince the union there was one paſſed, the 43 Geo. III. The general direction of this canal is nearly weſt, for 61½ miles through Dublin, Kildare, and King's Counties, in Ireland; it paſſes a low part of the grand ridge of Ireland, on the Bog of Allen. Its objects are the ſupply of Dublin with coal, &c., the varied produce of the banks of the *Shannon*, and opening an inland communication through the country. It commences in a grand baſon in James-ſtreet, Dublin (which connects with the *Liffey* river and the new *Docks*), and terminates in the *Shannon* river, at Tarmonbury, near Moy's Town; it has collateral branches to the *Boyne* river at Edenderry, to the *Barrow* river at Moneſtraven, and alſo at Portarlington; there are alſo branches to Naaſtown and to Johnſtown. This canal is, we believe, 5 feet deep, the locks are 80 feet long and 16 wide, in the clear, and are built of hewn ſtone; it has employed the attention of various engineers, among whom are mentioned, Meſſrs. *Omes*, *Vallency*, *John Trait*, *William Jeſſop*, &c. In the year 1770 this canal had proceeded from Dublin into the Bog of Allen, when, owing to miſmanagement, it ſtood ſtill for ſeveral years, and it was not until the beginning of 1804 that the whole line was finiſhed and opened. The ſums of the public money which have been granted by the parliaments to aid this work are immenſe; between 1753 and 1771 they amounted to 78,231l. It has been propoſed to reduce the tolls or tonnage ſince the opening of this canal. In the beginning of the preſent year (1805) it was propoſed to continue a branch from this canal, near Athy, for 9 miles, to the foot of the Doonane Hills, in Queen's county, and thence to tunnel two miles into the hill, to drain the rich veins of coal therein, and bring out their produce.

**Grand Junction Canal.** Acts 33, 34, three of the 35, 36, 38, 41, 43, and two of the 45 Geo. III.—The general direction of this canal is nearly north-weſt for 90¼ miles, in the counties of Middleſex, Hertford, Buckingham, Bedford (a very ſmall diſtance), and Northampton. It has a ſummit of conſiderable height near Tring, which it paſſes without a tunnel; and near its northern end it croſſes the grand-ridge by a tunnel. Its principal objects are, a communication between the metropolis and the various canals of the midland counties, the ſupply of coals, deals, ſlate, &c. to the ſeveral towns on the line and branches, and the export of the agricultural products, lime, flints, &c. of the country through which it paſſes; at Northampton it joins the *Nen* river by a *rail-way* branch, and the ſame is intended there alſo to join the *Leiceſterſhire and Northamptonſhire Union* canal. London, as is well known, is the firſt town in Britain for population, with 864,845 inhabitants, and Northampton is the 85th, with 7,020 perſons; Brentford, Uxbridge, Rickmanſworth, Watford, St. Albans, Hemel-Hempſtead, Berkhampſtead, Tring, Wendover, Ayleſbury, Leighton-Buzard, Fenny-Stratford, Newport-Pagnel, Stoney-Stratford, Buckingham, Towceſter, and Daventry, are alſo conſiderable towns on or near this canal or its branches. The commencement of this canal is in the river *Thames*, near the extremity of the tideway at Brentford creek, and its termination in the *Oxford* canal at Braunſton. From Bull bridge a branch, 13½ miles in length, goes to Paddington, one of the environs of London; to the town of Rickmanſworth, there is a cut of about ¼ of a mile, with a lock at its entrance; from Bulbourn head a branch extends for 6¾ miles to Wendover; from Coſgrove a branch of 1¼ mile extends to Stoney or Old Stratford, and thence 9½ miles further to Buckingham; and from Gayton a *rail-way* branch of 5 miles extends to the river *Nen*, and the intended termination of the *Leiceſterſhire and Northamptonſhire Union* canal at Northampton. To Watford a branch of 2 miles, and thence about 8 miles farther to St. Albans, has been ſurveyed and provided for in the acts; another to Ayleſbury of about 6 miles, and another to Daventry of 1½ mile in length, but theſe laſt are not executed. From the *Thames* at Brentford to Two-waters is 28½ miles, with 268 feet riſe; thence to Cowroaſt is 7¼ miles, with a riſe of 127 feet; thence to the Wendover branch is 3¼ miles, of the higheſt ſummit-level; thence to the croſſing of the Ouſe river, between Wolverton and Coſgrove, is 25¼ miles, with a fall of 192 feet (this being the loweſt place); thence to Stoke Bruern is 6½ miles, with a riſe of 112 feet; thence (through the Bliſworth tunnel) to the ſouth end of Whitton pariſh, 13½ miles, is level; thence to Whitton mill, in Long Buckby, ¾th of a mile, is a riſe of 60 feet; thence along the ſummit-level, and through Braunſton tunnel to its north end, 4¼ miles, is level; and thence to the *Oxford* canal at Braunſton, near 1 mile, is a fall of 37 feet. The Paddington branch is level (at about 90 feet above the *Thames*, and 48½ feet above the Strand-pavement at Exeter-change).

change). The Wendover branch is level, and connects with the Bulborne or Tring ſummit pound: the Buckingham branch has a riſe of 15 feet; the Northampton branch has a fall of 120 feet, and the cut to Daventry is to have a riſe of 60 feet. The width of the main line is 36 feet at top, about 24 feet at bottom, and 4½ feet deep in water: the Wendover branch is 28 feet wide at top, 18 at bottom, and 4½ feet deep; and the Buckingham branch is only 20 feet wide at top, 10 at bottom, and 4½ feet deep in the general. The Northampton rail-way, which is now (October 1805) nearly or quite finiſhed and ready for opening, is of iron, and double, that is, has two roads for the carriages going different ways. The locks on the line are 86 feet long, 15 feet wide in the clear, and riſe about 7 feet each on the average, requiring about 9030 cubic feet, or 250 tons of water to fill them each time that a barge paſſes. On the line there are 101 locks, beſides the 9 ſpare ones in Wolverton-valley; on the Buckingham branch there are 2 locks. Two kinds of veſſels are in uſe upon this canal, barges with ſquare heads and ſterns, and flat bottoms, that carry 60 tons, and boats with ſharp ends, or nearly ſo, of half the width, that carry 25 tons. At White-friars, juſt above Black-friars-bridge, on the *Thames*, this company built extenſive warehouſes, over a dock, in which barges lay afloat from one tide to the next; theſe are now let to Mr. *Pickford*, the great waggon and boat-maſter. At Paddington a ſpacious baſon or ſtraight cut, 400 yards long and 30 wide, has been formed with wharfs at its head, and others are daily extending weſtward along its ſides; behind this, on the north ſide, is a ſpacious yard for a vegetable and a hay and ſtraw market, with immenſe ſheds, under which loads of thoſe articles can ſtand in the dry when it rains; and on the ſouth ſide pens are erected and proviſion made for a large cattle market. The number of wharfs erected on this extenſive line and its branches by individuals are too great for us to attempt to particularize them. The number of culverts or ſmall water-courſes under the canal and its branches are very great. And on the towing path there are a number of large and high wooden bridges for croſſing the entrances to branches, docks, or over ſtreams of water; for ſome diſtance from Paddington proviſion is made under the bridges for a towing path on each ſide of the canal. The tunnel between Stoke-Bruern and Bliſworth (already deſcribed), is 3080 yards in length, 15 feet wide, and 19 feet high, at 60 feet below the top of Bliſworth hill, through which it penetrates. Braunſton tunnel, between that place and Daventry, is 2045 yards in length: another tunnel was at firſt intended near King's-Langley for avoiding Caſhiobury, and other parks in the Colne valley; but an agreement was afterwards come to with their owners for a paſſage through them, inſtead of tunnelling. Between Cow-roaſt and Bulbourne there is an immenſe deep-cutting for paſſing the great range of chalk-hills near Tring; this extends for 3 miles, and is 30 feet deep in the higheſt part; near Dawley there is a great length of deep-cutting through the immenſe bed of gravel at that place; at the ends of the Bliſworth tunnel, and at ſeveral other places there are alſo deep-cuttings. Between Wolverton and Coſgrove a ſtupendous embankment, with three aqueduct arches under the ſame, has been conſtructed, ſince the locks were made for croſſing the Ouſe river, as above mentioned, over which the canal has, ſince Auguſt 1805, been conducted, aud by which 4 locks on the ſouth ſide of the valley, and 5 locks on its north ſide, are avoided, except a lock of 18 inches riſe, near the north end of the embankment, by which 12 miles in length of level pound is held up (on the line and Buckingham branch), and ſeparated from 10 miles of level pound ſouth thereof, to beyond Fenny-Stratford town, (where another lock of only 18 inches riſe occurs, to hold up a pound of ſome miles in length that was intended, but for a miſtake in the levelling, to have been in one pound); this embankment is ½ a mile long, and 30 feet high, where it croſſes the Ouſe. At Weedon-Beck, and at Bugbrook, there are alſo moſt ſtupendous embankments, and river and road aqueduct-arches, and many leſſer embankments and aqueduct bridges occur on the line and branches; thoſe over the Brent river, and over Bays-water on the Paddington branch are conſiderable. On Harefield Moor there is a very wide and large piece of water on the canal: others at Great Berkhampſtead, at Halton park, and two other places on the Wendover branch. Five conſiderable reſervoirs have been conſtructed for preſerving water for this canal, or the mills, whoſe ſtreams have been diverted for its uſe; that at Aldenham covers 68¼ acres, at Wilſtone is one of 40 acres, and thoſe at Weſton-Turville, Braunſton, and Daventry, are alſo of very conſiderable dimenſions. The principal feeder for the ſouthern ſummit is at Wendover, and there are others at Little Tring, Tring, and Miſwell (the laſt being arched over for ¼ of a mile). The middle and lower part of the line is ſupplied by a feeder at Soulbury, and the northern ſummit is ſupplied by a feeder from Watford, near Daventry; beſides which, that ſummit has had its banks raiſed to accumulate an extra depth of water in wet times, and a ſteam-engine has recently been erected for pumping up the water out of the level of the *Oxford* canal to that ſummit, that is let down therefrom by the lockage. At Little Tring an engine was, in June 1803, erected for pumping the water collected in Wilſtone reſervoir into the Wendover branch of the ſouthern ſummit-level; and at Naſh mill, ſome diſtance below Two-waters, in the Colne valley, an engine is now erecting to return the lockage water of 4 locks that are there placed near to each other. On the ſouth and north ſides of the Tring ſummit, ſeveral pairs of ſide ponds have been lately added to the locks, for ſaving part of their conſumption of water. Where the Towceſter river (the Tove) is croſſed and joined there are very conſiderable weirs or tumbling-bays, and others on the old courſe, in the Wolverton valley; and, between Great Berkhamſtead and Uxbridge, theſe are continually occurring, owing to the canal having unfortunately been conducted into and through almoſt every mill-dam in that diſtance: overfalls of leſs ſize are alſo very common on every part of the line, ſo are ſtop-gates, trunks, and every other neceſſary appendage and convenience to a navigable canal. Mr. *William Jeſſop* was the engineer to this extenſive concern; Mr. *James Barnes* and Mr. *John Holland* were employed in executing different parts of the works, on which Mr. *Thomas Telford* was lately employed to report his opinion; ſince 1803 Mr. *Benjamin Bevan* has been employed in repairing the leaky parts, conſtructing ſide-ponds, &c. in the middle diſtrict of this canal. The works on this canal commenced at both of its extremities, ſoon after the paſſing of the firſt act; and the tunnel at Braunſton being completed, the navigation was opened, in July 1796, as far ſouthward from the *Oxford* canal, as the great embankment at Weedon Beck; in June 1797, the ſame was extended to the next great embankment at Bugbrook; and about November in the ſame year, to the north end of the intended tunnel at Bliſworth. Beginning at the ſouthern end in the *Thames*, the navigation to Two-waters was completed in June 1798, and in June 1801 the branch therefrom to Paddington was opened; in the year 1799, the canal was completed to Bulbourne, and the branch therefrom to Wendover; in June 1800, it was extended to Fenny-Stratford; and about October 1800 to the ſouth end of the intended tunnel at Bliſworth; at the ſame time a double iron *rail-way* of near 3½ miles in length (ſince removed) was laid acroſs Bliſworth

Hill, to connect the two parts of the canal, and form the much wiſhed for grand junction; in May 1801, the branch to Buckingham was opened; it was not until March 1805 that the Bliſworth tunnel was completed, and the navigation of the whole line opened; and, laſtly, in Auguſt 1805, the immenſe Wolverton embankment was opened for improving the ſame, and avoiding 8 locks, but which locks ſtill remain by its ſide, as a reſerve, in caſe of accident, to this immenſe mound of earth, or the three large arches under it. This company were authoriſed by their firſt nine acts to raiſe 1,528,000l. to which their firſt act of laſt ſeſſion made a conſiderable addition; and it is feared that the expenditure will altogether exceed two millions ſterling! The ſhares are of 100l. value each, which have at ſome periods of the buſineſs ſold as high as 210l., and at others have been down at 65l.! Shares in this concern are allowed to be ſplit into ſuch ſmall portions among different holders, as ⅛th or 12½l. each. On the original ſhares no dividend or intereſt has yet been received, but now as the tolls amount to full 7,000l. per month, it is hoped a dividend will begin to be made. Inland coals from the rich and inexhauſtible mines with which this and other canals form direct communications, were forbid under ſevere penalties (although two legiſlative attempts to enforce the ſame proved ineſficient) to be brought nearer to London than the N.W. end of Grove park in Hertfordſhire, until the laſt act of the late ſeſſion mentioned above, by which 50,000 tons of ſuch coals are allowed to be brought to Paddington in the current year, on paying a duty equivalent to that paid in the *Thames* on ſea-brought coals. The market at Paddington, after an ineffectual and moſt extraordinary oppoſition from the city of London, was opened in May 1802, for the ſale of fat cattle, hay, ſtraw, corn, vegetables, &c. By the act 41 Geo. III., this company was authoriſed to lay pipes in certain ſtreets in Paddington, Mary-le-bone, &c. for ſupplying the inhabitants with water; but at that time, certain millers, whoſe dams the line had been made to paſs through, were not conſulted. In June 1801, packet-boats were eſtabliſhed, that continue to paſs regularly at ſtated hours during moſt of the year, for the conveyance of paſſengers and parcels between London and Uxbridge; and for ſome time after the opening of the Buckingham branch, a boat went regularly between Paddington and that town; but the number of paſſengers and parcels were found inadequate to ſupport the expence of ſuch an eſtabliſhment. Trading boats are not allowed to paſs along upon this canal except in the day time, unleſs ſuch as have a ſpecial licence from the company for ſuch purpoſe. Mr. *Pickford* has a great number of boats, which proceed as regularly day and night upon this canal, and the other canals north of it, as the mail-coaches do on the roads, although with leſs expedition. A common trading boat has been known to arrive at Paddington in 63 hours from Coventry. In December 1799, the experiment was firſt tried, of bringing fat Oxen to London in boats by means of this canal. The rates of *tonnage* on this canal were at firſt very low, as will be ſeen in *Phillips'* 4to. *Hiſtory*, *Appendix*, p. 91. Additional tolls were provided in the 43d of Geo. III. for paſſing the Bliſworth tunnel and Woolverton embankment; and by the firſt act of the laſt ſeſſions (45 Geo. III.), the rates on the whole line and branches were varied, and increaſed for ſhort diſtances. The act of the 33d provided certain rates, which are to be paid to the *Oxford* company (See *Phillips' Appendix*, p. 93.) for goods paſſing thereon to or from this canal, and this company is bound (ſince the beginning of 1804), to make up the ſame to the amount of 10,000l. per annum. This company is alſo bound to pay annually to the city of London the ſum of 600l. for the liberty of making a junction with the *Thames*; and all goods paſſing into or out of the ſame on this canal are to pay ½d. per ton, to be applied towards improving the middle navigation of the *Thames* river. The intended cut to Ayleſbury was, on account of the ſcarcity of water at Marſworth, where it was to join the line, changed for a rail-way, and in the year 1803, the ſame was begun; the iron rails were actually purchaſed, and brought to the ſpot, but, alas! in one of thoſe reverſes of favour to which borough towns are ever liable, the work was ſtopped, the rails were ordered to be ſold, and years may now perhaps elapſe before Ayleſbury is permitted to enjoy the advantage of a canal or rail-way communication. About the year 1793, an extenſion of the Rickmanſworth branch of this canal was propoſed to the town of Cheſham. In 1793, and again in 1802, it was propoſed to extend a branch from near Slapton to the foot of Puddle-hill between Dunſtable and Hockliff; one object of which was the export of the valuable white freeſtone from the quarries at Tottenhoe; this object may, however, it is preſumed, be obtained without ſuch cut; and ſtone of equal quality be got in ſeveral places on the ſummit branch. In the year 1802, the country weſtward of Uxbridge was ſurveyed by Mr. *John Holland*, with the intention of extending a branch of this canal from below Cowley lock, (continuing the level of the Paddington water) to the *Thames* at Harleford in Great Marlow pariſh; it was alſo propoſed, after croſſing and uniting with the *Thames* at this place, to extend this branch, by a riſe of three locks, to a ſide-cut of the *Kennet* river at St. Giles's in Reading, with a branch therefrom to the *Thames* at Sunning: the objects of this branch were, a more direct communication with the Briſtol channel, by means of the *Kennet and Avon* canal, the ſupply of the country bordering on this canal and its branches with peat manure from near Reading, the better ſupply of, and communication with London, by means of a canal without a lock, between the *Thames* at Great-Marlow, and Paddington, the gaining from the *Thames* that ſupply of water, which had been denied from the Colne for the intended water-works, and the lockage of the *London* canal; which was, in 1802, propoſed to extend from the baſon of this canal at Paddington to the *London Docks*, and thereby to communicate with the *Thames*; after which a *rail-way* was, in the ſame year, propoſed to extend from Paddington over nearly the ſame ground. It was before 1773 that a canal was firſt propoſed from Paddington to Uxbridge, nearly in the route of the line now accompliſhed; and in 1773, Mr. *James Sharp* propoſed an extenſion of this to the *Kennet* river. In June 1803, a ſurvey was taken for extending the intended Ayleſbury branch by Tame to the *Thames and Iſis* navigation, and *Wilts and Berks* canal near Abingdon. And in the ſame year, the *Leiceſterſhire and Northamptonſhire Union* canal was propoſed to be joined to the line of this canal at Long-Buckby wharf near Daventry, inſtead of joining its Northampton branch at that town.

Grand Surry canal. Act 41 Geo. III.—The general direction of this canal is nearly S.W. for about 12 miles, by a crooked courſe in the county of Surry, and through a ſmall part of Kent. It is not greatly elevated in any part: its objects are the ſupply of the neighbourhood through which it paſſes with coals, deals, manures, &c. the bringing of vegetables, and other articles for the ſupply of London: forming a communication between three points of the *Thames* river, and with the *Croydon* canal, which it joins near Deptford. It commences in the river *Thames* at Wilkinſon's gun-wharf in Rotherhithe, and is to terminate at the town of Mitcham; near Walworth a branch of about ¾ of a mile goes off to join the *Thames* at

Vauxhall creek by Cumberland gardens. There is to be a cut of near 1½ mile to Horſemonger lane; another of ½ a mile to Peckham; another of one mile to But-lane Deptford; another of ¼ of a mile to his majeſty's victualling office and the dock-yard at Deptford, and another of ⅓ of a mile into Greenland dock, by which it will again communicate with the *Thames* river.

From the river *Thames* to the junction of the *Croydon* canal the diſtance is 2 miles, and nearly level wich high water in the tide-way of the *Thames*, at which height the water is to be held up by tide or entrance locks; thence to the Vauxhall branch at Kennington common it is 3 miles and level; thence to Brixton-cauſeway, 1¾ mile, it has a conſiderable riſe; thence to the propoſed Kingſton branch, 4½ miles, it is level; and thence to Mitcham town it is ¾ of a mile: the Vauxhall, Horſemonger-lane, Peckham, But-lane, King's yard, and Greenland-dock branches, are all level. This canal is calculated for wide or river boats: near the commencement, at Wilkinſon's wharf, a large baſon is deſigned, and a ſmaller one at But-lane near the Greenwich road: acroſs Ruſhey-green to Brixton-cauſeway an inclined plane is intended. Mr. *Ralph Dodd* was, we are told, the contriver of this canal, and under his directions the works were begun, and conſiderable progreſs made between Rotherhithe and the Peckham branch; but for more than two years paſt, little further progreſs appears to have been made. The company were authoriſed to raiſe 60,000l. in 100l. ſhares. The tonnage on this canal varies from 2d. to 6d. per ton per mile on different kinds of goods. The company are to pay a rent of 60l. per annum to the city of London for communicating with the *Thames* river. Collateral cuts to the extent of 1500 yards may be made by conſent of the land owners. In 1800, it was intended to extend this canal 6½ miles further to the *Thames* river on the ſouth ſide of the town of Kingſton, which was to paſs the *Surry iron rail-way* at Merton abbey, by an aqueduct bridge 11 feet high in the clear, and the Wandle river by another 15 feet above its ſurface; from Norbiton common this was intended to branch again to the town of Epſom, 5½ miles, and from Mitcham the canal was there alſo propoſed to be extended to the town of Croydon. In the ſame year there was alſo a propoſal for extending the intended Kingſton branch to the *Wey* river (near the commencement of the *Baſingſtoke* canal), as part of one of the lines between *Portſmouth and London*. The *Croydon* canal company are to have a dock or baſon for their boats by the ſide of this canal near the *Thames* at Rotherhithe; which, with the entrance lock and baſon of this canal, are now excavating, and ſeem on a ſcale calculated for ſmall ſhips.

GRAND WESTERN CANAL. Act 36 Geo. III.—The general direction of this canal is nearly N.E. for about 35 miles, in the counties of Devon and Somerſet: it croſſes the ſouth-weſtern branch of the grand-ridge; its objects being a connection between the ſouthern coaſt and the Briſtol channel, the ſupply of the country with coals, deals, &c. and the export of farming produce. Exeter is the 21ſt Britiſh town, with a population of 17,398 perſons; Willington is the 73d, with 7,531 perſons; Tiverton the 94th, with 6,505 perſons, and Taunton, the 106th, with 5,794 perſons; Topſham, Bradninch, and Cullumpton, are alſo conſiderable towns near this line; which commences in the tide-way of the river *Exe* at the town of Topſham, and terminates in the *Tone* river at Taunton bridge; it has a cut of about ſeven miles to Tiverton, and other ſhort ones to Cullumton and Wallington. It is provided, that the brick bridges ſhall not have a riſe of more than 2½ inches in a yard on the aſcent of the road over them. Two reſervoirs are to be made in the valley of the Culm river, and two in the river Tone valley. Springs within 2000 yards of the line may be taken, and cuts to any place within five miles may be made by conſent of the land owners. The company are authoriſed to raiſe 330,000l., the amount of ſhares being 100l. each. We have not been able to learn that any progreſs is yet made in the cutting of this canal, although one through this line of country has been ſo long deſired, as appears by Mr. *Brindley*'s ſurvey for the *Exeter and Uphill* canal, that was propoſed in the year 1769.

GRANTHAM CANAL. Acts 33 and 39 of Geo. III.—The general direction of this canal is nearly eaſt, by a crooked courſe of 33¼ miles, in the counties of Nottingham, Leiceſter, and Lincoln: its eaſtern end is rather elevated. Its objects are the ſupply of Grantham and the neighbourhood through its courſe with coals, lime, deals, &c. and the export of farming products. Nottingham is the 17th Britiſh town, with 28,861 inhabitants; and Grantham the 85th, with 7,014 perſons; Birmingham is alſo a conſiderable town. This canal commences in the *Trent* river, near Holme-pierpoint, (almoſt oppoſite the *Nottingham* canal, to the *Trent* canal, and to the town of Nottingham,) and terminates at the town of Grantham; there is a branch of three miles in length to the town of Bingham. From the *Trent* river to Cropwell-biſhop, 6½ miles, is a riſe of 82 feet; thence to Stainwith-cloſes, 20 miles, is level; thence to Woolſthorpe point, 1¾ mile, is a riſe of 58½ feet; and thence to Grantham, five miles, is level: the cut to Bingham is level. This canal, which is through a clayey diſtrict, is wholly ſupplied by reſervoirs, of which, one at Denton is 20 acres, and nine feet deep, for ſupplying the head-level; and that at Knipton for receiving the flood waters of the Devon river, was 60 acres, and nine feet deep, and in 1804, the bank or head of this laſt was raiſed four feet higher. The company were authoriſed to raiſe 124,000l., the old ſhares being 100l. value each, and the new ſhares (200 in number) 120l. each. The tonnage on all goods paſſing to or from this canal and the *Trent* river is to be 2½d. per ton, and 1½d. per ton per mile for navigating on this canal: manures and road materials to paſs toll free, except lime-ſtone, which is to pay ¾d. per ton per mile. The *Newark and Bottesford* canal was at this time (1793) in contemplation to join this near Stainwith; and the tolls for entrance therefrom, or on goods paſſing into that intended canal, were ſettled in the firſt act above. The profits to the proprietors of this canal are limited to a dividend of 8 per cent. per annum, and after 3,000ls. are collected and depoſited as a fund, the above tolls are to be lowered, as much as circumſtances will admit. The *Trent* river proprietors are to take certain tolls on goods paſſing into or out of this canal to the *Nottingham* canal, in conſequence of their deepening the river near the entrances to theſe canals; and goods paſſing from this canal on the *Trent* are not to be liable to their new rates of 34 Geo. III. unleſs they paſs on the *Trent* canal, to be made under that act above Nottingham.

GRESLEY'S CANAL. Act 15 Geo. III.—The direction of this canal is about N.W., and level, in the county of Stafford: it is ſituate very near to the grand-ridge on its eaſtern ſide. Its objects are the ſupply of the town of Newcaſtle under-line with coals from Apdale collieries, and the export of coals from the mines to the weſt of it, by means of the *Newcaſtle under-line Junction* canal, which now joins it at each of its ends. This canal was conſtructed at the ſole expence of ſir Nigel *Griſley*, bart., who was bound by the act, for 21 years after 1775, to ſupply the inhabitants of Newcaſtle with coals at 5s. 6d. per ton of 2,400lb. or 3½d. by the ſingle cwt. (of 120lb.); and during the following term of 21 years, their price was not to exceed 6s. per great ton. In 1796, the *Commercial* canal was propoſed to connect with this canal at each end, as the *Newcaſtle under-line Junction* afterwards did in 1798.

Grimsby Canal. Act 36 Geo. III.—This canal has a S.W. direction for $1\frac{1}{2}$ mile, in Lincolnſhire: it is one of the largeſt cuts in England, and calculated to admit ſhips of 700 to 1000 tons burthen. It commences in the tide-way in the *Humber* river near its mouth, and terminates in the ſpacious wet-dock in Grimſby harbour. The lock to this canal is 126 feet long, 36 feet wide, and the walls are 27 feet high; the coſt of it, we are told, was 14,000l. beſides the piling for the foundation, although bricks were delivered there at 18s. 6d. per thouſand, and ſtone at 8d. per cubic foot. The depth of water in this canal is 20 feet: it was conſtructed under the direction of that able engineer Mr. *John Rennie*. In the year 1804, three acres more ſurface was excavated in addition to Grimſby wet-docks, and the ſame was re-opened, after a temporary interruption, on the 24th of July.

Hamoaze River. This river, or rather eſtuary, has nearly a north courſe for about nine miles, between the counties of Cornwall and Devon on their ſouthern coaſt: it is frequented by the largeſt ſhips of the royal navy. Plymouth is the 9th Britiſh town, with a population of 43,194 perſons; Plympton-Earle and Saltaſh are alſo conſiderable towns near this eſtuary, which commences in Plymouth ſound near Cawſand bay, and terminates in the river *Tamar* near St. Mellion. Near Warley the *Tavy* river falls into it; and Cat-water, Sutton-pool, and Stone-houſe creek, are branches from this eſtuary. In 1767, Mr. *John Smeaton* was conſulted about a new bridge and cauſeway over Stone-houſe creek. In 1801, it was in contemplation to build a pier from Pinlee point for the better ſecurity of ſhips lying in Cawſand bay from the E.S.E. winds. By an act of 45 of Geo. III. 4,000l. of the public money was voted towards cleanſing and deepening Cat-water and Sutton-pool; and it is now in contemplation to conſtruct a floating-dock in Sutton-pool capable of holding 100 merchants' ſhips always afloat.

*Hampton Gay and Iſleworth Canal.* In the year 1792, a canal was propoſed, to take a courſe nearly N.W. for about 60 miles, in the counties of Middleſex, Buckingham, and Oxford; commencing in the *Thames* river at Iſleworth, and terminating in the *Oxford* canal at Hampton-Gay. It was intended to effect that junction between the metropolis and the midland canals, which the *Grand-Junction* now accompliſhes: it was to paſs the chalk hills by a tunnel at Wendover, and to have a cut of three miles to Ayleſbury.

Hartlepool Canal. This is only a very ſhort cut of 300 yards in length, on the coaſt of Durham, from the ſea into Hartlepool harbour: it was cut in the year 1764, at the expence of ſir John H. *Duval*, through a ſolid rock, to the great depth of 19 feet. In 1796, Mr. *Ralph Dodd* propoſed, we are told, ſome improvements of this harbour.

Haslingden Canal. Act 33 of Geo. III.—The general direction of this canal is nearly north for 13 miles, in the county of Lancaſter; it is conſiderably elevated, croſſing the Haſlingden and Liverpool branch of the grand-ridge. Its objects are the export of the rich ſtores of coal, limeſtone, &c. on its courſe, and a communication between Mancheſter and the *Leeds and Liverpool* canal. Bury is the 84th Britiſh town, with a population of 7,072 perſons; Haſlingden is alſo a conſiderable town. It commences in the *Mancheſter Boulton and Bury* canal at Bury, and terminates in the *Leeds and Liverpool* canal at Church. No locks are to be built on this line, except by conſent of three-fourths of all the millers who occupy the ſtreams of water; it is intended to erect inclined planes. The company are authoriſed to raiſe 87,600l.; the amount of a ſhare is 100l. The tonnage upon all kinds of goods which do not paſs a lock or inclined plane, $1\frac{1}{2}$d. per ton per mile; coals, or other mineral products, are to pay 2d., and timber, goods, wares, &c. 3d. per ton per mile, if they paſs any lock or plane. Road materials (except for turnpike roads), and all manures, except lime, are to paſs free on the levels, and through the locks when water runs waſte over their weirs. Paſſage-boats are to be ſpecially licenſed by the company inſtead of paying tonnage. No wharfage is to be charged at the public wharfs, unleſs on goods remaining there above three weeks. We do not underſtand that much progreſs is made towards the completion of this canal.

*Headon and Paul Canal.* It is now (1805) in contemplation to form a canal from the *Humber* river at Paul to the town of Headon in Holderneſs, about three miles in the eaſt riding of Yorkſhire: its objects are the ſupply of Headon with coals and other articles, and the export of agricultural products.

Hereford and Gloucester Canal. Acts 31 and 33 of Geo. III.—The general direction of this canal is nearly N.W. for $35\frac{1}{2}$ miles, in the counties of Glouceſter and Hereford; the middle part of this canal is conſiderably elevated. Its object is the export of coals from the neighbourhood of Newent, and of the cyder and agricultural products of the country. Glouceſter is the 72d Britiſh town, with a population of 7,579 perſons; and Hereford, the 89th, with 6,828 inhabitants. Newent and Ledbury are alſo conſiderable towns on this line. It commences in the tide-way of the *Severn* river at Glouceſter, croſſes Alney Iſle, and another branch of the *Severn* to Laſſington, and terminates near the *Wye* river at Byſters-gate in Hereford; it has a ſhort cut to Newent. From the *Severn* to Ledbury the diſtance is 18 miles, with a riſe of $195\frac{1}{2}$ feet; thence to Monkhide is $8\frac{1}{2}$ miles on the ſummit-level; thence to Withington marſh it is three miles, with a fall of 30 feet; and thence to Hereford, ſix miles, it is level. Newent cut is level. On this line are three conſiderable tunnels, that at Oxenhal is 2192 yards in length; at Cannon-Frome is one of 1320 yards; and near Hereford, another of 440 yards in length. Mr. *Joſeph Clowes* is the engineer; in July 1796, this canal was finiſhed, from the *Severn* to Newent, and in March 1798, the Oxenhall tunnel was finiſhed, and the navigation extended to Ledbury, and coals were in conſequence reduced in price at that town from 24s. to 13s. 6d. per ton! The company were authoriſed to raiſe 55,000l. The prices of work in 1794, on this canal, 4d. per cubic yard for ſtages of 20 to 25 yards of wheeling: wheel-barrows were not uſed for moving ſtuff to greater diſtances than 100 yards; puddling coſt 6d. per cubic yard. The rates of tonnage are for coals 2d. per ton per mile; for manures, bricks, and rubble ſtone, lime or clay, 1d. per ton per mile; corn, meal, hewn ſtone, hops, wool, and other goods, 3d.: there are alſo particular rates for certain parts of the canal. The cut acroſs Alney Iſle, owing to the tide of the *Severn*, entering it from each end, and dropping its ſediment in the middle, is very liable to choak with mud. Springs or ſtreams of water within 3,000 yards of the line may be taken for the uſe of this canal.

*Hereford and Lydbrook.* In 1802, it was propoſed to conſtruct a *rail-way* from the *Wye* river near the bridge in Hereford to join the ſame river again oppoſite to Lydbrook.

**Heyl River**, (or *Hale.*) The courſe of this river or rather eſtuary is nearly ſouth for two miles, in the county of Cornwall, on its north-eaſtern coaſt: it commences in *St. Ives* bay, and terminates at the town of St. Erth: it is navigable only for ſmall veſſels, being almoſt choaked at the entrance of the bay. In 1766, Mr. *John Smeaton* was conſulted on the building of a north-eaſt pier at the entrance of St. Ives bay; the ſpring-tides here riſe 26 feet.

**Horncastle Navigation.** Acts 32 and 40 of Geo. III.—The general direction of this navigation is nearly N.E. for about 11 miles, in the county of Lincoln; it is not much elevated above the ſea: its objects are the ſupply of Horncaſtle and its neighbourhood with coals, deals, &c. and the export of agricultural products. Horncaſtle and Tatterſhall are conſiderable towns on this line. It commences in the old *Witham* river near Tatterſhall, and occupies the ſite of Dyſon's and Gibſon's former cut to Tatterſhall, paſſing that town to Horncaſtle by the courſe of the Bain river. The company were authoriſed to raiſe 45,000l., the amount of each ſhare being 50l. The dividends are not to exceed 8 per cent.; but after 1000l. is accumulated as a fund for contingencies, the tolls are to be lowered, to keep the profits within that limit. The firſt rates of tonnage are given in *Phillips's* 4to. *Hiſtory, Appendix*, p. 24, but theſe were varied and increaſed by the laſt act above. This company purchaſed the old Tatterſhall canal, and were, by their firſt act, to contribute jointly with the *Witham* and *Sleaford* companies in the expences, during the next ſeven years, in improving and deepening the courſe of the *Witham* between Lincoln high-bridge and the *Foſſe-dyke* canal, in order to facilitate the paſſage of goods to and from the *Trent* river, and in conſequence, but half the accuſtomed *Witham* dues were to be paid for goods paſſing to and from this navigation. In September 1802, this navigation, and the baſon at Horncaſtle, were completed and opened.

**Huddersfield Canal.** Acts 33 and 40 of Geo. III. The general direction of this canal is ſouth-weſt for 19½ miles in Yorkſhire and Lancaſhire; it croſſes the Grand-Ridge, at a great elevation, by one of the longeſt tunnels in this kingdom, in a rocky mountain: its objects are the carrying of coals that are found towards both its extremities, the ſupply of part of the country with lime, the conveyance of farming produce to the great towns, and the forming of a more direct communication between Hull and Mancheſter and Liverpool. Huddersfield is the 81ſt Britiſh town, with a population of 7268 perſons: Aſhton-under-line is alſo a conſiderable town. This canal commences in Sir John *Ramſden's* canal near Huddersfield, and terminates in the *Mancheſter Aſhton and Oldham* canal, at Duckenfield Bridge, near the town of Aſhton-under-line (near which the *Peak-Foreſt* canal alſo joins it). From *Ramſden's* canal to Marſden the diſtance is 7¼ miles, with a riſe of 436 feet; thence and through the tunnel to near Saddleworth it is 4 miles, and level; and thence to the *Mancheſter Aſhton and Oldham* canal, 8¼ miles, is a fall of 334 feet. The lock at the entrance from *Ramſden's* canal is 8 feet wide, this canal being only intended for narrow and long boats. The Tunnel through the Stannage Hills near Marſden is to be three miles in length, near to which, on the ſummit-level, the company are authoriſed to make reſervoirs to contain 20,000 lock-falls of water, (each 180 cubic yards), and may make others if theſe prove inſufficient. About the year 1798, that part of the line between Huddersfield and Marſden was completed and opened; in the ſame year the head of a large reſervoir near Marſden broke, and the torrent of water let down thereby did conſiderable damage to the country below it. The company are authoriſed to raiſe 274,000l., the amount of ſhares being 100l. Theſe became greatly depreciated in value, about the year 1800, owing principally, it is ſuppoſed, to many of the original ſubſcribers not being able to anſwer the calls for money, by which the works were retarded, and the canal remained in an unproductive ſtate: the Tunnel under the Stannage Hill is now proceeding. The rates of tonnage are from ½d. to 3d. per ton per mile for different goods, (ſee *Phillips*'s 4to. *Hiſtory, Appendix*, pp. 135, 136.) beſides which 1s. 6d. per ton is to be paid extra, on all goods which paſs through the tunnel; leſs lading than 15 tons is not to paſs any lock, unleſs the water runs waſte thereat, without conſent; no rates are to be taken by Sir John *Ramſden* for the goods which paſs between his warehouſes at Huddersfield and this canal, this company to amend and keep that part of his canal in repair, in conſequence, and are to guarantee his tolls not being leſſened, taking an average of three years before this canal is cut. This company is alſo bound not to make any branch or extenſion of the canal to any other navigation to the eaſtward; but, in ſuch caſe, the tolls thereof are to be divided between *Ramſden's*, the *Calder and Hebble*, and *Ayre and Calder* proprietors, inſtead of being taken by this company.

**Hull River.** The courſe of this river is nearly north for about 12 miles, in the Eaſt Riding of Yorkſhire; it is but very little higher than the ſea; its objects are the ſupply of Beverley and the adjacent country with coals, deals, &c. and the ſupply of Beverley and Hull with farm produce. Kingſton-upon-Hull (or Hull) is the 16th Britiſh town, with 29,516 inhabitants; and Beverley is the 100th, with 6001 perſons. This navigation commences in the tide-way of the *Humber* at Hull, and terminates in the *Driffield* navigation upon the ſame river at Aike-beck mouth. In Leven pariſh (between Eſke and Leven-bars) this is joined by the *Hull and Leven* canal.

**Hull and Leven Canal.** Acts 41 and 45 of Geo. III. The courſe of this canal is nearly eaſt for about three miles, in the Eaſt Riding of Yorkſhire; it is in a very low ſituation; its objects are the ſupply of Leven town, of lime to the country eaſt of it, and the export of the agricultural produce thereof for the ſupply of Hull and Beverley. It commences in the *Hull* river, and terminates at Leven bridge. Mrs. *Charlotte Bethel* is the ſole proprietor of this canal, on which Mr. *John Rennie*, Mr. *William Jeſſop*, and Mr. *James Creaſſy* were conſulted. This canal was finiſhed ſome time ago; and the act of laſt ſeſſion was for raiſing the tolls, which were found diſproportionate to the expence of its conſtruction and management.

**Humber River.** Act 23 Henry VIII.—This noble river, or rather eſtuary, has nearly a weſt direction for about 40 miles between the counties of York and Lincoln. The tide flows with great rapidity through its whole length, and the depth of water is ſufficient for ſhips of conſiderable burthen, which trade in vaſt numbers to the port of Hull, and with the numerous eaſtern rivers which connect with it. Hull contains, as above ſtated, 29,516 inhabitants; and Barton is the 96th Britiſh town, with 6197 perſons. Grimſby, Pattrington, Headon, and Burton are alſo conſiderable towns on or near to this river. It commences in the German Ocean at the Spurn Head, and terminates in the *Ouſe* and the *Trent* rivers, at their junction at Trent-fall: it is joined at its mouth, near Tetney, by the *Louth* river; at Grimſby, by the Grimſby canal and docks; at Kingſton-upon-Hull, by the ſpacious Hull docks and by the *Hull* river; in Wintringham, by the *Ancholme* river; and at Foſs-dyke Clough, near Flaxfleet, by the *Market-Weighton* canal. The port of Hull, and the accommodations of this river, have been greatly improved, by the conſtructing of wet-docks at Hull; the acts 14, 42, and 45 of Geo. III. having paſſed for theſe purpoſes, the firſt dock was opened in September 1778. In 1800, the new Humber-dock was propoſed, from Myton-gates to Heſſel-gates, on the ſite of the old ramparts, to form ſeven acres of water, to which a 50 gun ſhip may have acceſs from the *Humber*, and 70 ſail of ſhips may lie conſtantly afloat, to be ſurrounded in part by ſpacious warehouſes. By the act for the ſame, 30,000l., in 100l. ſhares, was to be raiſed: theſe ſhares have ſince borne a premium of near 50 per cent. The act of the late ſeſſion was for raiſing more money to complete this vaſt undertaking, now in great forwardneſs. In September 1802, a ſmall dock was begun on the ſhore of the *Humber* for market and ferry boats; a number of dolphins or floating buoys were, about the ſame time, placed on the banks of the river. In 1774, Mr. *John Smeaton* was employed to build two light-houſes on the Spurn Head, at 300 yards apart, which, in June 1776, were in imminent danger of having their foundations undermined by a great ſtorm: in September 1803, the loweſt of theſe light-houſes was burnt down by accident. Coal-ſhips, paſſing the *Humber*'s mouth for the London market, pay 1d. on each chaldron of their cargo, towards the ſupport of theſe lights. In 1800 it was in contemplation to erect a light-houſe at Stallingborough, on the ſouth ſhore of the *Humber*. In 1802 the *Cottingham and Hull* canal was propoſed, to connect with this river at Hull; in the ſame year, the *Keyingham-Level* navigation was propoſed to join at Stone-creek. In 1805 the *Headon and Paul* canal was propoſed to connect with it at Paul.

Idle River. The courſe of this river is nearly weſt for about 10 miles, in Nottinghamſhire: it commences in the *Trent* river at Stockwith, (near to the termination of the *Cheſterfield* canal,) and terminates at the town of Bawtry. At half a mile from the *Trent* is Miſterton ſas or ſluice, with an opening of 17⅔ feet, and two lock-doors 16 feet high, opening towards the *Trent*, to keep the floods thereof out of the low lands through which this river paſſes. In 1764, Mr. *John Smeaton* was conſulted on this navigation and drainage.

Inverness and Fort-William Canal. Acts 43, 44, and 45 of Geo. III.—This grand or *Caledonian* canal, as it is ſometimes called, has nearly a ſouth-weſt direction for 59 miles, in Inverneſs and Argyle ſhires, in the Highlands of Scotland; it paſſes the Grand-Ridge, through a low part thereof, interſected by deep lakes or lochs: its object is a connection between the Eaſt and Weſt Seas, by Linnke Loch and Murray Firth, for large ſhips drawing near 20 feet of water, and for avoiding the northern voyage by the Orkneys, or through *Pentland Firth*. Inverneſs is the 63d Britiſh town, with a population of 8732 perſons. Nairn, Cromarty, and Fort-George are alſo conſiderable towns on this line. It commences in the tide-way in Loch *Beauly* at Clachnacarry baſon, and, after paſſing through two large and two ſmall inland lakes, it terminates in the tide-way in Loch *Eil* at Corpach baſon. From the ſea-lock at Clachnacarry to the 2d lock, about ¾ of a mile, it is level, with high water in Loch *Beauly*, and nearly parallel thereto; thence for one mile to the 6th lock is a riſe of 45 feet by 5 locks; thence through Lochs Doughfour and Neſs to Fort Auguſtus is 28 miles, and level; thence to the eaſt end of Loch Oich at the 13th lock, 5½ miles, is a riſe of 53 feet by 7 locks; thence through Loch Oich, and the deep-cutting on the grand ridge weſt of it, is 54 miles and level; at the end of which the lock N° 12, at the eaſt end of Loch Lochy, makes a fall of 19 feet; thence through Loch Lochy to near Tor Caſtle is 16¼ miles, and level; and thence to the ſea-lock at Corpach, 2¼ miles, is a fall of 70 feet by 10 locks: in all 23 locks, beſides the ſea or entrance locks. This canal is 110 feet wide at top, 50 at bottom, and 20 feet deep; the locks are 152 feet long and 38 feet wide. At Clachnacarry and at Corpach are baſons, each 400 yards long and 70 yards wide. Twenty-two miles of this navigation is through a ſurpriſing freſh-water lake, called Loch Neſs, of ¾ to 1¼ mile in breadth, the middle part being 120 fathoms in depth! and its bottom muddy: this loch and the next never freeze, and it is ſaid that the waters thereof do not corrode iron. Loch Lochy is another large lake, 10½ miles in length, and from ¾ to 1¼ mile in width, and its greateſt depth 76 fathoms, through which this navigation paſſes: it has a ſecure little harbour, 200 fathoms long and 150 fathoms wide, at its eaſtern end. Another ſmaller lake is found on this line, called Loch Oich, 3½ miles long, from $\frac{1}{16}$ to ½ of a mile wide, and 26 fathoms in depth in the deepeſt part, its bottom being a ſoft mud. Loch Doughfour, the remaining one of the four, is 1¼ mile long, about ¼ of a mile wide in its wideſt part, and about 40 feet deep. The number of ſwing bridges is 25; there are 5 culverts with 1 to 4 arches each, and an aqueduct bridge of 4 ten-feet arches at Ley Bridge: the deep-cutting near Laggan is to be 45½ feet deep on the ſummit, and is eſtimated to coſt 11,262l. New courſes are required to be cut for the river Spean, and at Fort Auguſtus for the river Neſs; the ſteep hills adjoining, rendering it neceſſary for the canal to occupy the old bed of the river for ſome diſtance in thoſe places. A large weir is to be made at the eaſt end of Loch Doughfour, to hold up its waters to the level of Loch Neſs, and ſeveral ſmaller weirs are to be made. Loch Oich is to be deepened 1540 yards in length, at the expence of 11,550l. This canal is moſt amply ſupplied with water on the ſummit, not only for the lockage, but for the working of mills out of the different pounds, which will doubtleſs hereafter prove of immenſe advantage to the country. In 1774 Mr. *Watt* was employed to ſurvey this line, who eſtimated a 12 feet deep canal, in the place of the preſent one, to coſt 164,031l., excluſive of the land. In 1801 Mr. *Thomas Telford* was employed by Government to ſurvey the canal above deſcribed, aſſiſted by Mr. *Murdoch Downie*, very full particulars of which will be found in the *Reports*, printed by order of the houſe of commons 14th June 1803 and 10th of April 1804; in which Mr. *William Jeſſop*'s eſtimate, amounting to 474,531l. (excluſive of 23,000l. for land and mooring-chains) is given; and walled locks are recommended, on account of the loſs of time in filling the chambers of thoſe unwalled. By the firſt act above, 20,000l., by the next 75,000l., and by the laſt 50,000l. of the public money were granted, for carrying on this great work, under the direction of Mr. *Thomas Telford*. In October 1804, ſeven miles in length next Inverneſs were digging, and the entrance baſons were in hand. In Auguſt 1805, the new channel for the river Neſs was cutting, the firſt lock new Inverneſs was building, 1000 men being employed at this end. It is propoſed to place mooring chains on the ſhores of Lochs Neſs and Lochy, on account of their being too deep for good anchorage. On Loch Neſs government have had a galley of 37½ tons burthen ſince 1727, in which period, to 1803, five of them had been worn out: the worm ſo fatal to wood in ſome waters is not troubleſome here. At Inverneſs the ſpring tides riſe 11 to 15 feet, and the neap tides 7 feet; at Fort William they riſe 12 and 5 feet. Cromarty Bay in Murray Firth, about 18 miles eaſt of the beginning of this canal, was ſurveyed by Mr. *Thomas Telford* in 1801; the ſpring tides here riſe 14 or 15 feet, and the two piers of this harbour appear to offer a ſafe retreat for ſhips, ſecure from every wind, and where warehouſes are only wanting for the accommodation of a large fleet.

Itching River. Acts 16 and 17 of Cha. II., and 7 and 35 of Geo. III.—The general direction of this navigation is nearly north, for about 14 miles, in Hampſhire; it is but little elevated above the ſea; its objects are the ſupply of Wincheſter with coals, deals, &c. and of Southampton with flour and other agricultural products, and the trade between theſe towns. At Northam it is joined by the *Southampton and Saliſbury* canal. Southampton is the 68th Britiſh town, with a population of 7913 perſons; and Wincheſter the 103d, with 5826 perſons. It commences in the tideway in *Southampton Water* near Southampton, and terminates at Wincheſter. This navigation is the ſole property of *James D'Arcy*, Eſq.; and he and his predeceſſors were the ſole carriers, or nearly ſo, thereon, until 1795, when commiſſioners were named, in the above act, for fixing rates of tonnage, on payment of which it is in future to be a free navigation. It was intended to widen the channel between Woodmill and the Roman ditch, and to erect pound-locks where neceſſary.

Ivel River. Act 30 Geo. II.—The direction of this river is nearly ſouth, for about 11 miles, in the county of Bedford; it is not very greatly elevated; its objects are the ſupply of the towns of Biggleſwade, Shefford, and the adjoining country, with coals, deals, &c. and the export of farm produce. It commences in the great *Ouſe* river at Temsford, and terminates at the town of Shefford. On the lower end of this navigation, ſluices with ſeparate and moveable upright planks inſtead of gates are in uſe, as before mentioned. Soon after the paſſing of the act, the navigation was completed to Biggleſwade; but the remainder of the diſtance to Shefford, $5\frac{1}{4}$ miles, has not yet been made navigable, for want of money. In the preſent year (1805) Mr. *Benjamin Bevan* was employed to ſurvey and eſtimate the expence of this part, which he ſtates at 5900l.; the riſe about 26 feet, to be effected by 5 locks; the toll on this diſtance is to be 1s. 6d. per ton. It is ſtated that the part of this navigation below Biggleſwade has, in the laſt ſeven years, produced a net 400l. per annum, towards the reduction of the debt at firſt incurred. Several years ago the *Biggleſwade and Hertford* canal was propoſed to join this river at Biggleſwade.

Ivelchester and Langport Canal. Act 35 Geo. III.—The direction of this navigation is nearly eaſt for about 7 miles in the county of Somerſet: it is not much elevated: its objects are the import of coals and export of farming products; Langport and Ilcheſter, or Ivelcheſter, are conſiderable towns; it commences in the *Parret* below the town of Langport, and terminates at the town of Ilcheſter, following the courſe of the Yeo river part of the way, and the remainder by a canal; the company were authorized to raiſe 8,000l., the amount of ſhares being 50l. each: half-mile ſtones are to be erected on this navigation.

Kennet River. The courſe of this river is nearly eaſt for about 20 miles in the county of Berks, it has a conſiderable elevation: its objects are the ſupply of Newbury, the export of farming products, and forming part of the moſt direct communication between London and Bath and Briſtol; Reading and Newbury are conſiderable towns. It commences in the *Thames* river about a mile below Reading, and terminates in the *Kennet and Avon* canal a little above Newbury; on this navigation unwalled locks were very early in uſe; in Feb. 1800 it was propoſed to improve this navigation through the borough of Reading. This company has given notice that as carriers, they will not be anſwerable for the damage goods may ſuſtain by fire or unavoidable accidents. Immenſe beds of Peat are found near Reading, which is uſed for conſiderable diſtances as a manure.

Kennet and Avon Canal. Acts 34, 36, 38, 41, and 45 of Geo. III.—The general direction of this canal is nearly eaſt for $55\frac{1}{2}$ miles in the counties of Somerſet, Wilts, and Berks. The middle part is conſiderably elevated, and croſſes both the weſtern and eaſtern branches of the grand-ridge, the part between theſe points, croſſing the heads of the valleys which fall to the ſouthern coaſt, while the ends are in thoſe vales falling to the *Briſtol Channel* and the *Thames;* its objects are a communication between Briſtol, Bath, and London, and the ſupply of the country weſt of Hungerford with coals from the mines connected with the *Somerſetſhire Coal* canal, which joins at Monkton Combe; at Widford it connects with the *Dorſet and Somerſet* canal, and at Semington with the *Wilts and Berks* canal. Bath is the 12th Britiſh town, with 32,200 inhabitants; Devizes is the 69th, with 7,909 perſons; Bradford the 78th, with 7,302 perſons; and Trowbridge the 104th or 105th, with 5,799 perſons; Melkſham, Hungerford, and Newbury, are alſo conſiderable towns on or near this canal. This canal commences in the *Avon* river at Dole-Mead in Bath, and terminates in the *Kennet* river a little weſt of Newbury; the branches that were at firſt propoſed to Calne and Chippenham, have been ſuperſeded by the *Wilts and Berks* canal, and its branches. From the *Avon* to near Bathampton $\frac{3}{4}$ of a mile is a riſe of $56\frac{1}{2}$ feet; thence to Trowle bridge, $10\frac{1}{2}$ miles is level; thence to Devizes, $9\frac{1}{4}$ miles, is a riſe of $30\frac{1}{2}$ feet; thence for 20 miles along the ſummit-pound (and through the tunnel of $2\frac{3}{4}$ miles, at firſt propoſed) to Crofton; thence to Hungerford is ſix miles, with a fall of 104 feet; and thence to the *Kennet* near Reading, 9 miles, is a fall of 72 feet. By the ſecond act, the company were authoriſed to raiſe a part of their ſummit-pound at its eaſtern end, ſo as to paſs the ſummit by a moderate deep-cutting inſtead of the tunnel above mentioned, and to ſupply the new ſummit with water by a large ſteam-engine. This canal is calculated for 50 ton boats; at Trowbridge there is a baſon 129 yards long and 60 wide, and another between Lyncombe and Widcombe. There is a conſiderable deep-cutting near Burbage: there are two large ſtone aqueduct bridges over the *Avon* river, one called Dundas, the other is at Avon-cliff. Progreſs was firſt made in completing parts of this canal at its eaſtern end, and in October 1798, the ſame was opened from Reading to Hungerford; in July 1799 the ſame was opened to Great Bedwin, near the beginning of the ſummit: in May 1801, the other end of the line was opened from Bath to Devizes. The company were authoriſed to raiſe 810,000l. beſides a farther ſum by the laſt act; the original ſhares were 120l. each, but a great number of defaulters appeared among the ſubſcribers, (no leſs than 450 ſhares it was ſaid) and thoſe remaining being called on for 17l. 4s. $7\frac{1}{2}$d. on each, made the amount of theſe old ſhares 137l. 4s. $7\frac{1}{2}$d. each, before the act of 41 Geo. III. reſtrained any further calls on their ſhares, and created a new ſet of ſhares of the amount of 60l. each. The ſhares of ſeveral diſcontented proprietors were directed to be purchaſed. This canal paſſes through Sydney-gardens near Bath, which are laid out and appropriated to pleaſurable parties like our Vauxhall gardens. The rates of tonnage are from 1d. to $2\frac{1}{2}$d. per ton per mile on different goods, and others are fixed for the diſtance between Bath and Devizes, for which ſee *Phillips's* 4to. *Hiſtory, Appendix,* pages 142 and 143. Mr. *John Rennie* is the engineer, whoſe ſuperior ſkill has been ſhewn in ſurmounting the great difficulties that have attended the conſtruction of this canal: between Avon-Cliff and Bradford, a ſingle ſlip coſt, it is ſaid, 1000l. repairing. A canal paſſing through nearly this tract of country was propoſed in 1754. The new ſhares in 1802 bore a premium, notwithſtanding no intereſt is to be received on them until the line is completed, which was required by the firſt act to be done in the next year, (1806); we ſincerely wiſh this may be the caſe. Some years ago it was propoſed to extend a branch of the *Baſingſtoke* canal to join this at Hampſtead: in 1796 there was an intention of extending this canal by the ſide of the *Avon* to Briſtol.

KETLEY CANAL. The general direction of this canal, or water-level, is about E.; originally it was about 1½ mile in length, in the county of Salop; it has a great elevation, being within 7 or 8 miles of the grand ridge on its weſtern ſide; its objects are the conveyance of coals, iron-ore, and lime-ſtone, the export of heavy iron goods, &c.; it was contrived by Mr. *William Reynolds*, and cut in 1788 at the ſole expence of Meſſrs. *William Reynolds and Co.* and in the year 1793, 1 mile and 188 yards of this level at its eaſt end were ſold to the *Shrewſbury* company, and made part of their canal; the price was 840l. half the original coſt, with the condition that Meſſrs. *Reynolds and Co.* ſhould pay 2d. per ton per mile for their goods paſſing on the *Shrewſbury* canal. This canal now, therefore, conſiſts of about three furlongs of level connecting with the *Shrewſbury* canal, at the head of the Wom bridge inclined-plane, and having at its other extremity an inclined plane of 73 feet perpendicular fall to the Ketley iron-works; this inclined plane was the firſt that was brought into practice in England for the paſſage of boats, and in 1789 a copper medal or half-penny was ſtruck to commemorate the ſame. The boats uſed hereon are 20 feet long, 6½ feet wide, and 3 feet 10 inches deep, carrying 8 tons; they are floated into a ſhallow lock at the top of the plane in order to place them upon the wheeled carriage or cradle, which carries them down the plane, after the water in the lock is drawn off into a ſide-pond, to be pumped up again by a ſteam-engine into the upper pound, and by which no water is loſt out of the upper pound or water-level. The inclined plane is double, and a deſcending loaded boat draws up an empty one or but about one-third laden, by means of ſtrong ropes winding round a barrel at the head of the plane, the velocity being regulated by a brake-wheel; of this plane we have before ſpoken. Several of theſe ſmall boats linked together are towed along the level by one horſe, and to guide them round the projecting turns of the bank, ſlide-rails are placed thereon.

*Keyingham-Level.* In the year 1802, Mr. *William Chapman* made a ſurvey for a navigation, and drainage-cuts, from the *Humber* river at Stone-creek, to Rooſs-bridge and Owſtwick-carr gate, in the Eaſt-Riding of Yorkſhire, the eſtimated expence thereof being 1500l.; the canal was propoſed to paſs near the town of Keyingham, its objects being the import of coals, &c. and the export of agricultural articles.

KIDWELLY CANAL. The length of this canal is about 3½ miles, in Caermarthenſhire, in South Wales, it is the private property of Mr. *Keymer*; it extends from the tide-way at the town of Kidwelly to Mancha coal and lime-works, belonging to Mr. Keymer, through whoſe eſtate the canal is alſo cut: its object is the export of lime and coals.

LAGAN NAVIGATION, (*Ireland*). This is one of the navigations which the Iriſh parliament have aſſiſted with ſums of money, with the view of facilitating the working of the collieries with which it connects; for this navigation and its collieries, various ſums of public money were advanced between 1753 and 1770, amounting to 40,304l.

LANCASTER CANAL. Acts 32, 33, 36 and 40 of Geo. III.—The general direction of this canal is nearly S. for 75¾ miles, in the counties of Weſtmoreland and Lancaſter; the greater part of its northern end ſkirts along near the ſea-coaſt, but the ſouthern end is conſiderably elevated, croſſing within two miles of its termination the Haſlingden and Liverpool branch from the grand-ridge. Its objects are, the interchange of the lime-ſtone of the northern parts, for the coals and cannel of the ſouthern parts of the line, the ſupply of Lancaſter and Preſton, &c.: it is to connect with the ſea at Glaſſon Dock by a cut of 4 miles from Galgate on the line of the canal; it croſſes the *Loyne* and *Ribble* rivers, but without connecting with them, and it likewiſe paſſes under the *Leeds and Liverpool* canal. Preſton is the 37th Britiſh town with 11,887 inhabitants, Wigan is the 42d, with 10,989 perſons, Lancaſter the 56th, with 9,030 perſons, and Kendal is the 88th, with 6,892 perſons; Burton, Garſtang, Kirkham, and Chorley are alſo conſiderable towns on this line. This canal commences in a baſon at Kirkby-Kendal, and terminates in another at Weſt Houghton: to Wharton-Craggs lime-works there is to be a cut of 2½ miles, and another of 2⅞ miles to Duxbury near Chorley. From the baſon at Kendal to Greenhead farm (through the Hincaſter or Leven tunnel) is 5⅛ miles and level; thence to near Borwick, (near the Wharton branch) 9¾ miles, is a fall of 65 feet; thence to the ſouth ſide of the meadows ſouth of Preſton is 42⅝ miles and level! thence to Clayton Green 3⅛ miles is a riſe of 222 feet, and thence to Weſt Houghton 15⅝ miles is level; the Wharton and Duxbury cuts are level. This canal is 7 feet deep, the boats are 56 feet long and 14 feet wide, carrying 60 tons; and the Glaſſon branch has a fall of about 52 feet. There are two tunnels, one at Hincaſter near Leven's Park of about 800 yards long, and another through the Whittle Hills near Chorley, which proved a moſt difficult one to execute; at Aſhton near Lancaſter there is an amazing piece of deep-cutting. At Lancaſter there is a moſt ſurpriſing aqueduct bridge 51 feet high, over the *Loyne* river, conſiſting of 5 arches of 70 feet ſpan each. (See our article BRIDGE.) There are other aqueducts over the *Ribble* at Preſton, the Wyre at Garſtang, the Beeloo near Bethorn, &c.; and it is paſſed on an aqueduct 60 feet high near Bark-mill not far from Wigan by the *Leeds and Liverpool* canal. At Kendal the canal is ſupplied with water by a feeder of 1 mile in length from the river Mint: water from all mines within 200 yards may be taken. The part of the line between Wheelton (near to Clayton Green) and the ſouth end of the long level is at preſent ſupplied with a rail way, but we believe only as a temporary meaſure. Mr. *James Brindley* was employed in 1772 to ſurvey a part of this line, the whole of it was ſoon after ſurveyed by Mr. *Robert Whitworth*, and in 1791, Mr. *John Rennie* was employed, who has had the direction of the works upon it, which will redound to his laſting credit. The company is authoriſed to raiſe 414,000l. in 100l. ſhares, and 200,000l. more in ſhares of 30l. each. In July 1796, the laſt arch of the Lancaſter aqueduct was completed: in September 1805, it was ſtated that the ſhares divided 1l. per cent. From Bolton to Lancaſter and thence to Preſton it was opened in November 1797, and in a few years after the whole of the long level was completed. In June 1803, the Whittle tunnel was completed, and 1½ mile of the rail-way, ſo that coals paſſed from Weſt Houghton to Bramber-bridge, and in 1805, the remainder of the rail-way was opened for conveying coals to Preſton, Lancaſter, &c. At Heſt this canal paſſes along cloſe to the ſea beach. The rates of tonnage are, for coals 1½d. per ton per mile; for lime-ſtone, ſlate, ſalt, bricks, ſtone, iron-ore, gravel, ſand, clay, and manures ½d. per ton per mile; for lime and iron 1d. per ton per mile, and for timber, wares, and merchandize, 2d. per ton per mile. Coals are not to paſs the intended locks N. of Chorley under 2s. 3d. per ton, which is to paſs them for 18 miles N. of Chorley. It is provided in the *Ulverſton* canal act (33 Geo. III.) that coals from this canal may croſs the bay of Morecambe to that place without being ſubject to the ſea duty.

LARK RIVER. This river (ſometimes called the Mildenhall) has its courſe nearly S. E. for about 22 miles in the county of Suffolk, after ſkirting the bounds of Cambridge for ſome miles. Bury St. Edmunds is the 71ſt Britiſh town, with a population of 7,655 perſons; Mildenhall is alſo a conſiderable town on the line of this navigation, which commences in the great *Ouſe* river at Prick-willow, (about 4½ miles below Ely) and terminates at Bury St. Edmunds. Its objects are the import of coals, deals, &c. and the export of farming products. The lower part of its courſe is embanked on both ſides through the fens. It is generally very ſhort of water in the autumn. In 1789, this river was propoſed to be croſſed by the *Biſhopſtortford and Wilton* intended canal; and in 1802 it was propoſed to be joined at Bury St. Edmunds by the *Stowmarket and Bury* rail-way.

LEA RIVER. Acts 12 Geo. II. and 7, 19, and 45 of Geo. III.—The general direction of this river is almoſt north for about 28 miles, between the counties of Middleſex and Eſſex and in Hertfordſhire; it is not much elevated. Its objects are the ſupply of Hertford and all the ſurrounding country with coals, deals, &c. and the export of farming products, of which malt from Ware forms a conſiderable part. At Bromley near Bow it connects with the *Limehouſe* canal, and near Hoddeſdon it is joined by the *Stort* river. Hertford, Ware, Hoddeſdon, Waltham-Abbey, Enfield, and Stratford are conſiderable towns on or near this navigation. It commences in the *Thames* river at Bow-Creek near the *Eaſt-India Docks*, and terminates in the town of Hertford: it has a ſhort cut to the town of Waltham-Abbey. This river, which ſeems ſubject to floods, was originally made navigable in ſome places by weirs and fluſh-ſluices, or turnpikes. In 1767, Mr. *John Smeaton* calculated one of thoſe ſluices to let down 1429½ cubic feet of water per minute on an average, a conſumption which greatly injured the mills; the early pound-locks erected on this river were without walled chambers. In 1771 ſome of the turnpikes were removed and locks built; in 1781, Mr. *Smeaton* was again called in to give an opinion on the very leaky ſtate of the locks. In 1772, and again in 1802, this river was propoſed to be joined at Waltham-Abbey by the *London and Waltham-Abbey*, with another junction therewith at Lee-bridge; and in 1792, it was propoſed to be joined at Hertford by the *Leiceſter and London* canal. Several years ago the *Biggleſwade and Hertford* canal was propoſed to join this river at Hertford. Between Hertford and Ware, the *New River* or aqueduct for the ſupply of London, has its riſe, partly out of the chalk hills, and partly by a feeder out of this river, and purſues its devious courſe for near 40 miles. This great work was begun by Sir *Hugh Middleton* in 1608; in 1773, Mr. *James Sharp* ſuggeſted the making of the New River navigable, and continuing it by a level cut to the *Thames* near Reading. In 1803, Mr. *John Rennie* was employed by government to ſurvey the lower part of the courſe of the *Lea* river, and to conſtruct embankments acroſs, for filling this extenſive vale with water in caſe of an invaſion: the gates intended to produce theſe effects, are veſſels that can on the ſhorteſt notice be floated to and ſunk in their proper places, to ſtop the water, as before deſcribed.

*Leatherhead and Thames Rail-way.* In 1801, it was propoſed to make a rail-way from a baſon to be made on the banks of the *Thames*, in Weſt Moulſey (oppoſite Sunbury) to the town of Leatherhead in Surry, through the pariſhes of Walſton, Cobham, Stoke-Dawbernon, Little Bookham, Great Bookham and Fetcham.

LEE RIVER, (*Ireland.*) For improving the navigation of this river, the Iriſh parliament between 1753 and 1772, granted 2,000l. of the public money.

LEEDS AND LIVERPOOL CANAL. Acts 10, 23, 30, and 34 of Geo. III. The general direction of this canal is between N. E. and E. by a very crooked courſe of 130 miles in the counties of Lancaſter and York; it croſſes the grand-ridge by a tunnel, near Colne, and at Red-Moſs and Aſpule croſſes the Haſlingden and Liverpool branch of the grand-ridge. Its objects are a communication between the ports of Liverpool and Hull, the export of the immenſe ſtores of coals, cannel, and lime-ſtone, that are found on parts of its courſe, and the ſupply of the great towns thereon with the agricultural products of the intermediate country. At Brier's-mill it connects with the *Douglas* navigation (now belonging to this company, by a purchaſe under 23 Geo. III.); near Bark-mill not far from Wigan it croſſes the *Lancaſter* canal (but is 60 feet above it on an aqueduct-bridge.) At Church it connects with the *Haſlingden* canal, at Skipton with *Thanet*'s canal, and at Windhill with the *Bradford* canal. Liverpool is the 4th Britiſh town with 77,653 inhabitants; Leeds is the 8th, with 53,162 perſons; Blackburn is the 36th, with 11,980 perſons; Wigan is the 42d, with 10,989; Bradford is the 95th, with 6,393 perſons, and Hunſlet the 104th or 105th, with 5,799 perſons: Ormſkirk, Chorley, Burnley, Colne, and Skipton are alſo conſiderable towns on or near this line; which commences in the town of Liverpool (on the bank of the *Merſey*, but does not connect therewith, and terminates in the *Ayre and Calder* navigation in the town of Leeds; there is a cut to Ighton-hill collieries, another to Mr. Walton's Altham collieries; and proviſion is made for cuts to be made by the earl of Balcarras and Mr. Shuttleworth between their coal-works and the line. The old baſon at Liverpool is 52 feet above low-water mark in the *Merſey* river, from thence to Newborough, 28 miles, is level; thence to the beginning of the deviation that was laſt made in the line, near to the town of Wigan, 7 miles, is a riſe of 30 feet, by 5 locks, (this laſt length being ſometimes called the *Upper Douglas* navigation, of which it formerly was a part), thence to Bradſhaw-hill near Aſpule 3 miles, has a riſe of 279 feet, by 28 locks, (the *Lancaſter* canal being croſſed in this diſtance) thence to the aqueduct over the Derwent near Blackburn, 19¼ miles, is level; thence to Grimſhaw near Blackburn, ¾ of a mile, has a riſe of 54¼ feet, by 7 locks; thence to the end of the deviation at Barrowford near Colne is 24 miles and level; and thence to the beginning of the ſummit pound near Colne is ¾ of a mile with a riſe of 67¾ feet, by 7 locks. The ſummit-pound, paſſing through the Foulridge tunnel, extends to near Thornton, about 6¾ miles and level; thence to Holme-bridge near Gargrave is about 7½ miles, with about 150 feet fall, by 15 locks; thence to Gawthorpe-hall near Bingley is 17 miles and level; thence to the junction of the *Bradford* canal is about 4 miles and 100 feet fall by 11 locks; and thence to the *Ayre and Calder* navigation at Leeds is about 12½ miles, and 160 feet fall, by 18 locks: the whole lockage being 840½ feet by 91 locks, which are each 70 feet in length, and 15½ feet in width; the breadth of the canal at top is 42 feet, and it is 4½ feet deep in water. The boats are keel-bottomed, and carry 30 tons of goods, with which they can go down the *Ayre* and *Ouſe* as far as Selby; between Leeds and Wigan, 100 flatts of 42 tons burthen are employed in the coal and cannel trade, paſſage-boats alſo ply regularly on this part. At Leeds there is a fine baſon, and there are ſpacious warehouſes belonging to this company at the north-eaſt corner of Liverpool town, and it was intended in 1801, to conſtruct a new baſon from the North Graving-Dock on this canal, to the top of Plumbe ſtreet, for which

7000 cubic yards of earth were to be excavated, and the whole to be lined by 1200 cubic yards of ſtone maſonry. The coals are thrown out of the boats on a branch that proceeds near to the *Merſey*, and ſlide down a ſteep bank to a yard by the water ſide. At Foulridge there is a tunnel of 1030 yards in length, and 23 yards below the higheſt point of the hill; the ſoil of which proved ſo very looſe, that only 720 yards could be worked under-ground, the remainder was obliged to be opened from above, from 10 to 20 yards deep, and 20 to 30 yards wide at the top, although it was ſupported with immenſe labour and expence by timbers to prevent its falling, until the tunnel arch was formed, which is 18 feet high and 17 feet wide withinſide; it is arched with ſtone. At Furnloy near Burnley, there is another tunnel. At Cottingley below Bingley, and near Gargrave there are conſiderable aqueduct bridges over the Ayre river, and ſeveral leſſer ones in different places. Mr. *Longbottom* made a ſurvey for this canal in 1767, which was reviſed by Mr. *James Brindley* in 1768, under whom the canal was begun, after which Mr. *Robert Whitworth* and Mr. *Fletcher* were employed thereon. In 1770, the eaſtern end of the line was completed from Leeds to Holme-bridge, a diſtance of 33½ miles; about the end of 1794 this was extended to near Foulridge. May 1, 1796, the Foulridge tunnel was completed and the line opened to Burnley. In May 1801, the Furnloy tunnel was finiſhed, and the navigation extended to Enfield within 4½ miles of Blackburn; and in July 1801, the Altham branch was opened. The weſtern end of the line was begun as early as the other, and in 1770 the ſame was opened from Liverpool to the *Douglas* old navigation at Newborough, 28 miles; and on 19th October 1774, the preſent navigation was completed to Wigan. This company was authorized to raiſe 600,000l. the amount of ſhares 100l. The rates of tonnage are, on lime-ſtone and other ſtones ½d. per ton per mile, on coals and lime 1d. and on all other articles 1½d. per ton per mile. No wharfage to be taken unleſs goods remain 6 hours. In September 1805, the company propoſed lowering their rates of tonnage on the *Douglas* lower navigation. About the year 1794, a branch of the *Mancheſter Bolton and Bury* was propoſed to join this canal at Red-Moſs near Wigan. In September 1802, it was propoſed to make a branch from this canal near Wigan to *Bridgewater*'s canal at Pennington; alſo a branch or rail way from it to Low-hall collieries.

LEICESTER NAVIGATION. Acts 31, 34, (for *Aſhby* Canal) and 37 of Geo. III.—The general direction of the line of this navigation is about ſouth, following nearly the courſe of the Soar river, for 14 miles in the county of Leiceſter, its Charnwood Foreſt branch is conſiderably elevated. Its objects are the ſupply of Leiceſter with coals, deals, and general merchandize, the export of coals and limeſtone from the mines on its branches, and the farming products of the country. On the completion of the *Leiceſter Union* canal it will become a conſiderable thoroughfare. At Turn-water Meadow in Coſſington, it is joined by the *Leiceſter and Melton-Mowbray* navigation. Leiceſter is the 22d Britiſh town with a population of 16,953 perſons; Loughbourough and Mount-Sorrel are alſo conſiderable towns on the line. It commences in the baſon of the *Loughborough* navigation at that town, and terminates in the *Leiceſterſhire and Northamptonſhire Union* canal, at Leiceſter. From the baſon at Loughborough, a *rail-way* branch of 2½ miles, and a riſe of 185 feet, extends weſtward to a baſon at Foreſt-lane, at the eaſt end of the Charnwood Foreſt *water-level*, which level extends 8⅛ miles to near Barrow-hill, having a ſide cut of ¼ of a mile to Thringſton-bridge, and level. From the weſt end of the water-level a rail-way extends ⅞ of a mile further to Clouds-hill lime-works, and there connects or very nearly ſo with a branch of the *Aſhby-de-la-Zouch* canal; there is a ſhort rail-way branch of ſix chains to Barrow-hill lime-works; the Thringſtone-bridge branch is alſo continued by a rail-way to Coal-Orton in two branches of 1½ mile, and another of ¼ of a mile to Swannington-common coal-works. From *Loughborough* baſon to the junction of the *Leiceſter and Melton-Mowbray* navigation it is 3 miles, and level, and thence to the *Leiceſterſhire and Northamptonſhire Union* the diſtance is 11 miles, with a riſe of 45 feet. On Charnwood Foreſt there is a reſervoir for ſupplying the water-level, and a feeder of ¾ of a mile in length to convey the water to it. Near the weſt bridge in Leiceſter there is a baſon for the uſe of this navigation. Mr. *William Jeſſop* was the engineer; in December 1793 the part of the line between Loughborough and Sieby, near Mount Sorrel, was opened, and in February 1794 the remainder of the ſame to Leiceſter was opened. The company was authoriſed to raiſe 84,000 l. The rates of tonnage are various: ſee *Phillips's* 4to. *Hiſtory*, *Appendix*, p. 12. On the making of the *Aſhby* canal, with branches to the neighbourhood of the collieries connected with the Charnwood level, the company were allowed 2s. 6d. per ton on all coals dug in Swannington, Coal-Orton, or Thringſtone pariſhes, and carried through Blackfordby, on the *Aſhby* canal. The company are authoriſed to make rail-ways to any mines within 2000 yards of the water-level; and are to guarantee the *Loughborough* company a receipt of 2000 l. per annum, on condition of their taking 1 s. 6 d. or leſs per ton (but not leſs than 10 d.) for coals paſſing from Loughborough to the *Trent* river.

*Leiceſter and London Canal.* About the year 1792 printed propoſals and a plan were circulated, for a canal from the *Leiceſter* navigation at that town to the *Lea* river at Hertford, a diſtance of 77 miles; paſſing Market-Harborough, croſſing the *Nen* river near Wellingborough, and connecting with the *Ouſe* navigation at Bedford; its profeſſed object, as a rival to the *Grand Junction*, was the forming of the ſhorteſt communication between London, Liverpool, Hull, and Lynn, and the intermediate large trading towns, mines, &c.

LEICESTER AND MELTON-MOWBRAY NAVIGATION. Acts 31 and 40 Geo. III.—The general direction of this navigation is nearly E. following the courſes of the Wreak and Eye rivers, for about 12 miles, in the county of Leiceſter; it is not greatly elevated in any part, its objects are the ſupply of Melton-Mowbray with coals, deals, &c. and the export of the farming products of the country; it commences in the *Leiceſter* navigation at Turn-water Meadow in Coſſington, and terminates in the *Oakham* canal, at the town of Melton-Mowbray. The company were authoriſed to raiſe 40,000l. The original rates of tonnage may be ſeen in *Phillips's 4to. Hiſtory*, *Appendix*, p. 13, but theſe were altered and increaſed by the late act above, and ſeveral regulations made reſpecting tolls with the *Oakham* company. This navigation was completed in a few years after the paſſing of the firſt act.

LEICESTERSHIRE AND NORTHAMPTONSHIRE UNION CANAL. Acts 33 and 45 Geo. III.—The general direction of this canal is nearly S.E. by a crooked courſe of 43¾ miles in the counties of Leiceſter and Northampton; its middle part is conſiderably elevated, and ſkirts along the eaſtern ſide and near to the grand-ridge for ſeveral miles: its objects are the formation of a junction between London, Hull, and Lynn; the ſupply of the country through which it paſſes with coals, deals, &c. and the export of farming products; it is to connect at Northampton with a *rail-way* branch of the *Grand Junction*. Leiceſter is the 22d Britiſh town, with a population of 16,953 perſons, and Northampton is the 85th, with 7,020 perſons, Market-Harborough is alſo a conſiderable place near the line. This canal commences in the *Leiceſter* navigation in the town of Leiceſter, and terminates in the *Nen* river at the town of Northampton; there is a cut of $3\frac{3}{4}$ miles in length to Market-Harborough. From the *Leiceſter* navigation to Fleckney near the Saddington tunnel is $12\frac{3}{4}$ miles, with 160 feet riſe; thence to near Great Oxenden $13\frac{1}{2}$ miles are level; thence in $\frac{1}{8}$ of a mile is 50 feet riſe; thence the ſummit-pound extends through Oxenden and Kelmarſh tunnels to near Maidwell, $4\frac{7}{8}$ miles and level; thence to the junction of the North river near Northampton are $11\frac{3}{4}$ miles, with a fall of $197\frac{1}{2}$ feet, and thence to the head of the *Nen* navigation is $\frac{3}{4}$ of a mile and level. The Market-Harborough cut is level. At Gumley there are a baſon and warehouſes. There are four tunnels on this line, viz. at Foxton, of 1056 yards in length; at Kelmarſh, of 990 yards in length; at Saddington, of 880 yards in length, and at Oxenden, of 286 yards in length. On Oxenden and Kelmarſh brooks are the aqueducts for the ſupply over the ſummit-level, but flood-waters alone are to be taken. There are a great number of ſmall aqueducts over the ſtreams which it paſſes. Mr. *John Varley*, ſen. and Mr. *C. Staveley*, jun. are the engineers. In March 1800, the tunnel at Saddington was finiſhed, and the line opened from Leiceſter to Gumley, a diſtance of 17 miles; but ſmall progreſs appears to have been ſince made with the other three tunnels, and the remainder of the line, intended to form the union. The rates of tonnage on coals and coak are $2\frac{1}{2}$d. per ton, per mile, but not to exceed 5s. for any diſtance; for lime, lime-ſtone, dung, and manure $1\frac{1}{4}$d. per ton, per mile, but not exceeding 2s. 6d. per ton, on any diſtance; for live cattle, ſtones, bricks, tiles, ſlates, ſand, iron-ſtone, pig-iron, and pig-lead, 2d. per ton, per mile, and for other goods 3d. per ton, per mile; troops and government ſtores are exempted. Road-materials, and manures (except lime) for the uſe of the proprietors of lands on the pounds, may alſo paſs the locks when the water runs waſte thereat. The towing path may be uſed as a bridle and drift-way by the owners of adjoining lands. By the firſt act the company were authorized to raiſe 300,000l. ſhares 100l. each; the laſt act was for varying ſome parts of the line and amending the former one. About the year 1793, the *Uppingham* canal was in contemplation, and its junction with this canal is provided for in the firſt act above. In 1803 it was propoſed to alter and ſhorten the branch to Market-Harborough, and to make a feeder from Wiſtow brook; and in the ſame year Mr. *Thomas Telford* ſurveyed the line of country between Gumley baſon and Buckby wharf on the *Grand Junction* canal, propoſed as a ſubſtitute for the ſouthern part of the line to Northampton.

Leominster Canal. Acts 31 and 36 Geo. III.—The general direction of this canal is nearly W. by a crooked courſe of $45\frac{3}{4}$ miles, in the counties of Worceſter, Salop, and Hereford; its weſtern end is very conſiderably elevated; its objects are the ſupply of Leominſter and the country with coals from the Pinſax mines near its eaſtern end, and the export of iron, lime, and agricultural products: Kington, Preſteign, Leominſter, Ludlow, Tenbury, Cleobury-Mortimer, and Bewdley are conſiderable towns on or near to the line of this canal: it commences in the *Severn* river at Areley near Stour-port, and terminates at the town of Kington: it has two ſhort cuts to mills near Tenbury. From the *Severn* river to the eaſt end of the Pinſax tunnel it is 3 miles, with a riſe of 207 feet; thence through that tunnel, and the Souſnant tunnel to its weſtern end, it is 9 miles and level; thence to the river Rea aqueduct is 1 mile, with a fall of 30 feet; thence to Letwich brook, 7 miles, it is level; thence to Wiſton, $4\frac{1}{2}$ miles, is a riſe of 36 feet; thence to near Luſton, $5\frac{1}{4}$ miles, is level; thence to Leominſter, $1\frac{1}{2}$ mile, is a fall of 18 feet; thence to near Kingſland are $4\frac{1}{2}$ miles, with 64 feet riſe; thence to Milton are $3\frac{1}{2}$ miles, with 37 feet riſe; thence to Stanton-park are $2\frac{1}{2}$ miles, with a riſe of 152 feet, and thence to Kington are 4 miles, and level. At Pinſax is a tunnel of 3850 yards, and the other at Souſnant is 1250 yards in length. There are conſiderable aqueduct-bridges over the Rea river at Knighton, over the Teme at Woferton, and over the Lugg at Kingſland: a power is provided in the act for inclined-planes inſtead of locks, if the ſame ſhould be found moſt eligible; ſprings of water within 2000 yards of the line may be taken. Mr. *Thomas Dadford*, jun. is the engineer. In July 1796 the difficult tunnel at Putnal-field in Souſnant was finiſhed, and in November 1796, near 20 miles of canal, from Mamble coal-works to the town of Leominſter were opened, and coals, which before ſold there at 1s. 6d. per cwt. were at once reduced to 9d. per cwt.! On the 1ſt of June 1797, the entrance of the canal from the *Severn* was opened: ſince which conſiderable progreſs has been made in the works: in May laſt (1805,) the Pinſax mining company was propoſed, for opening new coal and iron mines near that place, on the line of the canal, which was expected to facilitate its completion. The *Leominſter* company have been authoriſed to raiſe 370,000l. The tonnage rates are too long for our room, they will be found in *Phillips's* 4to. *Hiſtory*, *Appendix*, p. 5 and 6. About the year 1794, the *Welſhpool and Leominſter* canal was propoſed to join this at Woferton.

Liffey River, (*Ireland*). The direction of this river is nearly weſt, in Dublin county, from the bay of Dublin to the entrance baſon of the *Grand Canal* in Dublin city, where alſo are a Harbour and Docks that have been improved, under Mr. *William Jeſſop;* the ſpring tides riſe only 13 feet at theſe dock-gates. In the year 1800 it was propoſed to avoid the bar at the mouth of the *Liffey*, by cutting a new channel or canal for ſhips from Dunleary to Kingſtead dock; it was alſo propoſed to make Dalkey ſound a ſafe harbour, and to make a cut from thence to the *Grand Canal* baſon; the bill for this purpoſe was paſſed by the commons, but was rejected by the houſe of lords. Ormond bridge, on this river, was carried away by a flood, and in September laſt (1805,) the corporation of Dublin harbour offered premiums for the beſt plans for a new bridge at this place.

Limehouse Canal. The direction of this canal is about N.E. for $1\frac{1}{2}$ mile, in the county of Middleſex; it is but little elevated above the level of the ſea; its object is to ſhorten the navigation between the *Lea* river and the port of London, by avoiding the circuit round the Iſle of Dogs; it commences in the river *Thames* near Limehouſe church, and terminates in the *Lea* river at Bromley near Bow, having a riſe of $17\frac{1}{2}$ feet. This canal was cut at the expence of the *city of London*, in an early part of the preſent reign, and its locks, which are of wood, and its other works, form a great contraſt to the improved locks and appendages of modern canals. In 1773 a cut from the intended *London and Waltham-Abbey* canal was intended to join this near Limehouſe church.

Limerick Canal, (*Ireland*). This canal was cut near 40 years ago from the town of Leitrim to a moraſs within a ſhort diſtance, for the purpoſe of bringing turfs, to ſupply the town of Limerick with fuel, and which by their cheapneſs ſuperſeded in a great meaſure the uſe of coals, which coming by a long coaſt-ways navigation were very dear.

*Liſkeard Canal.* In 1777, Mr. *Edmund Leach* propoſed a canal, or rather a ſyſtem of water-levels and inclined-planes, from the tide-way in the *Looe* river, at Sand-place in Morval to Bark-mill-bridge, in St. Clear; this was propoſed to be accompliſhed by two levels of 9 and 6 miles in length, (one of which, in its ſerpentine courſe, went within ¼ a mile of Liſkeard town,) connected with each other and the river below by two inclined planes for boats, the principles of which have been already explained; the eſtimate was 17,500l. The objects of this navigation were the carrying up of lime and ſea-ſand for manure, and exporting corn, &c.

*Liverpool and Runcorn.* About the year 1771, a ſurvey was made by Mr. *James Brindley*, for a canal from the town of Liverpool upon one level, to croſs the *Merſey* at Runcorn-gap, by an aqueduct bridge, and join the duke of *Bridgewater*'s canal; beſides the great width of the Merſey at this place, a tide, which riſes 14 feet, was alſo to be encountered.

*Llandovery and Llanelly.* In September 1801, notices were given for an intended canal from Spitty in the pariſh of Llanelly, on the *Burry* river, through Llangennech, Llanedy, Laudebye, Llandingar, &c. to Llandovery or Llanyneddyvi, in the county of Caermarthen in South Wales. The objects of this canal were ſince accompliſhed by the *Caermarthenſhire* rail-way, over nearly the ſame tract of country.

*London Canal.* In July 1802, a ſurvey was made for a canal, about in a weſt direction, for near 7 miles, in the county of Middleſex: commencing in the *London Docks*, (and thereby communicating with the *Thames* river,) to paſs Weſt's-gardens, the mount in White-chapel road, and Bethnal-green New road, acroſs Hackney road, through Middleſex-place acroſs Kingſland road, near Iron-monger's alms-houſes, to paſs north of Lady Lumley's alms-houſes at Hoxton, acroſs the city road below the turnpike-gate, acroſs Goſwell-ſtreet, ſouth of Goſwell-place, acroſs St. John's-ſtreet, north of Taylor's brewhouſe, under the field ſouth of the New-river head, over the valley at Bagnige-wells, acroſs Gray's Inn-lane at the weſt corner of the Welſh Charity-ſchool, acroſs the New road to the eaſt corner of Bedford nurſery, acroſs Tottenham court road between St. James's burying-ground and the New-river reſervoir, paſt the fronts of the Artichoke and Queen's-head public houſes, and acroſs the Edgeware road to the baſon of the *Grand Junction* canal at Paddington, the riſe in this diſtance being about 90 feet. The great number of bridges required, the paſſing of the field near Iſlington full of water-pipes in all directions, belonging to the New-river company, by an arch under the ſame, and a large embankment or aqueduct bridge near Bagnige-wells, were difficulties in the way of this project, but to which the ſubſcription for ſhares (which almoſt immediately filled to the amount of 400,000l.) would have been equal; had not the inability of the *Grand Junction* company to furniſh the water neceſſary for the lockage, and the oppoſition of ſeveral powerful land owners, on account of its making ſome alterations neceſſary in their building projects, fruſtrated the ſcheme altogether for the preſent. The weſtern branch of the *Grand Junction*, of which we have before ſpoken, was in contemplation at the time this canal was intended, and water was propoſed to be obtained thereby from the *Thames* for this canal, the Colne millers having it unfortunately in their power, to prevent any being obtained from that river; Mr. *John Rennie*, who gauged the ſtream of the *Thames*, in the dry ſummer of 1794, at Laleham (which is after it has received the main ſtreams of the Colne), found 1155 cubic feet of water to paſs in one ſecond of time, which is 184 times what would be required to be taken from this river higher up near Great Marlow, and brought by the *Grand Junction* level branches, for ſupplying the lockage of this canal, ſuppoſing 60 locks containing 1055 cubic feet each, to be uſed daily. After the oppoſing intereſts were found too ſtrong to leave any proſpects of carrying this canal, a faint effort was made to accompliſh a *rail-way*, through nearly the ſame line, but with no better ſucceſs. In 1773, Mr. *Robert Whitworth* made a ſurvey for the city of London, and recommended a line of canal from the *Lea* river at Lee-bridge, to near the ſame ſpot which the *Grand Junction* baſon now occupies at Paddington: it was intended as branches eaſt and weſt of the *London and Waltham-Abbey* canal.

*London Lynn and Norwich.* In the year 1785, Mr. *John Philips* publiſhed a thin 4to. treatiſe, to endeavour to call the public attention to a canal between the *Ouſe* river at the port of Lynn, and the *Thames* river at Limehouſe in London, with a branch to the *Yare* river at Norwich. It appears that Mr. *P.* travelled through the propoſed tract of country in 1779 and 1780, but took no levels or other neceſſary particulars, yet ventures to ſtate, that he could execute this canal, 36 feet wide, and 4½ feet deep, for 200,000l. And it is held out, that 28,000 oak Trees, to be planted on the banks of this canal, will, in 50 years, repay all its expences within 60,000l. In 1802 we are told that Mr. *Ralph Dodd* made an effort to revive this or a ſimilar ſcheme, and wiſhed to denominate it the North London Canal.

*London and Waltham-Abbey.* In the year 1773, at the inſtance of Mr. *James Sharp*, Mr. *Robert Whitworth* was employed by the city of London to ſurvey the line for a canal between the centre of the quarters in Moorfields, London, to the river *Lea* at Waltham-Abbey; a diſtance of 14 miles, almoſt in a north direction in the counties of Middleſex and Hertford; this line was to be level (and about 30 feet above ſpring-tides in the *Thames*,) there was a cut of ⅜ of a mile, and 33 feet fall propoſed to the *Lea* river at Lee bridge, and another of 4⅝ miles to Wellin's Farm near Paddington, with 49¾ feet riſe; nearly to the ſame level as the *Grand Junction* baſon now has; alſo another cut of near 2 miles to the *Limehouſe* canal near the church, with a fall of 42 feet (to the common neap tides in the *Thames*). The width was to be 60 feet, and depth 4½ feet; in Moorfields and near Holywell Mount, large baſons were intended; between Stamford-hill and High-croſs a very large embankment was neceſſary, another at Hackney brook, and another at St. Pancras brook; at Ponder's end was to be a deep-cutting to avoid the houſes; 15 turnpike road-bridges, and 22 road-bridges of leſſer ſize were neceſſary, the whole expence Mr. *Whitworth* eſtimated to be 98,229l. In 1802, this or a ſimilar ſcheme ſeems to have been in contemplation, but to join the *Thames* near Bell-wharf in Shadwell inſtead of the *Limehouſe* cut.

LOOE RIVER. The general direction of this navigation is nearly N. for about 3¼ miles, on the ſouth coaſt of Cornwall, it commences at the ſea near Eaſt Looe, (which is a conſiderable town,) and terminates at Morval bridge, near which, at Sand-place, it was, in 1777, propoſed to be joined by the *Liſkeard* canal; its objects are the carrying up of coals, and ſea-ſand as manure, and the export of agricultural products.

LOUGHBOROUGH NAVIGATION. Act 16 Geo. III.—The general direction of this navigation is nearly S. for about 9 miles, following the courſe of the Soar river, except in the laſt mile, which is a new cut; it is but little elevated; at the baſon, 300 yards from its ſouth end, it is joined by the line of the *Leiceſter* navigation and by the Charnwood-Foreſt rail-way branch belonging thereto. It commences in the *Trent* river (nearly oppoſite to the *Erewaſh* canal, and near to the *Trent* canal) near Sawley, and terminates at the Ruſhes near the town of Loughborough, which is a conſiderable place; its objects are as various as the trade of the *Trent*, and the wants of Leiceſter and other great towns; it forms alſo part of the line of communication which the *Leiceſterſhire and Northamptonſhire Union* canal is to open. On the making of the *Leiceſter* navigation, that company guaranteed the amount of the tolls on this, to amount to 3000l. annually, on condition of no more than 1s. 6d. per ton on coals or leſs than 10d. being taken by this company.

LOUTH NAVIGATION. The general direction of this navigation is nearly S.W. for 14 miles in the county of Lincoln, it is but little elevated above the ſea; its objects are the ſupply of Louth, and the adjacent country with coals, deals, &c. and the export of farming produce; it commences at the ſea-lock and ebb-gates in Titney Haven (at the mouth of the *Humber* river), and terminates at the town of Louth. From Titney Haven to the Louth river near North Cockerington $9\frac{3}{4}$ miles is level, and but little higher than low-water mark, being a new cut through a low fenny country; thence to Kiddington old mill, $2\frac{3}{4}$ miles, is 24 feet riſe; thence to the Leather-mill meadow, $\frac{3}{4}$ of a mile, is $11\frac{1}{2}$ feet riſe; thence to Louth is $\frac{3}{4}$ of a mile with 21 feet riſe. Mr. *John Grundy* made a ſurvey of this line, which was reviſed by Mr. *John Smeaton*, in 1760, the eſtimate of expence being near 15,600l. See *Smeaton*'s *Reports*, vol. i. p. 23.

LOYNE RIVER. The general direction of this river (ſometimes called the Lune) is nearly N.E. for about 7 miles in the county of Lancaſter; the tide flows through its whole length; its object is the foreign trade of Lancaſter, particularly in cabinet-maker's wares, a branch of the *Lancaſter* canal is to connect with it at Glaſſon, where a ſpacious wet-dock is intended. Lancaſter is the 56th Britiſh town with 9,030 inhabitants; this river commences in the Iriſh ſea at Sunderland point, and terminates at Lancaſter old bridge, ſome diſtance below Mr. *Rennie*'s famous aqueduct bridge over this river. It appears, that in the year 1799, 52 veſſels cleared out of this river for the Weſt Indies with 11,669 tons of goods in more than 90,000 packages, worth $2\frac{1}{2}$ millions ſterling. In October 1799, it was in contemplation, to conſtruct a ſpacious dock at Thornbuſh for large ſhips, with a canal from thence of 6 miles in length through Glaſſon-dock, and nearly up to the town of Lancaſter, to be wide and deep enough for the largeſt veſſels that trade to that place.

LYNN RIVER. The general direction of this river (ſometimes called the Lenne, the Nar, or the Setchy) is nearly S.E. by a crooked courſe of about 15 miles in the county of Norfolk; it is not greatly elevated in any part; its objects are the import of coals, deals, &c. and the export of farming produce; Lynn is the 50th Britiſh town with a population of 10,096 perſons, Narford is alſo a conſiderable town; it commences in the Great *Ouſe* river near the harbour of Lynn, and terminates at the town of Narford.

*Macclesfield and Leek.* In 1796, it was ſaid, that a canal between theſe places was in contemplation, with extenſions thereof to the Staffordſhire potteries, in all 29 miles, on which no locks were to be uſed. Macclesfield is the 61ſt Britiſh town with 8,743 inhabitants.

*Maidenhead and Iſleworth.* In the year 1770, Meſſrs. *James Brindley* and *Robert Whitworth*, were employed by the city of London, to ſurvey the line of a canal from the *Thames* river at Iſleworth, to the ſame river again below Bolter's-lock near Taplow-mill, about 1 mile above Maidenhead-bridge, and at the lower end or termination of the 3d diſtrict of the *Thames and Iſis* navigation; the length of this line is $19\frac{3}{8}$ miles with a riſe of $71\frac{1}{3}$ feet. The canal was propoſed to be 50 feet wide and 4 deep, with cuts to the *Thames* at Windſor, and near Laleham; in the firſt 5 miles 7 locks were to be built, and one in the remaining diſtance; the eſtimate of expence was 47,885l. A bill for this was brought into parliament, but the oppoſition of the landowners proved fatal to it; although, as appears, by an accurate meaſurement and ſection of the river between theſe two points made by the above engineers (ſee *Gentleman's Magazine for March* 1771), that the length of the river-navigation is $37\frac{3}{8}$ miles in this diſtance, and greatly obſtructed by ſhallows, ſome only $2\frac{1}{2}$ feet deep in dry ſeaſons. In the year 1791, this ſcheme was revived, and in 1794, Meſſrs. *Robert Whitworth* and *Robert Mylne* were employed to reviſe this line; their deſign has 12 miles of level at the upper end, and 10 of them ſtraight; the canal to be 5 feet deep. The tolls at firſt propoſed were $\frac{1}{2}$d. per ton per mile on all articles; out of this revenue, it was propoſed to improve the river navigation between Mortlake and Bolter's-lock: and to raiſe the neceſſary ſums on life annuities, ſo that after a fund was eſtabliſhed for repairs and management, the canal might at length become free for the public uſe. At Bolter's lock the *Reading and Maidenhead* canal was propoſed to join this canal, by which the navigation from London weſtward would have been amazingly ſhortened and improved.

MANCHESTER ASHTON AND OLDHAM CANAL. Acts 32, 33, 38, 40, and 45 of Geo. III.—The general direction of this canal is nearly E. for about 7 miles in the counties of Lancaſter and Cheſhire; its eaſtern end is conſiderably elevated; its objects are the ſupply of Mancheſter and Stockport with coals, cannel, ſtone, lime, &c. and forming part of the intended direct communication between Liverpool, Mancheſter, and Hull, by means of the *Huddersfield* and other canals; by means of its Duckenſield branch it communicates with the *Peak-Foreſt* canal. Mancheſter is the 2d Britiſh town with 84,020 inhabitants, Stockport is the 29th with 14,830 perſons, and Oldham the 35th with 12,024 perſons, Aſhton is alſo a conſiderable town, and the country round about is full of inhabitants. This canal begins in the *Rochdale* canal near Piccadilly ſtreet in Mancheſter, and terminates in the *Huddersfield* canal at Duckenfield bridge, in the pariſh of Aſhton underline; from Duckenfield bridge is a branch of $\frac{1}{4}$ mile in length, over an aqueduct bridge on the Tame river at Walk-mill, into Duckenfield, there to join the *Peak-Foreſt* canal. There is a branch of 1 mile to Aſhton town, another of $3\frac{3}{4}$ miles to New Mill in the pariſh of Oldham (but $2\frac{1}{2}$ miles diſtant from the town), from which laſt at Boodle-wood a branch proceeds over Water-Houſes aqueduct on the Medlock brook, to Park collieries at Stake-Leach near Hollingwood, alſo in the pariſh of Oldham; from Droylſden, a branch of 6 miles proceeds to the end of the town of Stockport in Heaton-Norris pariſh, and from this laſt, a branch of 3 miles proceeds in a N.E. direction to Beat-Bank in Denton. The line has a riſe of 152 feet between the *Rochdale* and *Huddersfield* canals. This canal is 33 feet wide at top, 15 feet at bottom, and 5 feet deep in water, except the ſummit pound which is made 6 feet deep to act as a reſervoir; the locks are 80 feet long, and the boats carry 25 tons; there are three conſiderable aqueducts at Duckenfield, Ancoats, and at Water-Houſes. This company were authoriſed by their firſt 4 acts to raiſe 170,000l., and a further ſum by the late act; amount of ſhares 100l. The line of this canal was completed between Mancheſter and Aſhton about the end of the year 1796, and in January 1797, the Stockport branch was opened; ſome of the works on this canal ſuffered by a flood in Auguſt 1799. The rates of tonnage are given in *Phillips*'s 4to. *Hiſtory*, *Appendix*, p. 21. In 1802, we were told, that the ſhares in this concern were 20l. below par.

MANCHESTER BOLTON AND BURY CANAL. Acts 31, and 41 of Geo. III.—The general direction of this canal is N.W. for about 11 miles in the county of Lancaſter; its northern end is conſiderably elevated; its objects are a communication between the great manufacturing towns of Mancheſter, Bolton, and Bury, and the carriage of coals and other articles for their ſupply, and forming part of the line of communication between Mancheſter and the *Leeds and Liverpool* canal. Mancheſter is the 2d Britiſh town with 84,020 inhabitants, Bolton is the 32d with 12,592 perſons, and Bury the 84th with 7,072 perſons. This canal commences in the *Merſey and Irwell* navigation near the junction of Medlock brook (by which it communicates with *Bridgewater*'s canal near the beginning of the *Rochdale*) at Mancheſter, and terminates at the town of Bolton, it has a branch of 4 miles in length to the *Haſlingden* canal at the town of Bury. From the *Merſey and Irwell* navigation, is a riſe of ſeveral locks to the baſon in Salford pariſh; thence for about 4 miles is level; in the next 3 miles are 12 locks, the remainder of the line is level, including the branch to Bury; the whole riſe is 187 feet. Previous to 1794, this canal was begun, and ſeveral locks were built for narrow boats, but on account of the branches connecting with wide canals which were propoſed about that time, theſe were pulled up and rebuilt, and the canal widened, including ſome expenſive deep-cutting and embanking; a want of ſkill or care appeared alſo, we are told, in the ſetting out of this canal by cutting deep through rocky ground which might have been avoided. There are two aqueduct bridges over the Irwell at Clifton-Hall and near Stocks, and one over the Leven at Long-fold, theſe are ſaid to be 20, 16, and 10 yards high; the canal was, in 1799, ſupplied by a feeder from the Irwell at Bury, but in 1802, a reſervoir and feeder alſo was found neceſſary in Radcliffe pariſh. In 1797, this canal was completed to Bolton, except the locks to connect with the *Merſey and Irwell* navigation; on the 17th of Auguſt, 1799, a great flood happened, which carried away the lower bank of this canal for 100 yards together on the ſummit-level, and another breach therein alſo happened, by which the navigation to Bolton, &c. was ſome time interrupted. This company were authoriſed by their firſt act to raiſe 97,000l., and a further ſum by the late act. The rates of tonnage are for coals, lime-ſtone, ſtone, bricks, clay, &c. 2d. per ton per mile, if they paſs a lock; but all theſe, except lime-ſtone, are to paſs on the levels for ½d. per ton per mile; and when the water runs waſte at the locks, lime-ſtone is alſo to pay only ½d. on any part; the tonnage at the entrance of the *Merſey and Irwell* navigation is alſo regulated by the firſt act. Paſſage-boats from Bolton to near Mancheſter are eſtabliſhed; but when water has been ſcarce, the paſſengers have been required to walk paſt the locks to another boat on the lower pound to avoid the waſte of lockage-water. About the year 1794, it was in contemplation to make a branch weſtward from Bolton, to connect with the *Leeds and Liverpool* canal at Red Moſs near to Wigan, and to make a grand extenſion of the Bury branch eaſtward to the *Calder and Hebble* navigation at Sowerby-bridge, paſſing the grand-ridge between Littleborough and Rippondale by a tunnel of 5 miles in length! after paſſing a ſhorter tunnel of ½ a mile at lower Lomax near Heyford. In 1796, it was propoſed to extend a branch from the baſon in Salford pariſh to Oldfield-Lane in that town; and, in 1799, it was in contemplation to build an aqueduct bridge over the Irwell, and connect this canal with *Bridgewater*'s canal, inſtead of locking down into the *Merſey and Irwell* navigation.

MARKET-WEIGHTON CANAL. Act 12 Geo. III.—The general direction of this canal is nearly N. for about 11 miles in the Eaſt Riding of Yorkſhire; it has but little elevation above the ſea; its objects are the conveyance of coals, deals, &c. to Market-Weighton and the ſurrounding country, the export of farming products, and the better drainage of the fen lands through which it paſſes; it commences in the tide-way in the *Humber* river (oppoſite to the *Trent* river) at Foſdyke-Clough, and terminates near Market-Weighton. It has a ſea-lock next the *Humber*, from whence it is level to within a ſhort diſtance of its northern end, where is a riſe of 4 or 5 locks. Mr. *John Smeaton* was conſulted on this line of canal and drainage, in 1765, at which time a branch of this canal to Pocklington was in contemplation; for the rates of tonnage, ſee *Phillips*'s 4to. *Hiſtory*, p. 270. This navigation was completed ſoon after the paſſing of the act.

*Mawgan Canal.* About the year 1775, a narrow canal was cut of 6 or 7 miles in length; from Port Mawgan near Trenance on the N.W. coaſt of Cornwall, to within 3 miles of St. Columb Major, it was intended for bringing up coals and ſea-ſand for manure, and for carrying down china-ſtone and clay, ſubſtances found in St. Dennis and St. Stephens, and uſed in the Staffordſhire potteries; but after ſeveral of the adventurers were ruined, the ſcheme was totally abandoned.

MEDINA RIVER. The direction of this navigation is ſouth, and nearly ſtraight for 4½ miles, in the Iſle of Wight in Hampſhire; the tide flows through its whole length; its object is the ſupply of Newport and the central parts of the iſland with coals and other articles; it commences at Cowes harbour (oppoſite *Southampton Water*), and terminates at Newport bridge.

MEDWAY RIVER (*lower diſtrict.*) Acts 32 and 42 of Geo. III.—The general direction of this navigation is nearly S.W. for about 27 miles by a bending courſe in the county of Kent; it is but little elevated in any part; its objects are the import of coals, deals, and other articles, and the export of Kentiſh-Rag lime-ſtone, fullers-earth, farming-produce, &c. near its northern termination, it connects with the eaſt Swale or tide-way paſſage, of about 15 miles in length ſouth of Sheppy iſland, connecting with the *Thames* near Whitſtable; and, at Nicholſon's ſhip-yard in Strood it is joined by the *Thames and Medway* canal. Chatham is the 46th Britiſh town with a population of 10,505 perſons, Maidſtone is the 66th with 8,027 perſons, and Rocheſter is the 90th with 6,817 perſons, Sheerneſs, Queenborough, and Milton, are conſiderable towns on or near this navigation, which commences in the river *Thames* at the Nore, and terminates in the upper *Medway* navigation at Maidſtone bridge. Over this river at Rocheſter, there is a ſtone bridge of 11 arches and 550 feet long. At Chatham is a very conſiderable naval arſenal. The powers of the above acts for repairing and levying of tolls, extend no further down this river than from Maidſtone to the tide-way at Aylreſford bridge.

MEDWAY RIVER (*upper diſtrict.*) The general direction of this part of the river is S.W. for about 12 miles in the county of Kent; it is not much elevated in any part; its objects are the import of coals, deals, &c. and export of lime-ſtone, fullers-earth, farming-produce, &c. beſides Maidſtone, mentioned above, Tunbridge is the only conſiderable town on this line; it commences in the lower *Medway* navigation and terminates at the town of Tunbridge. In 1802, the *Medway and Rother* canal was propoſed to connect with this river at Yalden-lees.

*Medway and Rother.* In the year 1801, a ſurvey and eſtimate was made by Mr. *Sutherland*, for a canal from the *Rother* river intended navigable branch at Small-Hithe, to the *Stour* river at Canterbury (at the S. end of the propoſed *Canterbury and Nicholas-bay* canal), with a branch thereof to the *Medway* river at Yalden-lees, through the counties of Suſſex and Kent; its objects were the ſupply of the interior country with coals and other articles, the export of timber and farming products, and forming a communication between the ſouth coaſt at *Rye-harbour* and the *Thames* river, &c. Forty-ton boats were intended to be uſed, and the canal to be 4 feet deep. The ſummit was found to be about 100 feet above the ſea, and nearly 50 miles of the line was to be upon one level.

MENAI STREIGHT. This ſtreight ſeparates Angleſea iſle from North Wales, and has nearly a N.E. direction for about 16 miles, through which the tide flows; it extends from Caernarvon bay at Abermenai Ferry to Lavan Sands; Caernarvon and Bangor are conſiderable towns on this line. In 1801, and 1802, it was in contemplation to build a caſt-iron bridge over this ſtreight at Swelly rocks near Porthacthavy Ferry not far from Bangor.

MERSEY AND IRWELL NAVIGATION. Acts 7 Geo. I. and 34 Geo. III.—The general direction of this navigation is nearly eaſt, by a crooked courſe of 50 miles in the county of Lancaſter, and ſkirting the county of Cheſter; the firſt 20 miles being by a moſt ſpacious eſtuary of the *Merſey* river; it is not greatly elevated in any part; its objects are moſt important, particularly in the immenſe trade between Liverpool and Mancheſter, and Hull, alſo by four different routes acroſs the grand-ridge; the navigations immediately connecting therewith are, at Elleſmere-port in Netherpool, where it is joined by the *Elleſmere* canal; at Weſton by the *Weaver* river; at Runcorn-Gap, and again at Mancheſter (by the Medlock Brook), by *Bridgewater*'s canal, beſides being croſſed thereby on Barton aqueduct; at Fidlers-ferry, and alſo at Sankey Brook, by the *Sankey* canal; and at Mancheſter, near the junction of Medlock Brook, by the *Mancheſter Bolton and Bury* canal: beſides which, the following commence very near to this navigation, although they do not actually lock down into it: viz. the *Leeds and Liverpool*, at the baſon in Liverpool, the *Trent and Merſey*, at Preſton Brook, and the *Rochdale*, at Mancheſter; to which alſo the *Mancheſter Aſhton and Oldham* ought to be added, although a very ſhort ſpace of two other navigations muſt be paſſed through before you can reach the Irwell therefrom. Mancheſter is the 2d Britiſh town, with a population of 84,020 perſons; Liverpool is the 4th, with 77,653 perſons; and Warrington is the 45th, with 10,567 perſons. This navigation commences in the Iriſh Sea, at Wallazy, about 3 miles below Liverpool, and terminates at the bridge between Mancheſter and Salford: but the powers of the act, as to improving the river and collecting the tolls, at firſt extended no lower than Bank-key, near Warrington, and ſince to Runcorn Gap. The winding courſe of the river has been ſhortened in ſeveral places by ſide-cuts acroſs the loops, and locks and wears have been erected in ſeveral places, the riſe in the whole length being about 70 feet; theſe rivers are ſubject to ſudden and violent floods, which have at times deſtroyed ſeveral of the navigation works; in Auguſt 1804 a new ſide-cut was completed, for ſhortening the courſe of the navigation, and avoiding the ſhallows in the river; between Warrington and Runcorn Gap it croſſes the *Sankey* canal. The famous wet-docks at Liverpool are an appendage to the *Merſey* navigation, and are indeed a part of that river, from not being excavated in ſolid ground, where houſes formerly ſtood, as they did on the ſite of the *London Docks*; but all of them, except the old Dock, which was a natural creek or pool, have been formed in the front of the town, by embankments in the river, which is here ¾ of a mile wide. At the lower or northern end of theſe docks, as we viewed them in 1797, is a large inlet or walled tide-baſon, which connects with the river, and is dry at low water, from the S.E. corner of this is the entrance of *St. George's Dock*, which was the third large dock that was made, and is nearly a parallelogram, of 250 yards long and 100 wide, its quay being 670 yards long, its gates are 25 feet high and 38 feet wide, and it coſt about 21,000 l. Paſſing ſoutherly, we next arrive at a dry baſon and wharf, called the old quay, for the flatts or veſſels belonging to the *Merſey and Irwell* company, which are about 32 in number; and ſome diſtance ſouth of this is another large inlet to a ſpacious dry baſon for ſhips: from the north end of this baſon are other gates into *St. George's Dock*, above mentioned, and ſtraight forwards is the entrance to the *Old Dock*, or the firſt that was built, and is wholly within the town; this dock forms an irregular parallelogram, of 200 yards long and about 80 yards wide, its gates being 23 feet high and 34 feet wide; it is lined with bricks, but all the other dock, baſon, and pier walls are of beautiful hewn ſtone. From the ſouth-eaſt corner of the laſt deſcribed dry-baſon is the entrance to *Salt-Houſe Dock*, which was the ſecond made, is an irregular trapezium, of 21,928 yards in area, and has 640 yards in length of quay, its gates being 23 feet high and 34 feet wide. A conſiderable diſtance ſouth of the laſt dry-baſon is an inlet to a ſmall wet-dock, which belonged to the late *duke of Bridgewater*, and is uſed by the flatts which trade between Mancheſter and Liverpool, by *Bridgewater*'s canal, theſe carry 50 tons, and 42 of them belonged to his grace. Proceeding further along the ſhore ſouthward, we arrive at another inlet and dry-baſon, from the north ſide of which is the entrance to the *King's Dock*, the fourth which was made (being finiſhed in 1788), and is a regular parallelogram, of 290 yards long and 90 wide, the gates thereof being 25 feet high and 42 feet wide. From the head, or eaſt end of the laſt dry-baſon is the entrance to the *Queen's Dock*, which was the fifth and laſt that was made, being alſo the largeſt and moſt complete of the whole, its length is 270 yards, breadth 130, its gates 25 feet high and 42 feet wide, and it coſt about 25,000 l. An attempt was made to form a dock in the ſite of the *old Dock*, as long ago as 1561, but it was not until the year 1710 that the firſt act was obtained, of which there are ſeveral, for building and regulating the preſent docks. In 1799 application was made again to parliament for powers to build two more large docks, one of them more northerly than any of thoſe we have deſcribed, and the other in front of *Salt Houſe* dock. The whole extent of theſe docks and quays will then be nearly 2 miles by the ſide of the *Merſey*! With the two dry baſons laſt deſcribed, ſeveral convenient graving-docks connect, for the building or repair of ſhips, ſome of the latter are long enough to hold three ſhips in length. The ſpace between theſe graving-docks and in front of the docks, is principally occupied by timber-yards. The draw-bridges over the entrances to ſome of theſe docks are among the largeſt and moſt complete in England: Mr. *Morris* erected and has the care of them and the docks. On the ſouth ſide of the *King's Dock* is a ſpacious warehouſe 210 feet long and 180 wide, for tobacco, of which it will contain 7000 hogſheads. The ſpring-tides here riſe 21 feet, but the neap-tides only 12 feet, on which account large ſhips cannot enter or leave theſe docks for ſome days during the loweſt tides. Fires and ſmoking of tobacco are on no account allowed on board of ſhips in theſe docks, nor lighted candles, except in proper lanthorns, and no gunpowder is allowed on board; by a ſtrict attention to which rules, no fire has ever happened in theſe docks. In the year 1797 the tolls in theſe docks amounted to upwards of 13,300 l. annually, and their yearly expences to 5,100 l. but a debt of 113,419 l. ſtill remained on them: for many of the above particulars we are indebted to *W. Moſs's Liverpool Guide*. In the year 1737

Worſley Brook was intended (and an act paſſed 10 Geo. II.) to be made navigable; and, in 1758, a branch of *Bridgewater*'s canal was intended to join at Hollin Ferry, but neither of theſe has been executed. In 1771 Mr. *James Brindley* propoſed an aqueduct-bridge over the eſtuary of the *Merſey* river, for the uſe of the intended *Liverpool and Runcorn* canal; and in 1801 Mr. *Ralph Dodd* tried to perſuade the adoption of a road-bridge over the ſame at Caſtle Rock near this place, 412 yards long, which he ſtated might be built for 47,000l. In 1799 it was ſuggeſted that a tunnel might be made under the *Merſey* at Liverpool to the oppoſite ſhore in Cheſhire, ¾ of a mile; in the ſame year it was in contemplation to build an aqueduct over the Irwell, for the uſe of the *Mancheſter Bolton and Bury* canal, to enable it to join *Bridgewater*'s canal; and in 1804 it was propoſed to bring the *Weaver* navigation to Weſton Point on this navigation, by a new ſide-cut, near that river from Frodſham, to avoid the ſhallows near the junction of the rivers. In 1758 the price of carriage on this navigation, between Liverpool and Mancheſter was 12 s. per ton, but on the completion of *Bridgewater*'s canal it fell to 6 s. per ton.

Milford Haven. This famous eſtuary and harbour for large ſhips, has nearly an eaſt courſe, for about 17 miles, in the county of Pembroke, in South Wales, commencing in St. George's channel, and terminating near Landſhipping ferry, where it is joined by the *Dougledge* and *Clelby* rivers: it has alſo creeks or branches extending to Pembroke, to near Carew Caſtle, to Creſwell, to Nangle, &c.

Monkland Canal. The general direction of this canal is nearly eaſt, for about 11½ miles in the county of Lanerk in Scotland, its eaſtern end is conſiderably elevated; its objects are the ſupply of Glaſgow, Paiſley, &c. with coals from Monkland collieries, and the export of farming products. It commences in the baſon of the branch of the *Forth and Clyde* canal, and thereby communicates with the *Clyde* river, and the *Edinburgh and Glaſgow* canal. Glaſgow is the 5th Britiſh town, with a population of 77,385 perſons. In 1803 the *Glaſgow and Saltcoats* canal was propoſed to connect with this at Glaſgow.

Monmouthshire Canal. Acts 32, 37, and 42 of Geo. III.—The general direction of this compound of canals and rail-ways is nearly north, for 17¾ miles, in the counties of Monmouth, and Brecknock in South Wales; its northern ends are very greatly elevated; its object is the export of coals, lime, and iron from the country through which it paſſes; near Pontypool it is joined by the *Brecknock and Abergavenny* canal, at Pill Gwenlly it joins to the *Sirhowy* tram-road (by means of the *Uſke* river), and at Count-y-Billa farm, and at Riſca, it joins the ſame again by different branches belonging to this company. Newport and Pontypool are conſiderable towns on this line. This canal commences in the tide-way of the *Uſke* river, near to the *Severn*, at Pill-Gwenlly, and terminates by a rail-way extenſion at Blaen-Afon iron furnaces, having alſo a principal branch of canal from the line at Crynda-Farm, near Malpas, and continued by a rail-way to Beaufort iron-works, 21 miles: from this branch are rail-way branches to Sorwy furnace, 1¼ mile, to Nant-y-glo works, 6¼ miles, and another to the Sirhowy tram-road at Riſca: from the line near Pontypool is a rail-way branch, 1 mile, to Tronſnant furnace, and another, of ½ a mile, to Blaen-Dir furnace. From the *Uſke* river to Pont-Newydd, 12½ miles, is a riſe of 447 feet by the canal, and thence to Blaen-Afon, 5¼ miles, is a riſe of 610 feet by the rail-way: from Crynda-Farm to Crumlin bridge the canal branch riſes 358 feet in 11 miles; thence for 3 miles to the rail-way bridge over Ebwy river, 3 miles, the rail-way has a riſe of 139 feet, and thence to Beaufort, 7 miles, it has a riſe of 480 feet; the Nant-y-glo branch has a riſe of 518 feet, along the ſide of Ebwy-Frach river. The locks are 60 feet long and 10 feet wide, their paddle-holes are, in ſome of them, united in the breaſt of the lock, and no ſheet-piling, or inverted arch has been made below the lower gates. Much deep-cutting and embankments have here been neceſſary, to obtain the proper ſlopes for the rail-ways and inclined planes. Mr. *Thomas Dadford* jun. is the engineer: in February 1796 the canal was completed from the *Uſke* to Pontypool, and in the ſame year the Beaufort branch was completed. This company were authoriſed by their different acts to raiſe 275,330l. in 100l. ſhares: in 1802 theſe divided 2l. 12s. 6d. each annually; it is provided, that after the profits amount to 10 per cent. and 1000l. is accumulated as a fund, the tolls are to be reduced, firſt on coals, ſo as to keep the profits within that amount. The tolls and exemptions are various, and may be conſulted in *Phillips's* 4to. *Hiſtory*, *Appendix*, p. 18 and 19, where tolls are ſpecified for cattle paſſing on the rail-ways. Nine miles of the *Sirhowy* tram-road was made by this company, who receive the tolls thereof, as alſo 110l. per annum from that company, on account of the junctions therewith: to the *Brecknock and Abergavenny* company this company paid the ſum of 3000l. for the benefit of their junction herewith, and their taking the ſame tolls only on goods paſſing on it from this canal as are charged hereon. Rail-way branches may be made to any works within 8 miles of this canal or its branches. In the year 1805 it was propoſed to continue this canal lower down the *Uſke* river, to avoid its imperfect navigation.

Montgomeryshire Canal. Act 34 Geo. III.—The general direction of this canal is nearly S.W. for 27 miles in the county of Salop and of Montgomery in North Wales; it is conſiderably elevated, particularly its ſouthern end; its objects are the ſupply of the country with lime, the export of its farming products and of coals, ſlate, free-ſtone, iron, lead, &c. from different parts near the line: it connects with the *Severn* river at Welſhpool. Welſhpool, Montgomery, and Newton are conſiderable towns on or near this canal: it commences in the Llanymynach branch of *Elleſmere* canal, at Portywain lime-works in Llanyblodwell, and uniting with the ſame again near Verniew river in Llanymynach, it terminates at Newtown: it has a cut of 3¾ miles to the *Severn* river at Welſhpool and to Guilsfield. From the *Elleſmere* branch to Newtown is a lockage of 225 feet: the Guilsfield cut is level. Mr. *Thomas Dadford* jun. is the engineer. In Auguſt 1797, 16 miles of the canal were finiſhed and opened from the *Elleſmere* branch to Garthmill near Berriew. The company were authoriſed to raiſe 92,000l.; the amount of each ſhare 100l. The water of Lledan Brook is to be taken to ſupply this canal for 24 hours weekly, from Saturday to Sunday evening; the company are bound to purchaſe certain mills, if their trade is injured by the canal: and certain creditors on turnpike tolls near the canal are alſo indemnified: the profits are not to exceed 10 per cent. but the tonnage is to be reduced, but not ſo as to bring the profits below 8 per cent.: the rates of tonnage and exemptions are various: ſee *Phillips's* 4to. *Hiſtory*, *Appendix*, p. 151 and 152. About the year 1794 the *Welſhpool and Leominſter* canal was propoſed to join this near Welſhpool.

Neath Canal. Acts 31 and 38 Geo. III.—The general direction of this canal is nearly N.W. for about 14 miles in the county of Glamorgan in South Wales; and its northern end is conſiderably elevated; its object is the export of coals, iron, lime-ſtone, &c. from the mines and works near the line; which commences in the tide-way of the *Neath* river, at Giants-grave pill in Briton's-Ferry, and terminates in the *Aberdare* rail-way branch at Abernant near Furno

Vaughan: being joined near Briton's Ferry, in the *Neath* river, by the *New Chapel* canal. Neath is the only conſiderable town on this line; near Merlin's Court is an aqueduct over the Neath river. This company were authoriſed to raiſe 35,000l.; they are authoriſed to make rail-way branches to any place within 4 miles of the line, by conſent of the land-owners. In 1798 this canal was nearly finiſhed, except about two miles at the lower end. Here is a ſingular proviſion, that the rates of warehouſe-room are to be the ſame as are charged by the *Staffordſhire and Worceſter* company at the Stourport warehouſes.

NEATH RIVER. The general direction of this navigation is nearly N. for about 4 miles in the county of Glamorgan, in South Wales: the tide flows through its whole length from Swanſea bay to Neath bridge; at Giants-grave pill near Briton's Ferry it is joined by the *Neath* canal, and near Briton's Ferry by the *New Chapel* canal; its chief objects are the ſupply and trade of Neath, and the export of the coals and iron brought down by the canals.

NEN RIVER (*lower diſtrict.*) Acts Geo. II., and 34 of Geo. III.—The general direction of this navigation is about S.W. by a very crooked courſe of nearly 75 miles in the counties of Cambridge and Huntington, and ſkirting thoſe of Lincoln and Northampton; this is by what appears to have been its ancient courſe through the Fens, beginning in the tide-way at Peter's point about 9 miles below Wiſbeach, paſſing that town, where is a bridge built of ſtone with one flat ſemi-elliptic arch of 70 feet ſpan; and turning ſouth-eaſtward by an ancient courſe (which is now rendered uſeleſs to navigators by the *Wiſbeach* canal, which joins this river at Wiſbeach and again at Outwell), to Outwell and Apwell, thence to March and Benwick, thence through Ramſey, Ugg, and Whittleſea Meers, through Horſey-bridge, and Standground ſluice to Peterborough, and thence by the regular channel of this river to the commencement of the upper *Nen* navigation at Thrapſton; in after times, a navigable courſe has been opened, for part of the waters of this river through Well-Creek, about 5 miles in length, from near Outwell-church to the Great *Ouſe* river at Salter's-Load; another from Standground (1½ mile below Peterborough) through Catt-Water and Shire Drain of about 24 miles in length to the *Nen* river again at Gunthorpe-ſluice (about 6½ miles below Wiſbeach), this laſt having a cut of about 2 miles in length from it into the old *Welland* river near Crowland; in 1490, biſhop Moreton cut a new ſtraight courſe 40 feet wide and 13 miles long, called Moreton's Leam, for a part of theſe waters, from Standground ſluice (about 2 miles below Peterborough) to near Guyhirne, and thence 3 miles by an old channel to the *Nen* again near Wiſbeach; alſo, at Benwick this river is joined by the Benwick-Meere branch, of the Great *Ouſe* river. The above will ſerve to give ſome idea of the principal lines of navigation belonging to this river through this ſurprizing country; but as all the rivers, and all drains almoſt in the fens are embanked on both ſides, and owing to the deficiency of fall are almoſt ſtill water, there are a great number of ſmaller navigable branches interſecting and croſſing each other in all directions, ſo that it would be in vain for us to attempt to deſcribe them. The powers of the commiſſioners under the above acts, extend only about 30 miles downwards to Peterborough bridge; the navigations through the fens are preſerved by the fen corporation in maintaining their drainage works. In 1721, Mr. *Nathaniel Kinderley* recommended the cutting of a new channel or outfall for this river (as has been ſince ſucceſſively practiſed by him on the *Dee* river at Cheſter) from the mouth of Shire-drain at Gunthorpe-ſluice ſtraight along the N.W. ſhore for 2 miles to Peter's point; and the work was begun, but the miſtaken notions of the people of Wiſbeach then, and till lately, prevented its completion: we are glad, however, to hear, that the ſame is likely now to be ſoon accompliſhed, and a greater depth of water obtained in this river, and through Croſs-keys waſh to Lynn and Boſton deeps. By the act for *Wiſbeach* canal 34 Geo. III., all veſſels paſſing out of or into that canal from the *Nen* are to pay 3d. per ton, out of which 100l. is to be paid annually to the commiſſioners under the above acts for improving this river above Peterborough, and the remainder is to be applied to deepening and improving the ſame between the *Wiſbeach* canal at Outwell and the *Ouſe* river at Salters-Load. Boats which have paid the above toll are to paſs toll free at Salters Load, and Standground ſluices on this river.

NEN RIVER, (*upper diſtrict.*) The general direction of this navigation is nearly S.W. for about 23 miles, in Northamptonſhire: it is not greatly elevated; its objects are the ſupply of Northampton and the ſurrounding country with coals, deals, &c. and the export of agricultural productions. The communication between Lynn, London, Liverpool, Mancheſter, &c. which it now effects is alſo important. Northampton is the 85th Britiſh town with a population of 7,020 perſons, Wellingborough, Thrapſton, and Higham-Ferrers, are alſo conſiderable towns on or near this river; it commences in the lower *Nen* navigation at Thrapſton, and terminates at the rail-way branch of the *Grand Junction* canal at the town of Northampton, where alſo it is to be joined by the *Leiceſterſhire and Northamptonſhire Union* canal. This navigation has been improved by a great number of ſide-cuts and pound-locks by the ſide of the river in different places; it was completed and opened to Northampton on the 7th of Auguſt 1761. About the year 1793, the *Leiceſter and London* canal was propoſed to croſs this river near Wellingborough.

*Newark and Bottesford.* In the year 1793, a canal was intended from the *Dean* river at Newark to the long level of the *Grantham* canal at Stainwith, paſſing near the town of Bottesford. In the *Grantham*, act 33 Geo. III., the tolls are provided that are to be paid at the junction of theſe canals, if this is ever executed.

*Newcaſtle and Carliſle.* In the year 1795, Mr *William Chapman* ſurveyed the line for a canal from the *Tyne* river at Newcaſtle to the *Eden* river at Carliſle, through Durham, Northumberland, and Cumberland, croſſing the grand-ridge for a connection between the eaſt and weſt ſeas; and having a collateral branch of narrow canal and inclined planes to the elevated mining diſtricts of Weardale and Teeſdale foreſts, &c. the eſtimate being 355,067l. On the rejection or ſuſpenſion of this ſcheme, a canal from *Newcaſtle to Haydon-bridge* was propoſed as below.

*Newcaſtle and Haydon-Bridge.* In 1796, and again in March 1802, it was in contemplation to make a canal nearly following the courſe of the Tyne river, between Newcaſtle and Haydon, in Northumberland and Durham.

*Newcaſtle and Maryport.* Some years previous to 1801, a canal was projected between the tide-way in Maryport harbour and the *Tyne* river at Newcaſtle, croſſing the grand ridge, and paſſing between the two ſeas, though Cumberland and Durham counties: a bill for the ſame was brought into parliament, but rejected, owing to the oppoſition that the favourers of another ſcheme gave to it: in 1801, the ſcheme was again revived, but nothing effectual has been done towards its adoption.

NEWCASTLE (*under-line*) CANAL. Act 35 Geo. III.—The general direction of this navigation is nearly weſt, by a very bending courſe of 3 miles, in the county of Stafford: its objects are the bringing of Caldon lime for manure, and the export of coals and farming products: it is conſiderably elevated. Newcaſtle is a conſiderable town, and its neighbourhood very populous. This canal commences in the *Trent and Merſey* canal (near to the end of the Caldon branch) at Quinton's Wood, in Stoke, and terminates in the *Newcaſtle under-line Junction*, at the ſouth-eaſt corner of Newcaſtle town. It was completed in a ſhort time after the act was obtained, the company being authoriſed to raiſe 10,000 l.; the amount of ſhares therein is only 50 l. each. The rates of tonnage and wharfage are on coals, lime-ſtone, and iron-ſtone 1½d. per ton per mile, on all other goods 2d. per ton per mile, but for leſs than a ton of any article in a boat 6d. Between December and the 1ſt of April this company may take flood waters from the Trent river.

NEWCASTLE (*under-line*) JUNCTION CANAL. Act 38 Geo. III.—The general direction of this canal is about N.W. for a ſhort diſtance, in two detached parts, in the county of Stafford: its weſtern ends are much elevated, and terminate near the grand ridge on its eaſtern ſide: its object is the export of coals and agricultural produce. Newcaſtle is a conſiderable town on its line. It commences in the *Newcaſtle-under-line* canal, at the S. E. corner of that town, and terminates its eaſtern part in the canal of Sir *Nigel Bowyer Greſley*, near the S. W. corner of the town; its weſtern part commences in *Greſley*'s canal above mentioned, near Apedale, and extends to Partridge-Neſt collieries, with a branch to Bignel-End collieries. This company were authoriſed to raiſe 12,000 l., the amount of their ſhares being 50l. only: proviſion is made in the act for inclined-planes and water-levels, or rail-ways, with engines to raiſe water or draw trams, &c. in caſe any of theſe ſhould be found more eligible than a canal with locks, in any part. Pleaſure boats to pay for 6 tons if they paſs any lock. In 1796, the *Commercial* canal, for 40 ton boats, between the *Aſhby* and *Cheſter* canals, was propoſed to occupy or paſs through the line of this canal, when enlarged.

NEW CHAPEL CANAL. The general direction of this canal is eaſt, by a bending courſe of about 3½ miles, in the county of Glamorgan, in South Wales; the greater part of it is cut through a moraſs, but little above the level of the tide-way in which it commences, in the river *Neath*, near Briton's Ferry (near the entrance of the *Neath* canal), and terminates at New Chapel, near Swanſey: it is the ſole property of the owner of the land, and for whoſe improvement, by draining and otherwiſe, it was principally undertaken.

*Newport and Stone.* In June 1797, it was propoſed to make a canal from the *Donnington Wood* canal (the marquis of *Stafford*'s) at Pave-lane, near Newport, by Eccleſhall, to the *Trent and Merſey* canal, near Stone, a courſe of about 18 miles, in the counties of Salop and Stafford, croſſing the grand-ridge; a branch was propoſed to Market-Drayton: its object was the opening of a direct communication between Shrewſbury, and other places on or near the upper parts of the *Severn*, and the *Trent and Merſey* canal, for ſupplying the intermediate country with coals and lime, &c. In 1765, the *Tern-bridge and Winsford* canal was propoſed, and intended to paſs through nearly the ſame ground as the middle parts of this canal; as was alſo the *Sandbach* on an other occaſion.

NEWRY CANAL (*Ireland*). This canal, from the tide-way at Fadham point to the town of Newry, was completed under the direction of Mr. *Golborne*, in February 1761, after being two years in hand, by which brigs of 80 or 100 tons burthen can come up to Newry; it was intended to extend this to the *Blackwater* navigation, for conveying the Dungannon and Drumglaſs coals to Dublin; and the Iriſh parliament, between 1753 and 1771, granted different ſums of the public money for this purpoſe, amounting to 11,434l. but the work then was far from being completed.

NITH RIVER. The courſe of this river (ſometimes called the Nid) is nearly north for about 9 miles, between Dumfries and Kirkcudbright counties, in Scotland; the tide flows through its whole length, and its object is the ſupply of Dumfries, (the 79th Britiſh town, with 7,288 perſons); it commences in Solway Firth, and terminates at Dumfries bridge, which is of ſtone, with 13 arches. In 1760, Mr. *John Smeaton* was conſulted on the encroachments by jetties of ſtakes and ſtones for gaining land, that had been made at Cargin, Lagal, and Netherwood, on this river, and recommended the removal of ſome of theſe works at the projecting points of the river.

NOTTINGHAM CANAL. Act Geo. III.—The general direction of this canal is nearly N. W. by a crooked courſe of about 15 miles, in the county of Nottingham; it is not very greatly elevated: its objects are the export of coals from the ſeveral mines near it, and of farming products, importing lime, deals, &c. Nottingham is the 17th Britiſh town, with a population of 28,861 perſons. This canal commences in the river *Trent*, near Nottingham (oppoſite to the junction of the *Grantham* canal), and terminates in the *Comford* canal, near Langley bridge, and near to the termination of the *Erewaſh* canal: near to its ſouthern termination it is joined by the *Trent* canal or ſide-cut (from the *Trent and Merſey* canal). A reſervoir is made near Amſworth for the ſupply of this canal, and has a ſelf-regulating ſluice which lets out near 3000 cubic feet of water per hour for certain mills and the *Erewaſh* canal. In 1802, this canal was completed.

NUTBROOK CANAL. Act 33 Geo. III.—The general direction of this canal is nearly N. W. for 5 miles, in the county of Derby: it is not greatly elevated: its object is the export of coals from the mines near the line; which commences in the *Erewaſh* canal, near Stanton, and terminates at Shipley colliery; it has a branch to Weſt Hallam collieries. Sir Henry Hunloke and Edward Miller Mundy, eſq. were authoriſed to raiſe 19,500 l. between themſelves, in 100 l. ſhares; their profits hereon are not to exceed 8 per cent.; and proprietors of adjoining lands may make ſide branches thereto: the particulars of the tonnage rates are very long, including ſome regulations with the *Erewaſh* company, &c. See *Philips's* 4to. *Hiſtory*, *Appendix*, p. 104 and 105.

OAKHAM CANAL. Acts 33 and 40 Geo. III.—The general direction of this canal is about S. E., by a crooked courſe of 15 miles, in the counties of Leiceſter and Rutland: its ſouthern end is conſiderably elevated, croſſing the Tilton and Burley branch from the grand-ridge: its objects are the ſupply of Oakham, and the country through which it paſſes, with coals, deals, &c., and the export of agricultural products. Oakham and Melton-Mowbray are conſiderable towns on this line, which commences in the *Leiceſter and Melton-Mowbray* navigation, at Melton-Mowbray, and terminates at the town of Oakham. From the *Leiceſter and Melton-Mowbray* navigation to Edmondthorpe, 8½ miles, it has a riſe of 126 feet; the remaining 6½ miles to Oakham are level, and it is fed by a reſervoir for flood-waters in Langham, and another in Saxby. The engineers were Mr. *William Jeſſop* and Mr. C. *Stavely*, jun. In November 1800, this canal was opened from Melton-Mowbray to Saxby bridge, and in January 1803, the whole was completed. This company was authoriſed to raiſe 86,000 l. in 100l. ſhares. The rates of tonnage and wharfage, with the exceptions therefrom, may be ſeen in *Phillips's* 4to. *Hiſtory*, *Appendix*, p. 106 and 107; but to which the laſt act made an addition, and the *Leiceſter and Melton-Mowbray* act, 40 Geo. III., alſo contains ſome regulations affecting the tolls at the entrance to this canal. Earl Winchelſea is to be paid 15l. annually, in lieu of his cuſtomary dues on coals ſold in Oakham town.

OUSE RIVER (*Lewes lower Navigation*). Act 31 Geo. III.—The general direction of this navigation is nearly north, for near 9 miles, in the county of Suſſex: the tide flows through its whole length: its objects are the import of coals, deals, &c. and the export of farming products. Lewes is a conſiderable town on this navigation; which commences in the Engliſh channel, at Newhaven harbour, and terminates in the upper *Ouſe* navigation, at Lewes bridge: the meadows, called Lewes and Laughton Levels, near this river, were ſubject to be overflowed, and it is part of the object of the above act to embank the river and its tributary ſtreams, and to erect proper ſluices, and cut drains for the improvement thereof; part of the money for which draining purpoſes, is to be raiſed by the commiſſioners of ſewers, under the act of 23 Hen. VIII., by different rates per acre on each of the five diſtricts into which the levels are by this act divided, but the works are to be performed by the truſtees appointed by this act, who, in 1802, completed the ſtraightening and deepening of the courſe of the river, ſo that the tides flowed higher and ebbed lower than before at Lewes bridge, and to which place veſſels drawing 4 feet of water can now come up. The tolls on articles navigated on any part of this river are to be, for manures not exceeding 2d. per ton, for road-materials 3d., and for all other goods 4d. per ton, empty boats to paſs toll free; theſe tolls are not to be lowered (except road-materials to 2d.), ſo long as 6,000l. of the money borrowed on the credit of theſe tolls and the acre-taxes, remain undiſcharged; the tolls are intended hereafter to be ſo reduced, that one-third of the whole expences of maintaining the navigation and drainage works ſhall be paid by the acre-taxes, and two-thirds by the tolls on the river; the acre-tax is, however, to make up the deficiency, if the above tolls are inadequate; lands below Newhaven bridge are not to be taxed, but to maintain their own banks. In the year 1762, Mr. *John Smeaton* was conſulted about improving the navigation and drainage of this river. About the year 1793, a new pier was built to protect the harbour of Newhaven, and the entrance of this river; in 1802, it was propoſed to add a new groin thereto to the weſtward, for the further ſecurity of veſſels; and, in 1804, it was in contemplation, by large ſtones from the neighbouring cliff, to extend a rough unwalled pier much further out into the ſea, for the ſecurity of veſſels on this coaſt.

OUSE RIVER. (*Lewes upper Navigation*). Act 30 Geo. III.—The general direction of this navigation is nearly north-weſt, by a bending courſe of about 22 miles, in the county of Suſſex: it is not much elevated above the level of the ſea: its objects are the import of coals, deals, &c. and carrying chalk and manures to the lands, and the export of their agricultural products. Lewes and Cuckfield are conſiderable towns on this line; it commences in the lower *Ouſe* navigation, at Lewes bridge, and extends to Hammer bridge, near Slaugham, with a branch to Offham chalk-pit, in Hamſay; the depth of water in every part is to be made 3½ feet: the boats to be 50 feet long and 12⅓ feet wide, and are not to paſs locks with leſs than 10 tons of lading. This company were authoriſed to raiſe 25,000l. in 100l. ſhares, and the works were not to commence until 10,000l. of this was ſubſcribed, and 10 per cent. thereon actually paid: it is to that public ſpirited and worthy nobleman lord *Sheffield* that the country are in a principal degree indebted for bringing about this uſeful meaſure. From Lewes bridge to Barcome mill there was an old and imperfect navigation for ſmall boats; on this part of the line, the rates of tonnage are to be, on manures, road-materials, timber, grain, &c. ½d. per ton per mile, and on all other goods 1d. per ton per mile; on the remainder or new part of the line, manures, &c. as above, are to pay 1d. and other goods 1½d. per ton per mile. Empty boats to pay 1s. for paſſing each lock, and pleaſure boats 3d. below and 6d. above Freſhfield bridge for paſſing locks. Between Old Eye, in South Malling, and Land-Port, no toll is to be taken, on goods carried no farther. Branches may be made to any place within 2000 yards of this river, on which the powers of the commiſſioners of ſewers (23 Hen. VIII.) ſtill continue. In 1801, it was propoſed to make an extenſion of the *Surry iron rail-way* to join this navigation at Linfield. In 1802, the navigation was not completed up to Hammer bridge; but, in the following year, it was ſaid that a new act for further powers for that purpoſe was in contemplation.

OUSE (*great*) RIVER. The general direction of this river is nearly S. W., by a crooked courſe of about 84 miles, in the counties of Norfolk, Cambridge, Huntington, and Bedford, and ſkirting Suffolk for a ſhort diſtance: this courſe through the fens being from the tide-way in Lynn-deeps, (2 miles below that town), paſt Lynn, Telney, Salter's Load, Denver-ſluice, Rebeck, Little-port-chair, Ely, Harrimere, Hermitage-ſluice, Erith, and thence by the regular channel of this river to Bedford. Soon after the year 1630 (in conſequence of a law of ſewers of the 13th of January, 6 Charles I.) the old Bedford river, (a ſtraight cut, of 21 miles long and 70 feet wide), was made, between Hermitage-ſluices and Salter's-Load, for conveying part of the waters of this river; and in 1652, the ſcheme of Sir *Cornelius Vermuyden* for another navigable cut nearly parallel to the laſt was carried into effect, (under the authority of an act of Cromwell, 1649, confirmed afterwards by 15 Charles II. eſtabliſhing the fen corporation); this laſt, called the New Bedford river, is 20 miles long and 100 feet wide, from Hermitage ſluices to Denver's ſluice, both theſe new cuts falling into the great *Ouſe* river again, at Salter's-Load and Denver's ſluice (which are within about a mile of each other, and 17 miles from Lynn); beſides theſe, part of the waters of this river make their way by a navigable cut of about 12 miles in length, from Hermitage into the *Nen* river at Benwick. In 1725, Mr. *Thomas Badeſlade* mentioned, and, in 1751, Mr. *Nathaniel Kinderley* ſtrongly recommended, another ſhorter cut between Eaubrink and Lynn, for ſtraightening the courſe of this river, for which the acts of the 35, 36, and 45 of Geo. III. have been paſſed, called the Eaubrink cut, and on which Mr. *Robert Mylne*, ſir *Thomas Hyde Page*, and captain *Joſeph Huddart* are employed as engineers; this cut was, in September 1804, marked out, and is intended to be 296 feet wide at the eaſt end, 204 feet at the weſt end, and about 2¾ miles in length, making eaſy bends into the river at each end, with banks on each ſide, at a diſtance from the cut, 6 feet higher than the ordinary tides, of 15 feet riſe, with an embankment and ſluice acroſs the old channel, above the eaſt entrance of the new one; which important works ere long, we hope, will be completed. Near the harbour of Lynn this river is joined by the *Lynn* river; at Salter's-Load, by a branch of the *Nen* navigation (called Well Creek); between Salter's-Load and Denver's ſluice it is joined by *Stoke* river; at Rebeck the little *Ouſe* joins; at Prick-willow the *Lark* river joins; near Barkway chapel the *Soham-Lode;* at Harrimere, the *Cam* river joins; and at Temsford the *Ivel* river alſo joins: the whole of the rivers and large drains in the theſe fens being embanked and nearly level; there are many others of them navigable for ſhort diſtances beſides the above. Lynn is the 50th Britiſh town, with a population of 10,096 perſons: Downham, Ely, St. Ives, Huntingdon, St. Neots, are alſo conſiderable towns on this line. Denvers dam and ſluice, with 5 eyes or arches, was built acroſs the great *Ouſe* river, juſt above the entrance of the new Bedford-river, in the year 1651; in 1713, the water having undermined three of the arches, they were carried away, and were not rebuilt again until 1746. At Willington and others of the mills in the upper parts of this navigation, there is a kind of ſelf-acting ſluices in uſe, which fall down to let the water paſs freely over them, when the water in a flood riſes above a certain height; the locks on this part of the navigation are of wood, the towing-path has ſtiles near it, and is frequently interrupted as before mentioned. In November 1790 a dry dock in Lynn, connecting with this river, was opened, being the firſt work of the kind which had been erected for the accommodation of that port. About the year 1780, a cut, of about $1\frac{1}{2}$ mile in length, was made from this river, in Willington, to the turnpike road in Cople, where a houſe and conveniencies for a wharf were built (now the Dog ale-houſe) at a great expence; but the conſent of the proprietor of the *Ouſe* navigation, who holds it under a particular grant from the crown, could not afterwards be obtained for this cut being uſed as a navigation. In 1785, and again in 1802, the *London Lynn and Norwich* canal was propoſed to join this river at Lynn. And in 1792, the *Leiceſter and London* was propoſed to join and croſs it at Bedford.

Ouse (*Little*) River. This river (often called the Brandon) has its courſe nearly eaſt, for about 20 miles, between the counties of Norfolk and Suffolk: it is not greatly elevated in any part: its objects are the import of coals, deals, and the export of agricultural products. Brandon and Thetford are conſiderable towns on this river, which commences in the great *Ouſe*, at Rebeck, and terminates at the town of Thetford, to which place boats with 14 or 15 chaldrons of coals in each could come up in the year 1649. The lower part of this river for ſeveral miles is embanked on both ſides, through the fens. In the year 1789, this navigation was propoſed to be joined at Hiſs near Wilton by the intended *Biſhopſtortford and Wilton* canal.

Ouse River (*York*). Act 23 Henry VIII.—The general direction of this river is nearly north-weſt for about 48 miles, between the Eaſt, Weſt, and North Ridings and Ainſty Liberty in Yorkſhire; it is not very greatly elevated in any part; its objects are the trade and ſupply of the city of York, and of the immenſely populous and trading diſtricts in the Weſt Riding. At Goole-Bridge it is joined by the *Don* river; at Armyn, by the *Ayre and Calder* navigation; at Barnby, by the *Derwent* river; at Selby, by a cut of the *Ayre and Calder* navigation; near Cawood, by the *Wharfe* river; and at York, by the *Foſs* river. York is the 23d Britiſh town, with a population of 16,145 perſons. Howden, Snaith, Selby, and Cawood are alſo conſiderable places on or near this river; which commences in the *Humber* river at Trent-fall (the junction of the *Trent* river) to the *Yore* river at Linton. Ships of 150 or 160 tons burthen come up to Armyn, and ſmaller maſted veſſels to York city. By a licence of Richard II. the corporation of York are required to maintain certain bridges on the upper part of this river. In the year 1795, a large wooden draw-bridge, of 13 openings, was built by Mr. *William Jeſſop* over this river at Selby, under an act of parliament. In 1769, the *Selby and Leeds* canal was propoſed to connect with this river at Selby.

Oxford Canal. Acts 9, 15, 26, 34, and 39 of Geo. III.—The general direction of this canal is nearly north, by a very crooked courſe in its northern half, of 91 miles, in the counties of Oxford, Warwick, and Northampton; it croſſes the grand-ridge by a tunnel, and its northern part ſkirts along near to it on the weſtern ſide for many miles; its objects were a communication between the midland canals and the metropolis, (but a much nearer route is now opened by the *Grand-Junction* canal,) the ſupply of the northern parts of Oxfordſhire with coals, the export of farming products, &c. At Woolvercot is a cut of about $\frac{1}{4}$ mile (belonging to the duke of Marlborough), by which a communication with the *Thames and Iſis* navigation at Godſtow is effected. At Napton the *Warwick and Napton* canal joins this; and at Braunſton the *Grand-Junction* canal joins. Coventry is the 24th Britiſh town, with a population of 16,034 perſons; and Oxford is the 38th, with 11,694 perſons. Woodſtock, Deddington, Banbury, Southam, Daventry, and Rugby are alſo conſiderable towns on or near to this line of canal; which commences in the *Thames and Iſis* navigation at Badcock's Garden on the weſt ſide of Oxford city, and terminates in the *Coventry* canal at Longford. At Hillmorton and at Napton are ſhort cuts, of about $\frac{1}{2}$ a mile each, to the ſteam-engines belonging to this company. From the *Thames and Iſis* at Oxford to Banbury, $27\frac{1}{4}$ miles, is a riſe of 118 feet by 18 locks (including 2 weir-locks and an entrance lock from the Iſis); thence to Claydon, $7\frac{1}{4}$ miles, is a riſe of $77\frac{1}{3}$ feet by 12 locks; thence (through the Fenny-Compton tunnel) the ſummit pound continues to Marſton-doles wharf $10\frac{3}{4}$ miles, and level; thence to Napton on the hill 2 miles, is a fall of $55\frac{1}{4}$ feet by 9 locks; thence to Hillmorton, $16\frac{3}{4}$ miles (in which the *Warwick and Napton* and the *Grand-Junction* join), is level; thence in $\frac{1}{2}$ a mile is a fall of 19 feet by 3 locks; thence to the *Coventry* canal at Longford, $26\frac{1}{2}$ miles, is level. The two ſhort cuts to the engines, and that at Woolvercot, are level. This canal is 28 feet wide at top, 16 feet at bottom, and $4\frac{1}{2}$ feet deep, except the ſummit pound, which is made 6 feet deep in order to act as a reſervoir; the locks are $74\frac{3}{4}$ feet long, and 7 feet wide. At the toll-houſe near Longford is a ſtop-lock, to prevent the *Coventry* canal in dry ſeaſons, from lowering the water in the long pound on this; from which long pound an engine at Hillmorton pumps water into the Braunſton pound, by means of a feeder; and out of this laſt pound by means of a ſough. Another engine at Napton pumps into the ſummit pound, which is alſo fed by three reſervoirs. The number of ſtone and brick bridges on this line is 188, and of wooden, ſwing, draw, and foot bridges 66. The Fenny-Compton tunnel is 1188 yards long, $9\frac{1}{3}$ feet wide, and $15\frac{1}{2}$ feet high. At Newbold is a tunnel 125 yards long, made under the church-yard and ſtreet, 16 feet high, and $12\frac{1}{2}$ feet wide, with a towing-path through it. At Wolfhamcote, alſo, there is a ſhort tunnel. At Pedlars-Bridge near Brinklow is an aqueduct bridge of 12 arches, of 22 feet ſpan each. At Coſford on the Swift river, and at Clifton on the Avon, are others of 2 arches each; at Wolfhamcote, Adderbury, and Hampton-Gay, are other ſmaller aqueducts. Mr. *James Brindley* made the ſurvey for this canal in September 1768; in Auguſt 1769 he began the work near Longford; and in 1775 it was completed from thence to the Napton locks; when 122,300l. having been expended, the works ſtood ſtill for want of money until 5th April 1786, when they were reſumed; on the 31ſt of March 1778 the line was opened northward to Banbury; and on the 1ſt of January 1790 the whole was completed. Mr. *James Barnes* was employed to execute ſome of the digging of this part. This company have been authoriſed to raiſe, by their different acts, 330,000l.; the amount of their ſhares is 100l. each. In January 1800 theſe are ſaid to have ſold for 194l., and in 1802 for 275l. each; the *Grand-Junction* company being bound to make up the tolls hereon to 10,000l. annually, (if the works are kept in order) on condition of this company taking only certain tolls on goods paſſing to or from that canal, (ſee *Phillips*'s 4to. *Hiſt. Apend.* p. 32.) and agreeing to widen about 35 miles of their canal and lock[illegible] large boats may paſs north of [illegible]mton, whenever the *Grand-Junction* company ſhall re[illegible] and the *Coventry* company. The rates or tonnage are [illegible] complicated; they will be found in *Cary's Inland Navigation*, pages 59, 74, and 80. For parcels under [illegible] cwt. the company are to fix ſpecific rates in their printed tonnage tables. Coals from the inland pits were not allowed, by the firſt act above, to come nearer to London than Oxford; but by the 3d act, this was extended to Reading and the *Kennet* navigation; and in the year 1800 this company offered 2s. per ton as a premium on coals carried certain diſtances from their canal into Berkſhire, &c. The narrow barges uſed on this canal ſeldom venture down the *Thames* to London, but goods are generally ſhifted at Oxford into the Thames-barges. About the year 1792 the *Stratford and Croperdy* canal was propoſed to join this at Croperdy; and, at the ſame time, a canal from *Hampton-Gay to Iſleworth* was intended, to join this at Hampton-Gay.

PARNEL'S CANAL. This ſhort canal, or rather water-level, has nearly a north direction for about ½ a mile in the valley north of St. Auſtle, (near the ſouth coaſt of Cornwall) one mile above that town; it commences within an immenſe excavation of great depth, and open to day, which has, by the work of ages, been made in a rocky hill abounding with tin ore. It is tunnelled through the ſolid rock for 200 yards or more, on a level to the ſurface of the hill, and proceeds forwards thereon to the top of an inclined plane, of about 50 feet fall, where the boats are raiſed up an end by a windlaſs to ſhoot out the ore, as already deſcribed on *St. Columb* canal. At the bottom of the plane the ore is loaded into carts, to be carted to the ſtamping-mills. Small ſquare-headed boats are uſed, and four or five of them are linked together to be ſhoved through the tunnel, by means of chains which are fixed along its ſides for that purpoſe, and they are afterwards towed along the canal to the head of the plane. This canal, tunnel, and plane, were made at the expence of Mr. *Parnel*, who owns the mine, about the year 1770, before which the ore was drawn up to the top edge of the pit or mine, and carted from thence.

PARRET RIVER. The courſe of this river is nearly ſouth-eaſt for about 5 miles, in the county of Somerſet; it is not greatly elevated; its objects are the import of coals, and the export of agricultural products. Langport is the only conſiderable town near this navigation. It commences in the *Tone and Parret* navigation at Borough-Chapel, and terminates in the *Ivelcheſter and Langport* navigation, a little below Langport.

PEAK-FOREST CANAL. Acts 34, 40, and 45 of Geo. III.—The general direction of this canal and rail-way is nearly ſouth-eaſt for 21 miles, in the counties of Cheſter and Derby; its ſouthern end is very conſiderably elevated, and terminates on, or very near to, the Grand-Ridge; its principal object is the export of the Peak-Foreſt lime, and of coals from the neighbourhood of this canal. Aſhton-under-line, Stockport, and Chapel-le-Frith are conſiderable towns on or near this line; which commences in the *Mancheſter Aſhton and Oldham* canal, at Duckenfield, (near to the termination of the *Huddersfield* canal,) and the canal terminates at the baſon and lime-kilns in Chapel-Milton, whence a rail-way proceeds to Loads-knowl lime-ſtone quarries in the Peak. The line of the canal is 15 miles in length, and of the rail-way 6 miles; there is a cut of ½ a mile to Whaley-Bridge, and a rail-way branch of 1½ mile to Marple. Over the Merſey river, near Marple, is a grand aqueduct bridge of 3 arches, each 60 feet ſpan and 78 feet high, the whole height of the ſtructure being near 100 feet, which was built in the year 1799. (This bridge we have before, by miſtake, when treating of Aqueducts, mentioned as being on the *Mancheſter Aſhton and Oldham* canal.) Mr. *Benjamin Outram* was the engineer, and the works were completed on the 1ſt of May 1800. The company were authoriſed to raiſe, by the firſt act, 150,000l., each ſhare being 100l., which in 1802 bore a premium of 10 per cent. It has been ſaid, on ſeveral occaſions, that this canal and rail-way were completed at 10 per cent. under the original eſtimate, and that the 2d act authoriſed the company to raiſe any unlimited ſum that they might want, in which there certainly were miſtakes, becauſe the act of the laſt ſeſſions was for raiſing a further ſum of money. For the rates of tonnage and wharfage, ſee *Phillips*'s 4to. *Hiſtory, App.* p. 155. Mine-waters may be uſed for the ſupply of this canal, but only the flood-waters of the rivers.

PENTLAND FIRTH. This ſtreight has nearly a weſt direction between Caithneſs county, at the north-eaſtern extremity of Scotland, and the Orkney iſlands. This, though a rocky and dangerous paſſage, is much frequented by ſhips, on account of being the firſt paſſage which preſents itſelf for ſhips in going northward, between the Eaſt and Weſt Seas, or German Ocean and Iriſh Sea. The *Inverneſs and Fort-William* canal, now cutting a great way ſouth of this for the uſe of ſhips, is expected much to leſſen the uſe of this firth. Serabſter road-ſtead, on the ſide of this firth, is a harbour much frequented by ſhips in blowing weather. Thurſo harbour in Caithneſs, on the ſouthern ſide of this firth, has a pier now building, and its harbour improving, under an act of 42 of Geo. III.

POLBROCK CANAL. Act 37 of Geo. III.—The general direction of this canal is nearly ſouth-eaſt for about 5 miles in Cornwall, near its north-weſt coaſt; it is not greatly elevated; its objects are the import of coals, and the export of ſtone and agricultural products. Bodmin is a conſiderable town near it. It commences at Guinea-port, near Wade-bridge, in the *Camel* river, and terminates at Dunmeer Bridge and Stoney Lane, in the pariſh of Bodmin, having a collateral cut of ½ a mile to Ruther Bridge, in the ſame pariſh. At Guinea port and at Stoney-Lane Bridge large and convenient baſons and warehouſes are intended. Mr. *John Rennie* and Mr. *Murray* are the engineers. This company may raiſe 18,000l. in 50l. ſhares. A feeder from the Camel river and any ſprings within 2000 yards may alſo be taken for this canal.

POOLE HARBOUR. This ſpacious inlet or harbour has nearly a weſt courſe for about 9 miles, in the county of Dorſet; the tide flows into every part of its various branches and inlets, and round Brankſea iſland, which is in the middle of it; its object, beſides the general trade and ſupply of the neighbourhood, is the export of a fine potter's clay found near to Corfe Caſtle, in the iſle of Purbeck, and paving-ſtones and free-ſtone from thence. Poole, Wareham, and Corfe Caſtle are conſiderable towns near this harbour, which commences in Studland Bay and terminates at Wareham Bridge: a branch proceeds about 2¼ miles north to Creek-Moor. In 1797 ſeveral improvements in this harbour were in contemplation.

PORTSMOUTH HARBOUR. This inlet or harbour has nearly a north courſe, for about 5¼ miles, in Hampſhire; the tide flows through it, and the depth of water in moſt parts of it is ſufficient for the large ſhips of the Britiſh navy. Portſmouth is the 13th Britiſh town, with a population of 32,166 perſons; Goſport and Fareham are alſo conſiderable towns adjoining it. It commences at Spithead, in the Channel, between Hampſhire and the Iſle of Wight, and terminates at Fareham Bridge, having alſo a branch to Coſham, and a communication therefrom to Langſtone and Chicheſter harbours. On the ſhores of this harbour there are immenſe buildings and works, for the uſe and ſecurity of the royal navy. In 1805 ſeveral conſiderable additions were making to theſe works, and a bridge between Goſport and Haſlar hoſpital, which Mr. Robert Forbes built ſome years ago, is intended to be taken down, having proved injurious to the harbour.

*Portſmouth and Croydon Canal.* In the years 1802 and 1803, a canal was in contemplation from *Portſmouth Harbour* to the *Croydon Canal* at that town, paſſing Havant, Chicheſter, Arundel, Horſham, Ryegate, and Merſtham, of which that able engineer, Mr. *John Rennie*, prepared plans and an eſtimate; but the oppoſition of the land-owners, and favourers of a rail-way ſcheme from *Portſmouth to London* procured its rejection in parliament. The ſummit-level of this canal was to be 36 miles in length, at about 220 feet above the level of the ſea: this was to be fed by ſeveral reſervoirs in or near Horſham Foreſt, containing in the whole 500 acres, and 340,000,000 cubic feet of water. This level was to penetrate the Chalk-Hills north-eaſt of Merſtham, by a tunnel 4¼ miles long, and 350 feet below the top of thoſe hills. The eſtimated expence was 721,000l., and 800,000l. in 100l. ſhares was propoſed to be raiſed; the expected revenue was eſtimated at 100,000l. per annum. While this line was in contemplation, there was an attempt made by Mr. *Ralph Dodd* to draw the public attention to a different line of canal, (which Mr. *John Phillips* laid claim to, as being one of the fanciful ones which he has drawn in the map to his 4to. Hiſtory, 1791,) from *Portſmouth Harbour*, through *Southampton Water* and the *Itchen River*, to Wincheſter; thence to Alresford, near to Alton and Farnham, and to the Wey river at Godalming: from near Weſtley on that river, the propoſed line of the *Grand Surrey* canal was to be followed to Deptford and the *Thames* river. The eſtimate mentioned on this occaſion was 348,735l.

*Portſmouth and London Rail-way.* In 1803, Mr. *William Jeſſop* was employed to ſurvey the line of a rail-way from Portſmouth town to the weſt end of Stamford-Street, near Blackfriars-Bridge, London; on the utility of which, and the *Portſmouth and Croydon* canal above, opinions were for ſome time divided: in the end, neither of them was adopted. The eſtimated expence of this work was 400,000l.

Ramsden's Canal. Act 14 Geo. III.—The general direction of this canal is nearly ſouth-weſt for about 8 miles, in the Weſt Riding of Yorkſhire; it is not very greatly elevated; its objects at firſt were the ſupply and trade of Huddersfield town, but it will ſhortly have conſiderable importance as part of the ſhorteſt line of navigation between Hull and Mancheſter and Liverpool. Huddersfield is the 81ſt Britiſh town, with a population of 7268 perſons. This canal commences in the *Calder and Hebble* navigation, at Cooper's Bridge, and terminates in the *Huddersfield* canal, at King's Mill near Huddersfield; it has a riſe of 56¾ feet by 9 locks. Sir *John Ramſden*, who is the ſole proprietor of this canal and of Huddersfield town, in 1766 employed Mr. *James Brindley* to plan this canal; and, after his death, it was begun and quickly completed by Mr. *Luke Holt*. At Huddersfield ſpacious warehouſes are built by the ſide of this canal, to which goods intended to be there lodged may be carried toll-free along the part of this canal from the *Huddersfield* canal; that company guaranteeing the tolls on this not to be leſſened thereby. On the whole length or any part of this canal, coals, flags, ſlates, ſtones, lime ſtones, and lime, are to pay a toll of 3d. per ton, and all other goods 1s. 6d. per ton, except dung and manures, which are to paſs free. The proprietors' profits are never to exceed 6 per cent. upon the monies laid out thereon.

*Reading and Maidenhead.* In 1770, a canal was propoſed from the *Thames* river, at Bolter's Lock near Taplow-Hill, (at the weſtern termination of the *Maidenhead and Iſleworth* propoſed canal,) to the *Thames* again, at Sunning near Reading and to the *Kennet* river, on which Mr. *James Brindley* was conſulted by the city of London, the diſtance being near 15 miles by the canal, and by the river above 30 miles, between the ſame places; a barge of 120 tons being 3 days (and often in dry times as many weeks) in performing the voyage, at an expence equal to 50l.; while, by this canal, it was calculated that a barge might at all times, except froſt, perform it in 6 hours, at 4l. 7s. expence, including ½d. per ton to the truſtees as a toll. This canal was at firſt propoſed to commence at Monkey iſland in the *Thames*, which is 2 miles below Maidenhead-Bridge. No private property was to be allowed in this canal, but the money was propoſed to be raiſed by life annuities, out of which, and the tolls, the river navigation was to be improved between Bolter's Lock and Sunning, without any new tolls being charged thereon; and when a ſufficient fund was accumulated for repairs and management, the tolls were to ceaſe, and the canal be entirely free.

Ribble River. The direction of this river is nearly eaſt for about 12 miles in the county of Lancaſter; the tide flows through its whole length: its objects are the ſupply and trade of Preſton town, and the export of coals brought down by the *Douglas* river, which joins it near Haſketh. Preſton is the 37th Britiſh town, with a population of 11,887 perſons. This river commences with a very wide eſtuary or mouth in the Iriſh Sea, but grows very ſhallow, ſo as to be fordable at low-water, and terminates at the bridge at Preſton, near to the aqueduct bridge, on which the *Lancaſter* canal croſſes this river. In September laſt, (1805) it was propoſed to apply for an act for placing buoys, and otherwiſe improving the navigation of this river.

Ripon Canal. Act 7 Geo. III.—The general direction of this canal is nearly N.W. by a bending courſe of about 7 miles in the Weſt, and ſkirting the North Riding of Yorkſhire: its objects are the ſupply of Ripon, and the export of agricultural products, ſtone, &c. It is conſiderably elevated; Borough-bridge, Ripon, and Aldborough, are conſiderable towns on or near this canal, which commences in the *Yore* river at Milby, near Borough-bridge, and terminates at Ripon.

Rochdale Canal. Acts 34, 40, and 44 of Geo. III.—The general direction of this canal is nearly N. E. by a bending courſe of 31½ miles in the counties of Lancaſter and York; it croſſes the grand-ridge by a deep-cutting: its general objects are the communication between Liverpool and Mancheſter, with Halifax, Wakefield, Hull, &c. the export of coals, paving-ſtones, &c. At Piccadilly ſtreet in Mancheſter it is joined by the *Mancheſter Aſhton and Oldham* canal. Mancheſter is the 2d Britiſh town, with a population of 84,020 perſons; Huddersfield is the 44th, with 10,671 perſons; Spotland the 55th, with 9,031 perſons; and Halifax the 58th, with 8,886 perſons. This canal commences in *Bridgewater*'s canal at Caſtle-Field in Mancheſter, and terminates in the *Calder and Hebble* navigation at the baſon, wharf and warehouſes at Sowerby bridge: to near Hollingwood chapel there is a branch of $\frac{3}{4}$ of a mile, and another of $\frac{1}{2}$ a mile to School-lane in Caſtleton near Rochdale. From *Bridgewater*'s canal to Piccadilly wharf, and the *Mancheſter Aſhton and Oldham* canal, 1$\frac{1}{8}$ mile, has a riſe of 75$\frac{1}{2}$ feet; thence to the Hollingwood branch, 4$\frac{3}{8}$ miles, has a riſe of 81 feet; thence to Failſworth brook, 2$\frac{3}{4}$ miles, is level; thence to the Rochdale branch, 4$\frac{1}{4}$ miles, has a riſe of 120 feet; thence to Clay-hall, 2$\frac{1}{4}$ miles, has a riſe of 62 feet; thence along the ſummit-pound and through the deep-cutting to Travis-mill, 5$\frac{3}{8}$, is level; thence to the *Calder and Hebble* navigation, 11$\frac{3}{8}$ miles, has a fall of 275 feet; the Hollingwood and Rochdale branches are level. From near Rochdale to Sowerby-Bridge there are 49 locks, (which are of the ſame width and length as *Bridgewater*'s at Runcorn:) more than 60 bridges and 8 aqueducts and large culverts. At Hallin's mill is a tunnel of 70 yards in length, 17 feet high and 21 feet wide, with a towing-path through it. At Dean-Head, between Littleborough and Todmerden, is a ſtupendous deep-cutting in hard rock, ſome of it 50 feet deep. A very large reſervoir is made on the weſt ſide of the ſummit, and an 100 horſe ſteam-engine is uſed to pump the water up to the ſummit-pound. On a bog on Blackſtone edge are two other large reſervoirs, one of them 14 yards deep. Gauges for regulating the ſtreams of the Roch, Irwell and Irk rivers, ſo that only their ſurplus flood-waters are taken for the ſupply of this canal, were contrived and erected by Mr. *John Rennie*, the engineer. Steam-engines within 20 yards of the canal are allowed to condenſe by its water. On the 28th of December 1798, the eaſt end of the line from Sowerby bridge to Rochdale was completed; on 18th September 1802, it was continued to Lomeſide wharf; and on 21ſt December 1804, the whole line was completed and opened to Mancheſter. This company are to pay a compenſation to the duke of *Bridgewater* for his warehouſes at Caſtle-Field, and to the *Calder and Hebble* company for their warehouſes at Sowerby bridge. This company were authoriſed by their firſt act to raiſe 391,000l. (the amount of ſhares 100l. each) and by the laſt act they were authoriſed to raiſe a large ſum in addition. The rates of tonnage and wharfage, and the exemptions in the firſt act, will be found in *Phillips*'s 4to. *Hiſtory*, pages 157 and 159, to 161; alſo, by the ſecond act, certain additions were made to theſe tolls. Cuts or rails-ways may be made to any preſent or future coal-mines near the line. In 1791 a branch from this canal was propoſed from near Todmarden (104 feet below the ſummit-level) to 2 miles beyond Colne, having a tunnel thereon of 1$\frac{1}{4}$ mile in length, about 3 miles N. E. of Todmarden.

ROTHER RIVER. The general direction of this river is nearly N.W. by a crooked courſe of about 19 miles in the counties of Suſſex and Kent; it is but little elevated above the ſea in any part: its objects are the import of coals, &c. and the export of oak-timber and agricultural products: near Rye harbour, oppoſite to Pleydon-heights, it is joined by the *Shorncliff and Rye* canal. Rye, Winchelſea, Appledore, and Tenterden are conſiderable towns on or near to this navigation; which commences in the tide-way of the Engliſh Channel near Rye old harbour, and terminates at Roberts-bridge; it has a branch of about 2$\frac{1}{2}$ miles to Winchelſea bridge, and ſome other navigable branches in the level fens which ſurround Oxney Iſland, and adjoin Romney-marſh. The harbour of Rye near the mouth of this river, from its tendency to choak up, formerly employed the abilities of captain *John Perry*, Mr. *John Smeaton*, and other eminent engineers; and under the acts of 29 Geo. I. and 1, 37, and 41 of Geo. III. ſeveral works have been conſtructed. Previous to the reign of Edward I., it is ſaid, that the *Rother* vented its waters into the ſea at old Romney harbour, about which time a new channel was cut for it to ſea at old Rye-harbour, which for a long time ſcoured itſelf out, and was deep enough for the uſe of large veſſels, the tide flowing 24 miles up the river; but ſea-ſluices being afterwards erected in improper ſituations, and embankments made, by which (before 1698) the channel became too ſhallow for ſhips, and in 1719 it was rendered quite uſeleſs for navigation; ſoon after 1721, the ſluices above mentioned were removed, but the evil was become ſo irreparable, that captain *Perry* adviſed, and effected the cutting of, an entire new channel of about a mile in length, 150 feet wide at top, and 70 at bottom, ſince called the new harbour (from the ſea, near 2 miles weſt of the old harbour) into the channel of the Winchelſea river, and through that to the *Rother* and old harbour at Rye; this new canal (finiſhed 14th July 1762) had about its middle part, a ſtone ſluice of two openings, one for the paſſage of veſſels, and the tide near high-water, 40 feet wide, ſhut by double gates pointing to Landward, and another of 30 feet wide, cloſed by 5 draw-gates, to be occaſionally opened for ſcowering the mouth of the new channel or harbour, at which there were two ſtone piers erected at 120 feet apart. The upland and tide waters continued to have their courſe to ſea by the old channel or harbour, and Mr. *Smeaton* who was conſulted in 1763, confidently foretold, that unleſs the old channel was cloſed up near Rye, below the entrance to the new one, ſo as to turn the upland waters through the new harbour, it would be in time quite filted up, as happened ſo completely previous to 1797, that an act then paſſed repealing all the former acts relating to this new harbour, and the tonnage which coaſting veſſels had paid ſince it was eſtabliſhed, on paſſing or entering the ſame, was transferred to Ramſgate harbour, near *Stour* river, into which ſuch ſhips are able to run for ſhelter, in caſe of a ſtorm coming on. The new Rye-harbour was in conſequence blocked up, by a bank below the Winchelſea river, over which the new road between Winchelſea and Rye now paſſes: ſoon after this, the *Rev. Daniel Pape* revived the ideas of Meſſrs. *Perry* and *Smeaton*, with regard to the entrance of the old harbour, and by the aſſiſtance of Mr. *Southerden*, cut a new channel, or ſea vent, for the river, about $\frac{1}{4}$ of a mile weſt of the old harbour's mouth, and being about $\frac{1}{4}$ of a mile in length, before it interſected the old harbour: at this place Mr. *Pape* conſtructed a dam of ſtraw, faggots, and gravel, which effectually blocked up the old harbour's entrance, and forced the tide to enter and return, and the river waters to vent themſelves through his new cut (as Mr. *Smeaton* had in vain before recommended to be done with Mr. *Perry*'s new cut.) After which, Mr. *Sutherland* conſtructed a pier-head on the eaſt ſide, and two jetties on the weſt ſide of the preſent entrance to the harbour, which is now ſaid (ſee *Tranſactions of the Society of Arts*, vol. xxii. p. 249.) to be capable of admitting ſhips of 250 and 300 tons burthen at ſpring tides, which here riſe 23 feet, and the neap tides 14 feet. In December 1799, it was propoſed to improve the navigation of this river between Rye and Robertſbridge, to extend the navigation of the Winchelſea branch to Siddleſcombe, and to make a new navigable branch from Blackwall to Smallhithe near Tenterden. In April 1802, this laſt branch was propoſed to be joined by the intended *Medway and Rother* canal.

*Sandbach Canal.* In the year 1793, a canal was propoſed to be made from the *Severn* river below Shrewſbury to the *Trent and Merſey* canal at Sandbach, with a cut to Betley, and another to join the *Cheſter* canal near Nantwich. The *Ternbridge and Winsford*, and the *Newport and Stone* canals, have at different times been propoſed through parts of the ſame tract of country.

SANKEY CANAL. Acts 28 of Geo. II. and 1 of Geo. III. —The general direction of this canal is nearly N.W. by ſo very bending a courſe, that it exceeds a ſemicircle; its length is 12½ miles in the county of Lancaſter; it is not very greatly elevated in any part: its objects are the export of coals and ſlates, and the ſupply and trade of St. Hellens and Newton, and the copper, glaſs, and other works near them; near Sankey bridge it connects with, and is croſſed by the ſide-cut made in 1804 for avoiding the ſhallows in the *Merſey* between Warrington and Runcorn. Warrington is the 45th Britiſh town, with a population of 10,567 perſons; Newton and St. Hellens are alſo conſiderable towns near, or on this canal; which commences in the *Merſey and Irwell* navigation at Fiddlers-ferry, and terminates near Sutton-heath collieries. Near the mouth of Sankey brook it has a ſhort cut of about ⅛ of a mile, forming another communication with the *Merſey* river; there is a branch of about ⅜ of a mile to Penny bridge, and another of ¼ of a mile to Gerrard's bridge. From the *Merſey* to Sutton heath is a riſe of 78 feet, by 8 ſix-feet locks, and 2 double locks of 15 feet riſe each. The higheſt ſpring tides riſe within about a foot of the level of the water at the firſt lock. Veſſels deeply laden were generally unable to paſs into or out of the *Merſey* for two or three days of neap tides before the *Merſey* cut above mentioned was made. This canal is 48 feet wide and $5\frac{7}{12}$ feet deep in water; it has 18 bridges, all of which are wooden ſwing-bridges, even for the great turnpike road between Mancheſter and Liverpool. Between St. Hellens and Sutton-heath there is a ſhort tunnel; the canal is fed by a feeder from Sankey brook, and there are proviſions for enabling the farmers near this canal to irrigate therefrom, between the 10th of October and 1ſt of May annually. Mr. *John Eyes* was the engineer, and has the honour of completing this, *the firſt Engliſh canal*, that was attempted; it was opened between the *Merſey* and Gerrard's bridge in the year 1760. The ſum of money to be raiſed for the purpoſes of this canal is not limited in the acts, as is done in all modern canal acts. The proprietors are authoriſed to take 12d. per ton on all goods which are navigated on any part of their canal, except limeſtone, road-materials and manures, which are toll free: 63 cubical feet of coal, cannel, charcoal, coke, or cinders, are to be rated as a ton, and a buſhel of coals is to be heaped meaſure in a veſſel 19½ inches diameter outſide, and capable of containing one buſhel and one quart of water Wincheſter meaſure. In June 1797, a loaded barge was rowed 20 miles on this canal by a machine worked by a ſteam-engine on board of the barge, as before mentioned.

*Selby and Leeds.* In 1769, Mr. *James Brindley* ſurveyed the line of a canal from the *Ouſe* river at Selby to the *Leeds and Liverpool* canal (near to the termination of the *Ayre and Calder* navigation) at Leeds: it was propoſed to paſs Thorp dam, near to Thorp hall, Hambleton, Hillham, Burton-Salmon, (where a tunnel was intended,) near Fairburn, Newton, the Fire engines, and croſs the Ayre river, by Thwait mill, Hunſlet, and ſo on to Leeds, a courſe of 23 miles in length: the oppoſition of the *Ayre and Calder* company, who were in the reign of William III. indulged with very high rates of tonnage, and ſome other perſons, proved fatal to this ſcheme when it came before parliament.

SEVERN RIVER. Acts 19 Hen. VII., 23 Hen. VIII. and 12 and 43 of Geo. III.—The general direction of this noble river is nearly north, by a crooked and bending courſe of about 174 miles, ſkirting the counties of Somerſet, Glouceſter, Glamorgan, Monmouth, and Hereford, and through the counties of Worceſter, Salop, and Montgommery: commencing in the tide-way in the *Briſtol Channel*, at Flat-Holm light-houſe, and terminating in the *Montgommery* canal at Welſhpool. Its northern end is conſiderably elevated: the trade of various kinds is very immenſe on this important river, and the many navigations which connect therewith. At the lower layer it is joined by the *Glamorganſhire* canal and *Cardiff and Merthyr-Tydvill* rail-way; at New Amſterdam by the *Sirhowy* rail-way; at Naſh by the *Uſke* river; (not far from its junction with *Monmouthſhire* canal, and a branch of *Sirhowy* rail-way); at King's Road by the Bath *Avon* river; at Beachley by the *Wye* river; at Berkley-Pill, Hotch-Crib, and at Glouceſter by the *Glouceſter and Berkley* canal; at Framiload by the *Stroudwater* river and canal; at Glouceſter, on each ſide of Alney Iſle, and at Laſſington by the *Hereford and Glouceſter*; at Fletcher's leap with *Coombe-hill* canal; at Tewkſbury by the Stratford *Avon*; at Diglis by the *Worceſter and Birmingham*; at Hawford by the *Droitwich* canal: at Stourport by the *Stour* river and *Staffordſhire and Worceſterſhire*, and the *Leominſter* canals; at Coal-port and at Loads-croft near Coalbrooke dale, by the *Shropſhire* canal; and at Shrewſbury by the *Shrewſbury* and *Elleſmere* canals. Briſtol is the 7th Britiſh town, with a population of 68,645 perſons; Shrewſbury the 36th, with 14,739 perſons; Worceſter the 40th, with 11,352 perſons; and Glouceſter the 72d, with 7,579 perſons; Cardiff, Newport, Chepſtow, Thornbury, Berkley, Newnham, Tewkſbury, Upton, Bewdley, Kidderminſter, Bridge-North, Much-Wenlock and Welſhpool, are alſo conſiderable towns near to, or upon this river. The falls which this river has in particular parts have been mentioned in a preceding part of this article, as alſo a valuable experiment of 11 years continuance on the floods, droughts, and froſts which affected its navigation; which is unaſſiſted by any locks, ſide-cuts, weirs, or other erections, except the towing-paths, which Mr. *William Reynolds* begun between Coal port and Coalbrook-dale, in conſequence of an act, 12 of Geo. III., ſince renewed, for making a towing-path between Coalbrook-dale and Bewdley bridge, and levying certain tolls on goods navigated on that part of the river for defraying the expences of ſuch path, which has been ſince completed; and in 43 of Geo. III. a ſimilar act for making a towing-path from Bewdley bridge to the *Worceſter and Birmingham* canal at Diglis below Worceſter, which is, we believe, alſo completed. The trade on the middle parts of this river is carried on by two ſorts of veſſels, viz. barges 40 to 60 feet long with a ſingle maſt and ſquare ſail, carrying from 20 to 40 tons, and trows with a main and top-maſt about 80 feet high, and ſquare ſails; theſe are 160 feet long and 16 to 20 feet in width, and carry 40 to 80 tons. Some years ago, Mr. *John Wilkinſon* introduced ſome barges made of caſt iron plates for navigating this river. In the 16 Geo. III. an act was obtained for erecting a caſt-iron bridge of one arch (the firſt ever erected; ſee our article BRIDGE) over this river at Broſely or Madeley wood near Coalbrook-dale. The high floods, in 1795, carried away a narrow and inconvenient ſtone bridge that was at Buildwas, about 2 miles above Madeley wood, and in 1796, a new caſt-iron bridge was erected in its ſtead, as before deſcribed: by an act of the 17 Geo. III. a new ſtone bridge was erected over this river at Glouceſter, by which the navigation there was much improved. At Shrewſbury the very long and curving loop of the river is tunnelled through by a ſmall arch for conveying water to ſeveral mills at its junction again with the river. In the year 1765, the *Ternbridge and Windsford* canal was propoſed to join this river at Ternbridge; in 1786 the *Stourbridge and Worceſter* was propoſed to join at Diglis; in 1793, the *Sandbach*, and another canal in oppoſition to the *Elleſmere* (called, in ſome maps, the Eaſtern Grand Trunk,) were propoſed to join this river below Shrewſbury. In 1795, the *Welſhpool and Leominſter* was intended to join at Welſhpool; in 1797, the *Briſtol and Glouceſter* was propoſed to join, both at Glouceſter and at Worceſter, to this river; and, in 1801, the *Severn and Wye* rail-way was propoſed to join this river at Lidney.

*Severn and Wye Rail-way*. In the year 1801, a line of rail-way was projected from the *Severn* river at Lidney, acroſs the foreſt of Dean, connecting with the collieries thereon, and extending to the *Wye* river at Engliſh Bichnor, we believe. At a meeting, on the 14th of June, 1802, the ſouthern part of this deſign was relinquiſhed, and the *Dean-Foreſt* rail-way was propoſed in lieu of the other part.

SHANNON RIVER, (*Ireland*). The general direction of this famous river is nearly N.E. by a crooked courſe of more than 100 miles, between the counties of Kerry, Limerick, Clare, Tipperary, Galway, King's county, Meath, Longford, Elphin, and Leitrim in Ireland. It commences in the Atlantic Ocean, at Loop-head, and terminates at Carrick on the Shannon, which is 65 miles above Banagher. It is joined by the *Grand Canal* at Tormanbury, and it alſo is joined by the *Limerick* canal. Limerick, Kilalow, Clonfort, Leitrim, Carr, Longford, Roſcommon, Athlone, Portumny, Nenagh, Aſkeaton, Clare-Abbey, &c. are conſiderable towns on or near to this river. About the year 1750, the improvement of the navigation on this river was attempted, by the erection of ſluices with gates on its ſtream, for damming up and making flaſhes for the boats to paſs through with. The Iriſh parliament, at different periods, between 1753 and 1771, granted ſeveral ſums of the public money, amounting to 39,160l. for the improvement of this navigation. It was not until about March 1804, that the upper part of the navigation on this river was completed.

SHORNCLIFF AND RYE CANAL. Defence act 43 Geo. III.—The general direction of this ſingular canal is nearly S.W. by a bending courſe of about 18 miles, through Romney marſh in the counties of Kent and Suſſex. It is ſo nearly level with the ſea as to require no locks but the tide-locks at its extremities. Its objects, beſides aiding the defence of this part of our coaſt, is the import of coals and ſea-beach for road-making; the export of farming products, and improving the drainage of the marſh: Hythe, Rye, Appledore, and Folkſtone are conſiderable towns near this line; which commences in the tide-way of the Engliſh channel at Shorncliff battery near Hythe, and terminates in the tide-way of the *Rother* river oppoſite Pleydon Heights near Rye. This canal is of width and depth ſufficient for veſſels of 200 tons to navigate; it has a military road by its ſide, and is flanked throughout with batteries of great ſtrength. This canal was projected by the royal military engineers, in the autumn of 1804; and in June laſt (1805) 3000 men were ſaid to be employed thereon, and before now it is, we believe, completed.

SHREWSBURY CANAL. Act 33 Geo. III.—The general direction of this canal is nearly E. by a crooked courſe of $17\frac{1}{2}$ miles in length, in the county of Salop: its eaſtern end is greatly elevated, and at no great diſtance from the grand-ridge on its weſtern ſide; its objects are the export of coals from its eaſtern end, for the ſupply of Shrewſbury, and ſupplying the ſame with farming products, and the country with lime and manures; at Wombridge it is joined by the *Ketley* canal. Shrewſbury is the 36th Britiſh town, with 14,739 perſons. This canal commences in Caſtle Foregate baſon, at the town of Shrewſbury, (near to the *Elleſmere* canal, with which it may be joined by mutual conſent,) and terminates in the *Shropſhire* canal above Wrockandire-wood plane near Oaken-gates. From Shrewſbury to Langdon, near 12 miles, is level; thence to near Wombridge, $4\frac{1}{4}$ miles, is a riſe of 79 feet, by locks; thence is an inclined plane of 75 feet riſe, and near $\frac{1}{8}$ of a mile in length, to the *Ketley* canal; thence (along the part which was purchaſed by this company of Mr. *William Reynolds* for 840l. being half of what it coſt) to the *Shropſhire* canal, $1\frac{1}{8}$ mile, is level. The locks on this canal are contrived in two diviſions by doors, which draw up, out of a receſs formed for them below the locks, ſo that a long narrow canal boat of the uſual conſtruction, or two or four ſmaller and narrow flat-bottomed boats adapted to the inclined-plane, can paſs the ſame without unneceſſary waſte of water. Near Atcham is a tunnel of 970 yards in length, and 10 feet wide, which has a towing-path 3 feet wide through it, conſtructed of wood, and ſupported on bearers from the wall, ſo as not to diminiſh the water-way. At Long is a long embankment and an aqueduct bridge, or rather trough of caſt iron, over the Tern river, 62 yards long, and 16 feet above the level meadows, of which we have already given a deſcription in this article; at Roddington are another embankment and a common aqueduct bridge, 21 feet above the ſurface of the Roden river, over which the canal paſſes, and at Pimley there are another embankment and aqueduct of leſs height and width than the former ones. At Wombridge there is a double *inclined-plane* of 223 yards in length, and 75 feet perpendicular riſe, up one of which, empty or partly laden boats are drawn by the aid of a ſteam-engine, or by the deſcent of a loaded boat at the ſame time on the other, as we have before deſcribed. Mr. *Thomas Telford* and Mr. *William Reynolds* were the engineers employed or conſulted on the conſtruction of the works on this canal. In March 1796, the Long aqueduct was finiſhed; and in February 1797, the whole line was completed and opened. This company was authoriſed to raiſe 70,000l. the amount of each ſhare being 100l. The rate of tonnage is 2d. per ton per mile on all goods, and 1d. per ton for paſſing the inclined-plane; manures, except lime, being exempt on the pounds, but not to paſs the locks when the water is $\frac{1}{2}$ an inch under the lock-weirs. The profits of this concern are not to exceed 8 per cent. on the capital, after which the toll on boats for paſſing the plane is to be firſt lowered or taken off. The act in providing for the purchaſe of $1\frac{1}{8}$ mile of Mr. *Reynolds*'s Ketley canal as above, requires him to pay 2d. per ton per mile afterwards for navigating the ſame, as above. Leſs than 8 tons in a boat, except in returning, is to be paid for as ſuch.

SHROPSHIRE CANAL. Act 28 Geo. III.—The general direction of this canal, or rather ſyſtem of water-levels and inclined-planes, is nearly north, about $7\frac{3}{4}$ miles, in the county of Salop: its northern end is greatly elevated, and at no great diſtance from the grand-ridge on its weſtern ſide; its objects are the export of coals and iron, and the carrying up of lime-ſtone. It communicates near Oaken-Gates with the *Shrewſbury* canal; it has no large town near it. It commences in the *Severn* river at Coal-Port, (a new town eſtabliſhed by the late excellent Mr. *William Reynolds*, whoſe rapidly increaſing manufactories in the year 1800 employed 400 perſons,) and terminates in the *Donnington-Wood* canal at Donnington-Wood. It has a branch from Southall Bank, which proceeds to Brierly Hill near Coalbrook-dale ($2\frac{3}{4}$ miles), and thence is continued by an inclined plane and railway below, to the *Severn* at Loads-Croft, near the Broſley iron bridge. There is alſo a ſhort rail-way branch to Horſe-Hay iron works. At the *Severn* river at Coal Port (formerly called Sheep-waſh Meadow) there is a flood-lock, which riſes ſufficient to clear the higheſt floods in the river, parallel to which the canal proceeds on a level, $\frac{3}{4}$ of a mile, to near Hay, where is an inclined plane of 350 yards long and 207 feet perpendicular riſe ; thence to near Windmill Farm, $1\frac{1}{4}$ mile, is level canal, where is another inclined plane of 600 yards in length, and 126 feet perpendicular riſe ; thence to the Brierly branch at Southall-Bank, $2\frac{1}{4}$ miles, is level canal ; thence to the *Shrewſbury* canal at Oaken-Gates, 3 miles, is level ; thence to near Wrockardine-Wood, $1\frac{1}{4}$ mile, is alſo level : at this place is a third inclined plane, of 320 yards in length and 120 feet perpendicular fall : thence to the *Donnington-Wood* canal, 100 yards, is level. The boats are ſhallow, and carry 5 tons. There are no locks on this canal, which is ſupplied with water by two ſmall reſervoirs which lie above the canal, and two others below its level, the water therefrom being pumped up by the ſteam engines belonging to the inclined planes ; the waters which are lifted from the mines contribute alſo materially to the ſupply of the different lengths of canal. The three great inclined planes at Hay, Windmill, and Wrockardine, have each a ſhort inclined plane deſcending from their tops into the upper canals, up which the boats, on a proper wheeled carriage, are dragged by the ſteam-engines, working the wheels, drums, and ropes, and are, by the aſcent of another boat, or the operation of a brake-wheel, let eaſily down the long plane, as has been particularly deſcribed already in this article. At Brierly-Hill the crates or iron baſkets of lime-ſtone were drawn up, and the coals in boxes were let down, through perpendicular ſhafts, 120 feet deep, by ropes winding on a drum above ; but ſeveral years ago this plan was laid aſide, and an inclined plane, ſimilar to the three others above, except that it has no ſteam-engine, has been adopted, as before mentioned. Six boats have been paſſed down, and as many taken up, the Windmill plane of 600 yards long, in the courſe of a ſingle hour ; the ſteam-engine and 3 men only being employed. It is ſaid that only 3d. is charged for letting down a loaded boat, and empty ones are returned gratis. Mr. *William Reynolds* and Mr. *Henry Williams* were the engineers ; and the works were completed, and the canal opened in the year 1792 ; it is ſaid to have coſt only 47,500l. The rate of tonnage is 2d. per ton per mile on all kinds of goods. In the year 1797, the tolls produced a net profit of 6 per cent. on the capital.

SIRHOWY RAIL-WAY. Act 42 Geo. III. (for *Monmouthſhire canal*).—The general direction of this rail-way or tram-road is nearly N. W., for about 28 miles, in the counties of Monmouth, and of Brecknock in South Wales : its northern end is much elevated : its object is the export of coals and iron from the rich mineral country through which it paſſes : at Court-y-billa farm, and at Riſca, it is joined by rail-way branches of the *Monmouthſhire* canal. Newport is a conſiderable town near its ſouthern extremity : it commences at the *Uſke* river, near Pill-Gwenlly (oppoſite the commencement of the *Monmouthſhire* canal), and terminates at Trevil lime-ſtone quarries, in the pariſh of Llanguinider ; and it has a branch to Rumney union iron works ; the line paſſing through Sirhowy and Tredegar iron works, and through Tredegar park ; it was ſaid alſo, that a branch of the rail-way was to be conducted from near Tredegar park to the meadows near the *Severn* river, where a new ſea-port town, to be called New Amſterdam, was laid out and begun. This company were authoriſed to raiſe 45,000l., the amount of their ſhares being 100l., and they have engaged to pay 110l. annually to the *Monmouthſhire* canal company, on condition of their conſtructing the firſt 9 miles of this tram-road neareſt to *Uſke ;* ſir *Charles Morgan* is to make 1 mile in length of the ſame through his park at Tredegar, and receive the tolls thereon ; and Meſſrs. Samuel Homfray, Richard Fothergil, Matthew Monkhouſe, William Thompſon, William Forman, and other iron-maſters, are alſo to conſtruct particular parts of this concern. It was provided, that if theſe ſeveral parties failed to execute their ſeveral parts of the line, previous to Michaelmas day 1803, that the act, as far as relates hereto, ſhould be void. A new turnpike road is made by the ſide of this rail-way for 21 miles : the aſcent of the rail-way is ſo eaſy and regular that one horſe can draw 10 tons down the line, and return with the empty trams. A new town was laid out and begun at Tredegar new iron works, near Sirhowee.

SLEAFORD NAVIGATION. Act 32 Geo. III.—The general direction of this navigation is nearly weſt, for about 12 miles, in the county of Lincoln ; it is but little elevated above the ſea, the greater part of it being embanked on both ſides through level fens : its objects are the ſupply of Sleaford and the ſurrounding country with coals, deals, &c., and the export of farming produce. Tatterſhall and Sleaford are conſiderable towns near this navigation. It commences in the old *Witham* river at Chapel-Hill (not far from the commencement of *Horncaſtle* canal), and terminates at the caſtle-cauſeway near Sleaford. The locks are 60 feet long, and 15 feet wide in the clear ; the width of the canal is 30 feet at top, 18 at bottom, and four feet deep, except the ſummit pound from Haverholm mill to Sleaford, which is to be 5 feet deep, to make a reſerve of water, which is to be ſupplied from the fens above the navigation in New Sleaford. This company was authoriſed to raiſe 23,000 l., the amount of ſhares 100l. each. The tolls are various for different parts of the line. See *Phillips*'s 4to. *Hiſtory*, *Appendix*, p 26. Lime, manures, and road-materials pay only half the rates of other articles. The profits of this concern are limited to 8 per cent. and after 1000l. is accumulated as a fund for contingencies, the tolls are to be lowered. This company are to join with the *Horncaſtle* canal company, in the expence of improving the old *Witham* river between Lincoln high bridge and the *Foſs-dyke* navigation at Brayford-Meer ; in conſequence of which only half the uſual tolls on the old *Witham* are to be taken, on goods paſſing to or from theſe navigations.

SOHAM LODE. The direction of this navigable cut or lode is nearly S. E., for about 4 miles, and is embanked through the level fens in Cambridgeſhire : it commences in the great *Ouſe* river, near Barway chapel, and after paſſing through Soham-Meer, terminates at the town of Soham : its objects are the ſupply of coals, &c. to Soham, and the export of farming products.

SOMERSETSHIRE COAL CANAL. Acts 34, 36, and 42 Geo. III.—The general direction of this canal is nearly S. W., for about 10 miles, beſides a principal branch of $7\frac{1}{2}$ miles nearly parallel thereto, in the county of Somerſet : its weſtern ends are conſiderably elevated : its object is the export of coals from the mines north of Mendip hills. Bath is the 12th Britiſh town, with a population of 32,200 perſons, and Bradford the 78th., with 7,302 perſons, which are the only large towns near this canal ; which commences in the *Kennet and Avon* canal, at Monkton Coombe, and the main or Dunkerton line of canal terminates at Paulton ; but a rail-way continues it forwards to Tyning ; the Radſtock line or branch of canal proceeds from the laſt at Mitford mill, and terminates at Radſtock town ; but a rail-way continues it forwards to Welton colliery ; there are alſo rail-way branches from this line to Radſtock colliery, and to Smallcombe and Clandon collieries : from the main or Dunkerton line, there are rail-way branches to Mearns, Ameſbury's, Britton's, Saliſbury's, and Radford collieries. From the *Kennet and Avon* canal to Mitford mill is level, thence the main or Dunkerton line riſes 138 feet by 22 locks. The Radſtock line riſes about the ſame height from Mitford mill. The boats uſed are 72 feet long, and 7 feet wide. About July 1796, Mr. *Robert Weldon* began the erection of one of his diving or caiſſon locks at Coombe-Hay, for paſſing the boats through a perpendicular ſhaft, either in aſcending or deſcending. In November 1797, this apparatus was in ſufficient forwardneſs for the caiſſon to be ſunk and raiſed again in the ſhaft; and, in May 1798, a trial was made of this contrivance, ſo ſucceſsful, that the inventor then offered to undertake to paſs 1500 tons of goods in 12 hours through this 45 feet riſe or fall, without the loſs of any conſiderable quantity of water, and with the aſſiſtance of only one man, beſides the bargemen, to work the machinery. Theſe fair proſpects were, however, blaſted, by the bulging of the walls of the ſhaft, as we have already mentioned, in deſcribing this contrivance; and inclined planes were conſtructed at this place for letting down boxes full of coals, the deſcent of which, by means of ropes and wheels, drew up the boxes, either empty, or in part loaded with other goods: the delay and expence of this method being highly complained of, about September 1802, a new ſubſcription was ſet on foot, and encouraged by the *Kennet and Avon* and *Wilts and Berks* companies, for ſubſtituting locks, 22 of which were completed, and opened on the 5th of April laſt (1805). Mr. *John Rennie*, Mr. *William Bennet*, Mr. *Charles Wedge*, and Mr. *William Smith* were the engineers conſulted or employed upon this canal, which, in January 1801, was completed from Dunkerton to ſeveral of the coal mines, and which, (after 4 miles of land carriage,) had the effect of lowering coals at Bath from 14d. or 15d. per cwt. to 9d. or 10d. This company was authoriſed to raiſe 185,000l., the amount of ſhares 100l. each. Before undertaking any of the rail-way branches to the collieries, this company might require ſecurity from the owners of ſuch collieries, that the tolls thereon ſhould produce, or be made up, to a certain rate of intereſt on the coſt of ſuch branches. The profits of this concern are not to exceed 10 per cent.; but after 1000l. is accumulated and placed in goverment ſecurities, as a fund for contingencies, the tolls on coals are to be lowered. Huſbandry and pleaſure boats 12 feet long and 5 feet wide may be uſed toll free on the pounds, or where the water flows waſte over the lock-weirs. A tunnel, $\frac{3}{4}$ of a mile long, was at firſt propoſed near Coombe-Hay, but by a ſubſequent alteration of the line this was avoided. The rates of tonnage in the firſt act may be ſeen in *Phillips*'s 4to. *Hiſtory*, *App.* p. 163 and 164, including the tolls on horſes, cattle, ſheep, &c. travelling on the rail ways; by the laſt act ſome of the tolls were increaſed. Dunkerton mill was purchaſed by this company, and ſteam-engines were erected to pump up water for ſupplying the upper pounds. In ſeveral places this canal was cut through *ſtrata* diſpoſed to ſlip, but by the ſmall tunnels or ſoughs which Mr. *William Smith* conſtructed, for draining off the ſprings, the ſame was prevented. On the 3d of May, 1804, a ſudden and great flood happened, which required, it was ſaid, ſome of the banks of this canal to be cut in proper places, to give vent to the water.

SOUTHAMPTON AND SALISBURY CANAL. Acts 35 and 40 of Geo. III.—The general direction of this canal is nearly N.W. for about 17 miles, in two detached lengths, in the counties of Hants and Wilts; it is not greatly elevated; its objects are the trade between Southampton and Saliſbury, the ſupply of theſe towns, and the export of the ſurplus farming products of the intermediate country. This canal commences in the *Itchin* river, at Northam near Southampton, and proceeds along the N.E. ſhore of *Southampton water* to the *Andover* canal at Red-bridge. In the *Andover* canal (about $9\frac{1}{2}$ miles above Red-bridge), near Kimbridge mill, this canal commences again, and proceeds to the *Avon* river at Saliſbury, or New Sarum. Southampton is the 68th Britiſh town, with a population of 7,913 perſons, and Saliſbury is the 70th, with 7,768 perſons: Romſey is alſo a conſiderable town near this line. The eaſtern part of this canal, between Northam and Red-bridge is level, and but little elevated by its tide-locks, above the tide-way in *Itchin* river and *Southampton Water*; from its ſkirting along cloſe to the ſhore of the latter river, it was that that facetious ſatiriſt *Peter Pindar* took occaſion to burleſque "Southampton's wiſe ſons." Upon this part of the canal there is a tunnel of conſiderable length cloſe to, and indeed under part of the north end of Saliſbury town; conſiderable difficulties ſeem to have attended the making of this tunnel, owing to the looſeneſs of the ſoil; and the quick-ſands at the foot of the cliff, by the ſide of *Southampton Water*, have alſo proved a very ſerious obſtacle. An aqueduct is built over Shirley Brook; ſprings within 1000 yards of the canal may be taken for its ſupply, which is alſo to be aided by ſome reſervoirs, which were begun in 1796. This company have been authoriſed to raiſe 96,000l. the amount of each ſhare being 100l. Mr. *John Rennie* is the engineer; the eaſtern part of the canal was begun in 1796, and was ſaid, in 1803, to be nearly done, but it is not yet opened. The weſtern part from the *Andover* canal at Kimbridge was completed to Deane, in October 1798. Stones are to be erected on the banks of this canal, at every $\frac{1}{4}$ of a mile diſtance.

SOUTHAMPTON WATER. Acts 11 Henry VII. and 18 Henry VIII.—This noble eſtuary of the Anton and other rivers has a N.W. direction for about 10 miles in Hampſhire. The tide flows through its whole length, and through a branch thereof more than 5 miles in length to near Botley; *Southampton water* is navigable for large ſhips; it commences in the channel between Hampſhire and the Iſle of Wight at Calſhot Caſtle, and terminates near Red-bridge where it is joined by the Anton river (formerly navigable near 6 miles to Romſey), and the *Andover* canal near one of the terminations of the *Southampton and Saliſbury* canal; near Saliſbury it is joined by the *Itchin* river, (about $\frac{3}{4}$ of a mile from the commencement of the *Southampton and Saliſbury* canal.) In the 43d of Geo. III., an act paſſed for enlarging and improving the quay and harbour of Southampton, by building a pier and other works which commenced in December 1803, and have ſince been proceeding.

STAFFORDSHIRE and WORCESTERSHIRE CANAL. Acts 6, 10, and 30, of Geo. III.—The general direction of this canal (ſometimes called the Wolverhampton canal) is nearly north for $46\frac{1}{2}$ miles in the counties of Worceſter and Stafford; its middle part is very conſiderably elevated, and it croſſes the grand-ridge without a tunnel; its trade in the export of coals, pottery-wares, hard-wares, &c. is immenſe, beſides the general trade between the *Severn*, the *Merſey*, and *Trent*, which for a long time paſſed excluſively through it. Near to Stourton, and to Stewponey, it is joined by the *Stourbridge* canal, and at Alderſley or Autherley by the Old *Birmingham* canal. Wolverhampton is the 33d Britiſh town with 12,565 inhabitants, and Kidderminſter is the 95th with 6,110 perſons: Bewdley, Stourbridge, Penkridge, and Stafford, are alſo conſiderable towns on or near to this canal; which commences in the *Severn* river at Stourport, and terminates in the *Trent and Merſey* canal at Great Haywood. From the *Severn* river at Stourport, to the *Stourbridge* canal at Stewponey, $12\frac{1}{4}$ miles, is a riſe of $127\frac{1}{2}$ feet by 13 locks; thence to Tettenhall, the beginning of the ſummit-pound, 11 miles, is a riſe of $166\frac{1}{2}$ feet by 18 locks; thence to the old *Birmingham* canal, $1\frac{1}{4}$ mile, is level; thence to Street-way, $8\frac{3}{4}$ miles, is level to the N. end of the ſummit-pound; thence to the *Trent and Merſey* canal at Haywood, $13\frac{1}{4}$ miles, is a fall of $100\frac{1}{2}$ feet by 13 locks. This canal is 30 feet wide at top, and 5 feet deep, though the depth of water on the lock-ſills is only 4 feet. The locks are 74 feet long and 7 feet wide; and ſeveral of them are built of a red kind of free-ſtone; the boats in general carry 20 tons. At Stourport are two baſons belonging to this canal connected with the Severn river by flood-locks to keep the water in them always at one certain height. On this canal are three ſhort tunnels; one is near to Stewponey, the other at Whitlington, and the other is an arched-way under part of the town of Kidderminſter; at which place there is an aqueduct-bridge over the Stour river, another at Preſtwood on Wordſley brook, another near Milford on the Sow river, and another at Haywood mill over the Trent river. In Chillington is a large reſervoir, and at Moſeley another, whoſe waters are conveyed to the ſummit-pound by feeders of conſiderable length. This company may make branches to any place within 1000 yards of the line by conſent of the land-owners. Mr. *James Brindley* was the engineer to this canal, which he began in September 1766, aud finiſhed in 1772. The firſt lock which this engineer erected was at Crompton, on this canal. This company were authoriſed to raiſe 100,000l., the amount of each ſhare being 100l. In September laſt (1805), the yearly dividend on theſe was ſtated to be 24l. The rates of tonnage are ſtated (in Mr. *John Cary*'s excellent work with maps, now publiſhing in numbers, on Inland Navigation,) to be $1\frac{1}{2}$d. per ton (2400lb.) per mile on all kinds of articles except lime and lime-ſtone, which pay only $\frac{1}{2}$d. per ton; and paving and road materials, and manures for adjoining lands which are to paſs toll free on the pounds, and through the locks when the water flows over the lock-weirs. By the *Dudley* act (16 Geo. III.), coals brought from that canal and carried on this may be charged 2d. per ton per mile, but commiſſioners may authoriſe lowering this toll. The uſual charge made by bargemen in 1796 for freight (including the company's tonnage) was, for periſhable goods $2\frac{1}{2}$d. per ton per mile, and for heavy unperiſhable goods 2d. In 1802, a tunnel 5 feet in diameter and 135 feet long, compoſed of cylinders of caſt-iron, was laid under the river Penk near this canal for draining a moraſs of 500 acres. In the laſt ſeſſions (45 Geo. III.) application was made by this company for a new act, to raiſe the tolls in order to make new locks, the old ones in ſome places being decayed and nearly worn out, and for making ſome new rail-way branches. The *Stour* river between Stourport and Stourton, by the ſide of this canal, was made navigable ſeveral years ago, but the works thereon were ſoon after deſtroyed by a great flood. In the preſent month (November 1805), a rail-way branch from Latherford in Shareſhill is propoſed, to Mr. Henry Vernon's collieries in Buſhbury.

Stainforth and Keadby Canal. Acts 33 and 38 of Geo. III. The general direction of this canal is nearly W.; for 15 miles in the counties of Lincoln and York, it has its courſe through level fens and is but little elevated above the level of the ſea; its objects are the import of coals and export of agricultural produce, with a better drainage of the country through which it paſſes. Thorne is the only conſiderable town near this line; which commences in the *Trent* river at Keadby, and terminates in the *Don* river at Fiſhlake near Stainforth, having alſo a branch 1 mile in length which joins the *Don* river at Hangman-Hill in Thorne; the whole is on one level, having tide or flood-locks at its extremities to regulate its height notwithſtanding the variable tides and floods in the adjoining rivers. A reſervoir of 5 acres is conſtructed on Thorne Common, and the waſte water from this canal is to be diſcharged into the *Trent*. In 1762, when Mr. *John Smeaton* was conſulted about the drainage of Potterick Car, a navigable canal through theſe fens was in contemplation. This company were authoriſed to raiſe 54,200l., the amount of ſhares being 100l. each.

Stoke River. The direction of this river (ſometimes called the Winſon) is W. for about $8\frac{1}{2}$ miles in the county of Norfolk; it is embanked nearly its whole length through the fens, and is but very little above the ſea; its objects are the import of coals, deals, &c. and the export of agricultural products. Downham is the only conſiderable town near it; it commences in the Great *Ouſe* river between Denvers-ſluice and Salters-Load, and terminates at Stoke-Ferry near the town of Stoke.

Stort River. The general direction of this river is almoſt N.E. by a bending courſe of about 13 miles between the counties of Eſſex and Hertford; its northern extremity is conſiderably elevated; its objects are the import of coals, deals, &c. and the export of farming products. Hoddeſdon and Biſhopſtortford are conſiderable towns near this river; which commences in the *Lea* river near Hoddeſdon, and terminates at Biſhopſtortford. In 1785, this navigation was propoſed to be joined at its northern end by the *Biſhopſtortford and Cambridge*, and in 1789, it was intended to join the *Biſhopſtortford and Wilton* at the ſame place.

Stour River (*Chriſtchurch*.) The direction of this river is nearly N.W. for about 35 miles in the counties of Hants and Dorſet; its northern end is conſiderably elevated; its objects are the import of coals, deals, &c. and the export of farming products; Chriſtchurch, Wimborn-Minſter, Blandford-Forum, and Sturminſter-Newton, are conſiderable towns on this river; which commences in the tide-way in Chriſtchurch-bay at Chriſtchurch-harbour, and terminates at the town of Sturminſter. At Gains-croſs in Shillington-Okeford, it is to be joined by the *Dorſet and Somerſet* canal. In 1762, Mr. *John Smeaton* was conſulted on the intended improvements in Chriſtchurch-harbour; the ſpring-tides in this harbour flow only 5 to 7 feet, and the neap-tides no more than 4 to 6 feet; and 3 hours after high water there is a ſecond or ſmaller tide, which flows in the harbour from 8 to 18 inches, being greateſt at the neap-tides. In the reign of Charles II., a pier of 256 yards in length, was conſtructed of lumps of iron-ſtone out of the looſe ſandy-cliff near it, and Mr. *Smeaton*, in 1764, planned another pier to be built for the better ſecurity of this harbour.

Stour River (*Harwich*.) The general direction of this river is nearly W. by a bending courſe for about 29 miles between the counties of Eſſex and Suſſex; the firſt 10 miles is a wide eſtuary through which the tide flows, the weſtern end is not greatly elevated; its objects are the import of coals, deals, &c. and the export of farming products; Harwich, Manningtree, Neyland, and Sudbury, are conſiderable towns on this river; which commences in the *Stowmarket and Ipſwich* navigation (near its junction with the German Ocean) at Harwich, and terminates at Sudbury.

Stour River (*Sandwich*.) Act 7 Henry VII.—The general direction of this river is nearly W. by a crooked courſe of about 18 miles in the county of Kent; it is but little elevated above the ſea in any part; its objects are the ſupply and trade of Canterbury, and the export of farming products. Canterbury is the 57th Britiſh town with a population of 9,000 perſons, and Sandwich is the 93d with 6,506 perſons, Ramſgate is alſo a conſiderable place near to this river; which commences in the Engliſh Channel or

Downs at Sandwich Haven (1½ mile from Ramſgate-harbour), and terminates at the city of Canterbury; the lower end of this river, for 1½ mile in Pegwell bay, has its courſe through ſhifting ſands which are dry at low water, and covered at high water; it is therefore unſuited for large veſſels to enter, and *Ramſgate harbour* is the only ſecure retreat for ſhips in caſe of a ſtorm on this part of the coaſt. The celebrated piers which form this harbour were begun in 1749; the ſouthern pier extends 800 feet eaſtward into the ſea, it then returns northward, forming the front next the Downs, by a polygon of 5 ſides, each 450 feet in length; theſe are joined at their angles by octagons of ſolid maſonry that are 60 feet acroſs; the breadth of the pier at top including the parapet is 26 feet, and the whole is built of hewn Portland and Purbeck ſtone. The entrance for ſhips is from the north nearly, and is 200 feet wide, having a light-houſe with Argand's reflecting lamps on its weſt head, and this is connected with the ſhore by a ſimilar, though ſhort pier, as on the ſouthern ſide. The area of the famous harbour, thus formed in the open ſea, is 46 acres, and it is deep enough to receive ſhips of 4 or 500 tons burthen. A ſpacious dry-dock for the repair of ſhips connects with this harbour. In a few years after the piers were completed, this harbour was nearly choaked with mud depoſited by the tides. Mr. *John Smeaton*, who was conſulted, erected a croſs-wall at the uppermoſt extremity of the harbour with numerous ſluices therein, by the drawing of which, after the tide has retired and left this reſervoir full of water, the mud has been ſince effectually ſcoured out; this excellent engineer alſo extended the pier 400 feet at the head. Nearly 300 ſhips have been known at once to aſſemble in this harbour for ſhelter on the approach of a ſtorm. An act 5 Geo. III., paſſed for improving this harbour as above, and by 37 Geo. III. the tonnage charged on veſſels paſſing the Engliſh Channel for the ſupport of Rye-harbour, was transferred to this harbour as before mentioned. In the years 1802 and 1804, the *Canterbury and Nicholas-bay* canal was intended to join the *Stour* river at Canterbury; and in 1802, the *Medway and Rother* canal was propoſed to join it near the ſame place.

*Stour River* (*Stourbridge.*) Many years ago the *Stour* river from the *Severn* at Stour-port to the town of Stourbridge, (paſſing the town of Kidderminſter,) about 14 miles, was made navigable by means of ſluices, weirs, and other works; but ſoon after there happened ſo ſudden and violent a flood as to deſtroy all theſe works. The *Stafford and Worceſter*, and the *Stourbridge* canals, have ſince ſupplied more effectually the place of this river navigation.

STOURBRIDGE CANAL. Acts 16 and 22d of Geo. III. The general direction of this canal is nearly E. by a crooked courſe of about 5 miles in the county of Stafford; its eaſtern end is conſiderably elevated, and extends within about 3 miles of the grand-ridge on its eaſtern ſide; its objects are the export of coals, iron-ſtone, &c. and forming part of the communication between the Old *Birmingham* and the *Severn*, &c. Stourbridge and Dudley are conſiderable towns near this line; which commences in the *Staffordſhire and Worceſterſhire* canal near Stourton and Stewponey, and terminates in the *Dudley* canal at Black-Delph; there is a branch of near 1 mile to the town of Stourbridge, and a branch of 2 miles to Penſnett-Chaſe reſervoir, with a ſide-branch thereto of near ¾ of a mile in Brierly pariſh. From the *Stafford and Worceſter* canal to near Stewponey, ⅜ of a mile, is a riſe of 43¼ feet by 4 locks; thence to the Stourbridge branch, 2 miles, is level; thence to the Lays, 1⅛ mile, has a riſe of 148 feet by 16 locks; thence to the *Dudley* canal, 1½ mile, is level; the Penſnett and Brierly branches are level with the laſt or ſummit-pound, and the Stourbridge branch is level. The width of this canal is 28 feet, and the depth of water 5 feet. The Penſnett-Chaſe or Fen reſervoir is 12 acres in extent, for ſupplying the head-level of this canal. This company were at firſt authoriſed to raiſe 30,000l. in 100l. ſhares; the laſt act authoriſed calling upon the ſubſcribers for 7,500l. more, by which their ſhares are now increaſed to 125l each. The rates of tonnage will be found in Mr. *John Cary*'s *Inland Navigation*, pages 50 and 51. Goods may be navigated on the ſummit-level toll free; and road-materials and manures for adjoining lands, may alſo be carried on any of the pounds toll free. Leſs than 15 tons are not to paſs any lock without conſent. Side-branches may be made to the adjacent collieries. The *Worceſter and Birmingham* company were bound (act 31 Geo. III.) to make up the profits of this concern to 9 per cent per annum, in caſe of their canal leſſening the trade thereon; but on the extenſion of the *Dudley* canal to join the *Worceſter and Birmingham*, the laſt mentioned company were exonerated therefrom, and the *Dudley* engaged (33 Geo. III.) to make up the annual dividend on the ſhares in this concern to 12l. each; but not to exceed 3l., and this when their own canal yielded a dividend of 5l. per ſhare. The part of this canal below Stourbridge ſupplies the place of the river *Stour* navigation, which was deſtroyed by floods as above mentioned. In 1786, the *Stourbridge and Worceſter* was propoſed to join this canal at Stourbridge; as was alſo a branch ſince propoſed from the *Worceſter and Birmingham*.

*Stourbridge and Worceſter.* In 1786, a canal was propoſed, and ſupported by the late lord *Dudley and Ward*, from the *Severn* river at Diglis below Worceſter city to the *Stourbridge* canal at that place, paſſing Bromſgrove; its propoſed length was 26 miles with 772 feet of lockage, by 128 locks; ſome tunnels and other large works were neceſſary; a bill for this canal paſſed the commons, but was rejected by the houſe of lords.

STOVER CANAL. Act 32 Geo. III.—The general direction of this canal is nearly N.W. for 6½ miles in the county of Devon; it is but little elevated; its objects are the import of coals, ſhelly ſea-ſand and lime, as manures, and the export of potters' clay (uſed in Staffordſhire, Lancaſhire, &c.) and a peculiar kind of imperfect coal found in ſmall quantities at Bovey-Tracey; Newton-Buſhel and Chudleigh are conſiderable towns near this canal, which commences in the tide-way in the *Teign* river at Newton Abbots, and terminates at Bovey-Tracey, with a branch of 5½ miles to the town of Chudleigh. From Newton-Abbots to Newton-Buſhel, 1 mile, is a riſe of 20 feet; thence to Bovey, 5½ miles, is 30 feet riſe; the Chudleigh branch is level. *James Templer*, eſq. is the ſole proprietor of this canal, and Mr. *Gray* was his engineer. At Teigngrace, and the adjoining pariſhes, the ſurplus water of this canal has been applied to the irrigating of the lands below it, a capital improvement, which we are very anxious to ſee more generally adopted.

*Stowmarket and Bury Rail-way.* In December, 1802, it was in contemplation to make a rail-way from the *Stowmarket and Ipſwich* navigation at Stowmarket, to the *Lark* river at Bury St. Edmunds, for the purpoſe of ſupplying the latter place, and the intermediate country with coals; (the *Lark* navigation being often interrupted by droughts in the autumn;) and for the readier export of farming products.

STOWMARKET AND IPSWICH NAVIGATION. Acts 33 and 45 Geo. III.—The general direction of this navigation (which follows the courſe of the Orwell river) is nearly N.W. for about 26 miles, in the county of Suffolk, the firſt 13 miles, to near Ipſwich, being a wide channel or eſtuary in the tide-way, the remainder is not greatly elevated; its objects are the import of coals, deals, &c. and the export of ſarming products; it is joined by the *Stour* river near Harwich. Ipſwich is the 41ſt Britiſh town, with a population of 11,277 perſons. Harwich, Needham, and Stowmarket are alſo conſiderable towns near this navigation; which commences in the German ocean at Landguard fort, and terminates at the town of Stowmarket. This company were, by an act prior to the above, authoriſed to raiſe 14,300l. by the firſt act above 15,000l. more might be raiſed; the laſt act was for improving the port of Ipſwich by deepening the ſame, ſo that ſhips might unload at the wharfs, &c. In December, 1802, it was propoſed that the *Stowmarket and Bury* rail-way ſhould join this navigation at Stowmarket.

STRATFORD CANAL. Acts 33, 35, and 39 Geo. III.—The general direction of this canal is nearly N. for 23½ miles, in the counties of Warwick and Worceſter; it is very conſiderably elevated, and croſſes the grand-ridge: its objects are the export of coals, lime, and paving-ſtones, and as a link in the great chain of canal communication; at Kingſwood in Rowington a branch of this canal connects with the Warwick and Birmingham: Stratford-upon-Avon and Henley are conſiderable towns on or near this canal, which commences in or near the *Avon* river at Stratford, and terminates in the *Worceſter and Birmingham* canal at King's Norton, about 6 miles from Birmingham. From near Hockley there is a branch 2½ miles long to Tanworth quarries; from near Lapworth there is another branch of 1¾ miles to the *Warwick and Birmingham* canal; and from near Wilmcote is a branch of 4 miles to Temple-Grafton lime-works, with a branch of about 1 mile from this cut to Aſton-Cantelow. From Stratford to near Copnas-hill, 1½ mile, is level; thence to Wilmcote, 1 mile, has a riſe of 86 feet; thence to Preſton-mill, 6 miles, is level; thence to Preſton-green, 1¾ mile, is a riſe of 76 feet; thence to Lapworth-hall, 1 mile, is level; thence to Hockley Heath, 2¼ miles, is a riſe of 147 feet; and thence to the *Worceſter and Birmingham* canal, 10 miles, is level; the Tanworth branch is level, and connects with the ſummit-pound: the Temple-Grafton cut is level for the firſt 2½ miles, and in the next 1½ mile the riſe is 20 feet. Near Milepole hill is a tunnel of 320 yards in length; there are ſeveral ſmall aqueduct bridges; and ſome deep-cutting near Waring's Green. In May 1796 the ſummit-level of this canal from the *Worceſter and Birmingham* canal to Hockley-heath was completed and opened. This company was authoriſed to raiſe 225,000l. the amount of ſhares 100l. The rates of tonnage and exemptions are very long; ſee *Phillips*'s 4to. *Hiſtory*, *Appendix*, p. 111 and 112. At the junction with the *Worceſter and Birmingham* canal ſtop-gates are to be erected, to be ſhut and locked by either company, when the ſupplies of the other canal fail in dry ſeaſons; with the *Dudley* and *Worceſter and Birmingham* canals there are a number of regulations as to tonnage, in the ſecond act above (35 Geo. III.). About the year 1792 the *Stratford and Croperdy* canal was propoſed to join this at Stratford.

*Stratford and Croperdy.* About the year 1792 a canal was propoſed to connect with the *Avon* river and *Stratford* canal at Stratford, and proceed to the *Oxford* canal at Croperdy, by a courſe of about 31 miles in length; this being the ſouthern part of the propoſed line between Dudley and Croperdy; the northern part thereof being ſince occupied by the *Stratford* and the *Dudley* canals.

STROUDWATER CANAL. Acts 34 Geo. II. 15 Geo. III. 23 (for *Thames and Severn*,) and 33 and 37 Geo. III. (for *Glouceſter and Berkley*).—The general direction of this canal is about E. for 8 miles, (following nearly the courſe of *Stroudwater* river,) in the county of Glouceſter; it is not greatly elevated; its objects are the import of coals, and forming part of the firſt direct communication between the *Severn* and *Thames and Iſis* rivers; at Wheatenhurſt the *Glouceſter and Berkley* canal croſſes and connects herewith. Stroud is the 114th Britiſh town, with a population of 5,422 perſons. This canal commences in the *Severn* river at Framiload, and terminates in the *Thames and Severn* canal at Wallbridge near Stroud; from the *Severn* to the *Thames and Severn*, there being a riſe of 108 feet: this canal is wide enough for the Severn river boats. The engineers were Mr. *Thomas Yeoman* and Mr. *Robert Whitworth*. The firſt of the above acts was for powers to raiſe 20,000l. in 200l. ſhares, intending to execute the works under the powers of an act of 2 Geo. II. for improving the *Stroudwater* river, but ſeveral expenſive law-ſuits put a ſtop to the works, as we have already mentioned, until the ſecond act was obtained: a double lock of 14 feet riſe on this canal had a ſlipping bank of earth 20 feet high by its ſide, and gave immenſe trouble, to prevent the walls thereof being bulged in, this was at laſt accompliſhed by the turning of two dry drains of four feet diameter, between the lock and the bank. In 1802 the dividends on ſhares in this concern were 6l. each, and their price was about 225l. This canal has no horſe towing-path, but ſtiles are erected thereon, and the barges are hauled by men. Where this canal croſſes the *Glouceſter and Berkley*, ſtop-gates are to be erected to prevent this canal from loſing its water; no dues are to be taken for veſſels croſſing either of theſe canals. If, while the *Glouceſter and Berkley* is cutting, the navigation of this canal is interrupted, five guineas per day are to be paid to this company; veſſels paſſing to or from the *Berkley and Glouceſter* canal and this, are to pay the ſame tonnage as to and from the *Severn* at Framiload. This company are authoriſed to take 2s. 3d. per ton for coals which paſs through this canal, and on the *Thames and Severn* canals, but not beyond Brinſcomb bridge thereon, and for ſuch coals as paſs eaſtward of Brinſcomb bridge, 1s. per ton.

*Stroudwater River.* The act of 2 Geo. II. paſſed for making this river navigable between the *Severn* and the town of Stroud, a diſtance of about 8 miles, as above; but the oppoſition of the millers and others prevented its being accompliſhed, until 34 Geo. II. when Mr. *Bridge* undertook to conſtruct the navigation, without waſte of water or prejudice to the mills, by means of cranes to hoiſt the goods in boxes out of the boats in one pound, and place them in others in the adjoining pounds, as we have before deſcribed; but this ſcheme miſcarried, and the projectors were nearly ruined: at length the *Stroudwater* canal was conſtructed by the ſide of this river as above.

SURREY IRON RAIL-WAY, (*Northern part*). Acts 41 and 45 Geo. III.—This, the firſt public rail-way conſtructed near the metropolis, has about a S.E. direction, for 10 miles, in the county of Surrey: its ſouthern end has a conſiderable elevation: its objects are the import of coals and manures, and the export of chalk, flint, fire-ſtone, fullers'-earth, and agricultural products. Croydon is the 108th Britiſh town, with a population of 5703 perſons; Wandſworth is alſo a conſiderable town on this line; which commences near the tide-way in the river *Thames* at Wandſworth, and terminates at the turnpike-houſe S. of Croydon, in the ſouthern part of the *Surrey iron-rail-way*; at the N.W. extremity of Croydon the line of this rail way is but about ⅜ of a mile from the *Croydon* canal; from Mitcham common a branch goes off for about 1½ mile to Mr. *Shipley's* ſkinning mill at Carſhalton; and, to Meſſrs. *Were* and *Burſh*'s oil-mill, about ¼ of a mile, there is another branch at Garrat-lane. This rail-way has nowhere a greater aſcent than about 1 inch in 10 feet: it is double throughout, with numerous croſſing places for the carriage out of one road or track into the other,

other; of theſe we have already given a particular account, as alſo of the contrivances for ſhooting the contents of the rail-way waggons, on ſome occaſions, into barges lying in the entrance baſon at Wandſworth, which is about ¼ of a mile long, with a lock next the *Thames*, and is ſpacious enough to hold 30 barges or more at once, ſeveral of which can lie along the wharf to load or unload at the ſame time. The width of each track is about 5½ feet, the waggons carry about 3⅕ tons each, and ſeveral of them are often linked together to be drawn by one horſe. This rail-way croſſes the Wandle river twice on wooden bridges. On the 9th of January, 1802, the entrance baſon at Wandſworth was completed and opened; in October of the ſame year, the rail-way from the ſide thereof croſſing the turnpike road, and extending to Garrat was completed, and in the courſe of the preſent year it was opened to Croydon. The company were, by the firſt act, authoriſed to raiſe 50,000l. and a further ſum, by the act of the late ſeſſions, the amount of ſhares 100l. Few ſubjects have been more variably ſtated than the coſt per mile of this rail-way. Mr. *John Phillips*, after noticing in his *Hiſtory* the commencement of this work, adds, that iron rail-ways are made at an expence of about 300l. per mile. The original eſtimate was, we believe, 2000l. per mile; at a public meeting at Goſport, in September 1803, it was ſtated by ſome favourers of the extenſion of a canal from Croydon to Portſmouth, that the expenditure on this rail-way had amounted to 6,400l. per mile; but the advocates for extending this rail-way to Portſmouth inſtead of a canal, then contended that the expence did not exceed 4,500l. per mile; while Mr. *James Malcolm*, in his Agricultural Report on Surrey, juſt publiſhed, after ſtating the great pains he had been at to come at the facts, ſays, "inſtead, therefore, of the expence being 2000l. per mile, it appears as if it would be 7000l.!" (this includes all the expenditure of the company). The rates of tonnage are from 2d. to 6d. per ton, per mile, for different goods; and owners of adjoining lands may uſe the rail-way as a drift road. Ten pounds annually are to be paid to the city of London by this company, for connecting with the river Thames.

SURREY IRON RAIL-WAY) (*Southern part*). Act 43 Geo. III.—The general direction of this line of rail-way is nearly S. by a bending courſe of about 16 miles, in the county of Surrey; upon the chalk-hills or North Downs, it is greatly elevated; its objects are the import of coals and manures, and the export of chalk, lime, fire-ſtone, free-ſtone, flints, fullers'-earth, and agricultural products. Croydon is the 108th Britiſh town, with a population of 5,743 perſons; Ryegate and Godſtone are alſo conſiderable towns on or near this line, which commences in the northern part of the *Surrey iron rail-way* at Croydon turnpike, near the ſouthern end of that town, and terminates at Godſtone, paſſing near to the towns of Merſtham and Ryegate in its courſe. It has a riſe or fall of 1 inch in 10 feet, in croſſing the Downs: near to Merſtham is a conſiderable length of cutting 30 feet deep in ſome places, in order to obtain the proper deſcent; at Smitham-bottom is an embankment of 20 feet high, acroſs a valley, for the ſame purpoſe, with a road-arch under it; it croſſes the Croydon and Merſtham road in another place by an arch, and the road is ſunk conſiderably in order that the rail-way with its proper deſcent may paſs over it. The width of this double rail-way, including a path on each ſide for the carriage drivers is 24 feet. Some of the waggons hereon have their fore-wheels placed quite forward, and the hind-wheels nearly under the middle of the waggon, by which means ſtones, &c. can eaſily be ſhot out of them when required. Near to this rail-way at Merſtham there is a quarry of white ſoft free-ſtone (much ſimilar to the Totternhoe-ſtone on the *Grand-Junction* ſummit branch). The ſhares in this concern are 100l. each. In September, 1801, it was in contemplation to make a branch of this intended rail-way from near Ryegate to the *Arun* river at Wiſborough green; and another branch or rather an extenſion hereof, from near Godſtone to the *Ouſe* upper navigation at Linfield. About the month of June laſt (1805,) this rail-way between Croydon and Merſtham was opened, and 12 waggons loaded with ſtone, weighing 38⅕ tons, were drawn with eaſe by one horſe for 6 miles down the deſcent to Croydon-turnpike, in 1 hour and 41 minutes; from which place the ſame horſe ſet off again with 4 other loaded waggons attached, and perſons riding on them, making in the whole more than 55 tons, which it was ſaid he drew with apparent eaſe!

SWALE RIVER. The general direction of this river is nearly N.W. for about 35 miles, by a crooked courſe in the North Riding of Yorkſhire. Its northern end is very conſiderably elevated, and this river is ſubject to rapid and almoſt uncontroulable floods: its objects are the carriage of coals, and the export of farming products. Aldborough and Richmond are conſiderable towns near, or on this river, which commences in the *Yore* river at Myton; and the navigation was intended to terminate at Richmond. In 1767, Mr. *John Smeaton* was conſulted on the propriety of moving Topcliff mill to a new ſcite, in the deſign which the proprietors of this navigation had adopted of building new mills in ſeveral places, and on which it has been ſaid that 30,000l. was expended, and but a ſmall part of the above line was rendered effectually navigable. Mr. *John Smith* jun. was the reſident engineer. In 1801, the *Topcliff and Pierſbridge* was propoſed to join at Topcliff.

SWANSEA CANAL. Act 34 Geo. III.—The direction of this canal is about N.N.E. for 17½ miles in the counties of Glamorgan and Brecknock, in South Wales. Its northern end is conſiderably elevated: its objects are the export of coals and iron-ſtone, iron, &c. the carriage of lime to the intermediate works and country; and copper-ore, to the works, &c. Swanſea is the 99th Britiſh town, with 6,099 inhabitants. This canal commences in Swanſea harbour, in Swanſea bay, at the mouth of the Tave river, and terminates at Hen-noyadd lime-works: a part of this line between Llandoor brook and Morris town, 1½ mile in length, (called *Morris's canal*) through the eſtate of the *duke of Beaufort*, was conſtructed by that nobleman, who receives the tolls thereof. From near Swanſea to Llanſamlet is a branch of 3 miles in length; and a rail-way branch of about 2 miles to a large coal mine, where an audit or tunnel of 3 miles in length has been made under ground, and out of which 200 tons of coals are daily brought; on an inclined-plane on this branch, near 1 mile in length, the coal-waggons deſcend without horſes, regulated by a convoy or brake, as we have before deſcribed, and the empty waggons are drawn up the plane again by horſes. From the tide-way at Swanſea to oppoſite Pont-ar-Taw, 8¾ miles, is a riſe of 105 feet; thence to Pont Gwaynclawdd, 8 miles, is a riſe of 230 feet; and thence ¾ of a mile to Hen-noyadd is a riſe of 31 feet. An act 44 Geo. III. paſſed for amending two former ones, for building piers, and deepening and improving the harbour of Swanſea, under the direction of captain *Joſeph Huddart*. About the year 1797 the weſtern pier, extending 228 yards into the ſea, was completed; which had the effect of confining the current of the Tave river, and deepening the mouth of the harbour 2 feet: in 1802 this pier was extended 57 yards farther out, and in November 1804 a jetty thereto was completed. In April laſt (1805) a new pier was begun on the eaſtern ſide of the harbour, which is to be extended out and brought round weſtwardly, within 70 yards of the other pier, for effectually ſecuring and ſcouring the mouth of the harbour: dry and wet docks are alſo intended, and by embanking the river, a moſt ſpacious quay is to be formed. From this port, in 1768, only 694 ſhips cleared out; in 1790 theſe were increaſed to 1677 ſhips, and in 1800 to no leſs than 2590 of 134,264 regiſtered tons. Within 2 miles of Swanſea, ſeven large copper-works have of late years been erected, for ſmelting of roaſted ore from the Corniſh and Angleſea mines, brought in ſhips, which return laden with coals for working the mine-engines and roaſting the ore: the number of iron-furnaces, potteries, and other large works near this place are alſo conſiderable. This canal company was authoriſed to raiſe 90,000l., the amount of ſhares 100l. each; and it was provided in the act, that this canal ſhould be completed in 4 years; ſeveral rail-way branches may be made thereto. The engineer was Mr. *Thomas Sheaſly*, and the canal was completed and opened in October 1798. The rates of tonnage may be ſeen in *Phillips*'s 4to. *Hiſtory, Appen.* pages 166 and 167. Boats with leſs than 15 tons, when the water does, and 10 when it does not flow over the lock-weirs, are not to paſs without leave or paying for that tonnage. In the year 1804, 54,235 tons of coal and culver were brought down this canal for exportation, and the groſs tonnage on this canal amounted to 3590l. In Swanſea harbour, the *Swanſea and Oyſtermouth* rail-way connects with this canal.

SWANSEA AND OYSTERMOUTH RAIL-WAY. Act 44 Geo. III.—The general direction of this rail-way is nearly S.W. by a bending courſe, following cloſely the ſea ſhore, for about $7\frac{1}{2}$ miles in length in the county of Glamorgan, in South Wales: its object is the carrying of lime-ſtone, lime, and coals. Swanſea is the 99th Britiſh town, with 6,099 inhabitants. This rail-way connects with the *Swanſea* canal in Swanſea harbour, and proceeds thence to the Mumbles lime-ſtone quarries near Oyſtermouth. In April laſt (1805) this rail-way was nearly completed. There is a light-houſe on the Mumbles point for the ſecurity of ſhips entering Swanſea harbour, which was lately improved.

TAMAR MANURE NAVIGATION. Act 36 Geo. III.—The general direction of this canal is nearly N.W. for about 22 miles, following the courſe of the Tamar river, on the ſouthern coaſt of the counties of Devon and Cornwall. Its northern end is conſiderably elevated: its objects are the import of coals, and ſea-ſand and lime as manures; and the export of agricultural products. Launceſton is the only conſiderable town on this line; which commences in the tide-way in the *Tamar* river at Morwellham quay (the commencement of the *Taviſtock* canal) near Calſtock, and terminates at Tamarton bridge in North Tamarton, with a branch to Rich-mill grove in Launceſton. The *Tamar* is to be made navigable as far as Port-pool near Blanch-Down, before the canal commences. The locks are to be either about 5 feet or $9\frac{3}{4}$ feet wide, and $12\frac{1}{2}$, $24\frac{1}{2}$, or $36\frac{1}{2}$ feet long, in order to receive a number of ſmall boats, in length and ſide by ſide therein, as may be judged beſt. Inclined planes and rail-ways may be ſubſtituted in place of locks on the canal in any part. This company is authoriſed to raiſe 121,000l., the amount of each ſhare 50l. A feeder may be taken from the Tamar river, and all ſprings within 2000 yards of the head level, and within 1000 yards of every other part of the line; 200l. per annum is to be paid by this company to the duchy of Cornwall, for the liberty of making this navigation. We have not been able to learn what progreſs has yet been made in the cutting of this canal. By the act 14 Geo. III. a canal was intended, but never executed, through this line, and extending to the Iriſh Channel, called the *Bude and Launceſton* canal.

TAMAR RIVER. The general direction of this river is nearly north by a crooked courſe of about 6 miles, between the counties of Devon and Cornwall; the tide flows through its whole length; Beer-Aſhton is a conſiderable town near this navigation; which is uſed for the import of coals, ſea-ſand, lime, &c. and the export of ſlate and agricultural products. It commences in *Hamoaze* and terminates in the *Tamar Manure* navigation and *Taviſtock* canal, at Morwellham quay near Calſtock. In the year 1774, an act paſſed for the *Bude and Launceſton* canal intended to connect with this at Calſtock, but it was never carried into execution.

*Tarbeth Canal.* In 1773, Mr. *Watt* ſurveyed the iſthmus between Eaſt and Weſt *Tarbeth* lochs, on the weſt coaſt of Scotland, for a canal to communicate between Loch *Fine* and the ſound of *Jura*; the diſtance of high-water mark in the two lochs he found to be 1 mile, and the height of the ridge between them, 45 feet above high-water at neap tides. Mr. Watt's different eſtimates were, for a canal with locks 7 feet deep, 17,988l.; and for one 10 feet deep and a proportional width, 23,884l. The expences of a thorough cut without locks, of 12 feet deep at high-water, 73,849l., and for one of 15 feet deep, 120,789l. A very large canal has ſince been formed about 13 miles north of this, called the *Crinan* canal, which more effectually anſwers the purpoſe of communication between Loch *Fine* and the ſound of *Jura*.

TAVISTOCK CANAL. Act 43 Geo. III.—The general direction of this canal is N.E. for about $4\frac{1}{2}$ miles in the county of Devon; great part of it is conſiderably elevated above the level of the ſea: its objects are the export of ſlate, copper-ore, and other minerals, and of agricultural products; the import of coals, lime, and other articles for the ſupply of Taviſtock town and the ſurrounding country; and to facilitate the working of the mines in Morwellham down: this canal commences in the tide-way in *Tamar* river (near the commencement of the *Tamar Manure* navigation) at Morwellham quay new baſon, near Calſtock, and terminates at the town of Taviſtock. From Crebar near the north end of the tunnel, it has a branch of 2 miles to the ſlate quarries at Mill-hill bridge. From the *Tamar* river, $\frac{1}{8}$ of a mile is level with high-water at Morwellham quay; thence in $\frac{1}{4}$ of a mile, is a riſe of 237 feet; thence, about $3\frac{1}{8}$ miles to Taviſtock is level; the branch is level to New Quarry, about $1\frac{5}{8}$ miles; thence to Mill-hill bridge, $\frac{3}{3}$ of a mile, is a riſe of $19\frac{1}{2}$ feet. The locks upon this canal are to be calculated in length and width for the uſe of boats of $12\frac{1}{2}$ feet long, and 5 feet wide, either ſingly or ſeveral together, as on the *Tamar Manure* navigation above mentioned: but the company have the power to erect inclined-planes for boats, or boxes of goods, inſtead of locks, if they think fit. Through Morwellham down, which is of hard rock, and ſuppoſed to be interſected by ſeveral fiſſures, or loads filled with metallic ores, is to be a tunnel about 2500 yards long, and about 460 feet beneath the higheſt point of the down in its courſe: near Crebar is to be an embankment and aqueduct bridge 60 feet high, acroſs the Lumbourn river; which is to have a new courſe cut for it for a conſiderable diſtance near the branch of this canal below New Quarry. This canal is to be fed from the Tavy river at Taviſtock, and by any ſprings or ſtreams within 5000 yards of the line. Mr. *John Taylor* is the engineer to this canal and tunnel, which paſſes entirely through the eſtate of the *duke of Bedford*, who has leaſed to this company the mines which may be found in the tunnelling, or within certain diſtances of this canal. In February laſt

(1805) about 300 yards in length of the tunnel had been cut, and a known load of copper-ore had been interſected therein, which gave the beſt hopes of diſcovering other unknown ones, as the work proceeds. This company is authoriſed to raiſe 50,000l., and the amount of each ſhare is 50l. The rates of tonnage are for lime-ſtone conveyed through the tunnel, 1s. 3d. per ton; for building-ſtone, ſlates, bricks, tiles, clay, ſand, earth, dung, ores, iron, and metals (made marketable) conveyed through the tunnel, 2s. per ton; and for coals, coke, culm, lime, timber, bark, corn, grain, and all other goods paſſing through the tunnel, 3s. per ton; building-ſtone, ſlate, &c. as above, carried on the whole, or any part of this canal, or its branches, except in the tunnel, 1s. per ton; and coals, coke, &c. 1s. 6d. per ton. The laſt rates are not to be charged on any goods either carried or ſubſequently removed on any part of this canal, which have before paid the tunnel rates: and ores may be carried to the dreſſing-floors, or the waſte or rubbiſh of mines or loads be removed to proper places on any part of this canal or its branches, free of tolls. Beſides the above rates, all goods which paſs into, or from the *Tamar* river, and are not loaded at Morwellham quay, are to pay as follows for reimburſing the owner and occupiers thereof, for the loſs of wharfage on ſuch goods, viz. ſlate 3d. per ton, lime-ſtone 6d. per ton; ores, (made marketable) iron, bricks, tiles, clay, ſand, earth, and dung, 6d.; and all other goods 1s. per ton; and over and above this, one penny per ton is to be paid on all goods entering the canal baſon at Morwellham. The *duke of Bedford* may make collateral branches or rail-ways to this canal in any part.

TAVY RIVER. The general direction of this river is N.E. for about 2¾ miles in the county of Devon; the tide from the ſouth coaſt flows through its whole length: its objects are the import of coals, ſea-ſand, &c. and the export of ſlate, copper-ore, &c. It commences in *Hamoaze* and terminates at Lophill quay.

TAW RIVER. The direction of this river, or eſtuary, is nearly eaſt for about 8 miles on the north-weſt coaſt of Devonſhire: the tide flows through its whole length: its objects are the ſupply of Barnſtaple and the adjacent country with coals and other articles, and the export of farming products. This navigation commences in St. George's Channel, at Biddeford bay, and terminates at the town of Barnſtaple: near to Appledore the *Torridge* river joins this navigation.

TAY RIVER. The general direction of this river, firth, or eſtuary, is nearly weſt for about 26 miles, between Angus and Fife, and in the county of Perth in Scotland. The tide flows through its whole length: its objects are the ſupply and trade of Dundee and Perth, and the adjacent country. Dundee is the 18th Britiſh town, with 26,084 perſons, and Perth the 26th, with 14,878 perſons. This firth commences in the German Ocean, and terminates at Perth bridge. This bridge, built of ſtone by Mr. *John Mylne*, was ſwept away by a rapid flood in 1621. In 1763, Mr. *John Smeaton* was conſulted on the building of a new bridge; and in 1766 he began one of 7 arches, where the river was 893 feet wide: the depth of the Tay at this bridge at neap tides in dry ſeaſons was only 2 feet, at ſpring tides 10 feet deep. At Stanley, 7 or 8 miles higher up this river, three ſoughs or tunnels of conſiderable length (one of them from 12 to 9 feet wide arched with ſtone) are driven through the hill, which occaſions a great loop in the river, by which 24 to 20 feet fall is gained, for a large portion of the ſtream, to work cotton-mills and other machinery; and running in this ſubterraneous channel it never freezes.

TEES RIVER. The general direction of this river is nearly S. E. by a crooked courſe of about 12 miles, between the counties of York and Durham: the firſt four miles are by a very wide eſtuary: the tide flows through its whole length: its objects are the trade of Stockton, and the export of agricultural products. Stockton is a conſiderable town on this river; which commences in the German ocean, at Seaton Nook, and extends to the town of Stockton. In the preſent autumn there was an intention of improving this navigation. In 1803, the foundations were laid for an iron-bridge, to be erected under the direction of Mr. *Thomas Wilſon*, over this river at Yarm, a few miles above Stockton, in place of an old ſtone-bridge, whoſe clumſy piers had long obſtructed the current, and occaſioned the river frequently to overflow its banks. In 1768, the *Winſton and Stockton* canal was propoſed for extending this navigation weſtward to the coal diſtrict about Winſton.

TEIGN RIVER. The direction of this river, or eſtuary, is weſt for about 4½ miles in the ſouth-eaſtern coaſt of Devonſhire: the tide flows through its whole length: its objects are the import of Newcaſtle or Welſh coals, and the export of potters' clay, bovey-coal, and agricultural products: it commences in the Engliſh channel, and terminates at Newton-Abbots, at the commencement of the *Stover* canal, near to Newton-Buſhel.

*Ternbridge and Winsford.* In 1765, Mr. *Whitworth* propoſed a canal from the *Severn* river at Ternbridge below Shrewſbury, to the *Weaver* navigation at Winsford, 63½ miles, in the counties of Salop, Stafford, and Cheſter, with a branch therefrom, near Bridgeford; 43 miles, to the *Trent* river at Wilden-Ferry. From the *Severn* to the ſummit or grand-ridge (requiring 25 feet deep cutting,) below Offley-Park, 24 miles, is a riſe of 136¾ feet; thence to the Trent branch, (1¼ mile below Bridgeford,) 7¼ miles, is a fall of 54⅔ feet; thence to the ſummit or grand-ridge again, (requiring 25 feet deep-cutting,) in Madeley park, 10½ miles, is a riſe of 800¼ feet; thence to the *Weaver* navigation, 22¼ miles, is a fall of 284 feet: the branch from Bridgeford to the Trent has a fall of 209⅓ feet. The courſe of this canal is by Wansford, Allſcot, Crudgington, Chetwin-park, Batchacre-Grange, Eccleſhall, Standon, Wyburnbury, and Barten-croſs, near Nantwich. The branch is conducted by Stafford, Tixall, and thence following within a ſmall diſtance the courſe of the Trent river. This canal was propoſed to be 27 feet wide at top, 18 at bottom, and 5 feet deep, with a towing path on both ſides; the locks 60 feet long and 13 wide, and about 10 feet riſe each: the boats of 50 tons burthen: 78 road bridges, and 25 accommodation bridges were thought neceſſary, and 162 aqueducts and culverts: the eſtimated expence was 99,800l. The *Staffordſhire and Worceſterſhire* and the *Trent and Merſey* canals, which were adopted in the following year, embrace all the general objects of this canal. The *Sandbach*, and the *Newport and Stone*, have ſince been propoſed to occupy parts of the ſouth-weſtern end of this line, but, like this, were over-ruled.

THAMES RIVER, (*lower part*). Acts 19, 29, 39, 42, 43, 44, and 45 of Geo. III.—This fine river, by far the moſt important for trade, not only in Britain but in the whole world, has its career nearly weſt for about 72 miles between the counties of Kent and Eſſex, and Surry and Middleſex. The firſt 20 miles is by an exceeding wide eſtuary; the next 21 miles is ſtill an eſtuary of conſiderable width; the remaining 31 miles is crooked, and gradually diminiſhing: the tide flows very powerfully through its whole length. To enumerate its objects would be to recount almoſt every ſpecies of trade and commerce which is carried on in

Europe. At Eaſt Merſey it connects with the *Colne* river; at Weſt Merſey, with *Blackwater* river; at Foulneſs eaſt point, with *Crouch* river; at Whitſtable and at Sheerneſs, with the *Medway* river; at Graveſend, with the *Thames and Medway* canal; oppoſite to Purfleet, with the *Darent* river, or Dartford creek; at Bow-Creek, with the *Lea* river; at Blackwall and at Limehouſe-hole, with the *Iſle of Dogs canal*, (a new ſide-cut for ſhortening the navigation of this river); at Greenland-dock, and at Wilkinſon's gun wharf, Rotherhithe, with the *Grand Surry* canal; and, at Limehouſe, with the *Limehouſe* canal. London, the firſt Britiſh town, has a population of 864,845 perſons; Greenwich is the 31ſt, with 14,339 perſons; and Woolwich is the 53d, with 9,826 perſons; Margate, Feverſham, Milton, Queenborough, Sheerneſs, Leigh, Graveſend, Grays-Thurrock, and Deptford, are alſo conſiderable towns on or near this lower part of the *Thames* river; which commences in the Engliſh channel at Eaſt Neſs near Margate, and terminates in the *Thames*, middle part, at London-bridge. Large ſhips of war can come up to Deptford, and merchants' ſhips of 7 to 800 tons burthen frequently lie at the keys cloſe to London-bridge. The port of London, or part wherein the ſhips lie, generally called the pool, extends almoſt 4 miles, nearly to Deptford, in which ſpace more than 1000 veſſels have been ſeen moored at one time! the rapidly increaſing trade of this grand emporium of commerce, the regulations which have of late been made, for mooring the ſhips at more convenient diſtances, for a paſſage up and down the river, and the contiguity of the *Weſt India* and *Eaſt India* docks to Blackwall are expected ere long, to extend the tiers of ſhips as far as that place. It was ſtated, in the year 1800, that the trade of the port of London had increaſed in the laſt, or 18th century, by 6547 veſſels and 1,327,763 tons annually; and that (including repeated voyages,) 13,144 ſhips and veſſels were then employed in this trade, to foreign countries, the colonies, and coaſtwiſe, beſides 2288 lighters, barges, and punts, employed in the middle part of the *Thames*, and on the *Lea* river, and 3336 of the like kinds of veſſels uſed below bridge, in the lading and diſcharging of veſſels, together with 83 boats, ſloops, cutters, and hoys, 3000 watermen's wherries, 155 bum-boats, and 194 peter-boats, the total number, (excluſive of ſhips of war, tranſports, and navy and victualling and ordnance hoys,) being 22,500 veſſels of various ſizes and dimenſions, either trading to, or ſtationed within the pool or port of London; the total value of the goods imported and exported annually by them exceeding 67,000,000l.! The corporation of the city of London, as conſervators of the river *Thames*, and under the ſpecial authority of the above acts, are, at this time, carrying on conſiderable works for the improvement of this river: ſeveral mooring chains in the pool have been purchaſed of lord Guydir and others, and a harbour-maſter, approved by the Trinity-houſe, is appointed to regulate the mooring and conduct of veſſels, agreeable to the 19, 29, and 39 of Geo. III.: one of the largeſt canals ever attempted has been cut, near 1¼ mile in length, 142 feet wide at top, and 24 feet deep! acroſs the *Iſle of Dogs*, for ſhortening the paſſage of veſſels to and from the pool, and to avoid the long circuit by Greenwich and Deptford; Mr. *William Jeſſop* is the engineer, under whom the locks and other works of this canal were ſucceſsfully conducted and nearly finiſhed, when an unforeſeen accident, by the blowing up of the coffer and preventer dams, juſt as the entrance locks were completed, on the 24th of July laſt, (1805) prevented this canal from being opened until the 9th of December, when the Ducheſs of York, Weſt Indiaman, of 500 tons burthen, paſſed through the ſame, in preſence of the lord mayor and corporation of London. Several large ſums of public money have been granted by the above acts out of the conſolidated fund; for the repayment of which veſſels paſſing through this canal of 200 tons or upwards are to pay 2d. per ton; thoſe from 200 to 100 tons, 1½d. per ton: from 100 to 50 tons, 1d. per ton; 50 to 20 tons, 5s. each, and boats and craft 1s. each. Two or more piers are intended to be built at the entrance, for facilitating the entrance of veſſels to this canal. Between this canal and the entrance of the *Eaſt India* docks, there is a large maſs of ſilicious pudding-ſtone, conſiſting of chert pebbles imbedded in a very hard cement, which lies in the bed of the river, and has proved fatal to ſeveral ſhips, on which account the committee, in September 1802, and on ſeveral other occaſions, advertiſed for perſons who would undertake to lower this rock 18 feet, its length being about 40, and breadth 30 feet; the newſpaper accounts of the Boddington Weſt Indiaman having ſtruck on this rock on the 12th of September laſt appear to be incorrect, the rock being now ſurrounded by piles and booms, ſo that no ſhip can approach it. In the year 1773, Mr. *James Sharp* ſuggeſted the propriety of floating, or wet-docks, for the loading and unloading of ſhips in the Iſle of Dogs; after much diſcuſſion a plan was adopted for this purpoſe, in the year 1799, called the *Weſt India Docks*, and Mr. *William Jeſſop* and Mr. *Ralph Walker* were employed as engineers. On the 12th of July 1800, the firſt ſtone of this great undertaking was laid with much ceremony. On the 22d July 1802, an unfortunate accident occurred by the burſting of the coffer-dam at the entrance at Blackwall, but which did not prevent the great or import dock, from being opened for the uſe of Weſt-India ſhips on the 3d of September 1802. This fine dock, the largeſt in Britain, is 2600 feet long, 510 feet wide, covering more than 30 acres of ground; its depth being 29 feet, and it is walled in the moſt ſubſtantial manner with bricks, and coped with immenſe blocks of ſtone. Three ſtacks of the ſuperb warehouſes on the banks of this dock were completed at this time: on the 22d of Auguſt 1803, ſeveral other warehouſes on the N. ſide of the dock were finiſhed, and declared ready for public uſe; and, on 5th July laſt, two warehouſes on the ſouth ſide, and the whole of that quay were completed. The outward-bound dock, 2600 feet long, 400 feet wide, and 29 feet deep, has been rapidly proceeding ſince the completion of the great dock, and is now almoſt ready, we believe, for opening. At Blackwall, and at Limehouſe-hole, there are ſpacious entrance baſons, connecting by tide-locks with the *Thames* river; from theſe entrance baſons there are locks into the outward and inward, or export and import docks: theſe docks are calculated for the accommodation of 300 ſhips, 12 of which can conveniently enter or go out in one tide: there are to be ſix immenſe ranges of warehouſes in the whole, with cellars, cranes, and every poſſible convenience: the whole is to be ſurrounded with a wall 30 feet high, and a wet foſs 12 feet broad, and 6 deep: for ſecurity from fire, no dwelling-houſes or work-ſhops are to be built within or near to the boundary wall; no gunpowder is to be ſuffered to enter the walls, or any fire, candles, or lamps to be lighted within the ſame, except the neceſſary ſtreet-lamps on the quays. The company were at firſt authorized to raiſe 600,000l. the amount of ſhares being 500l. each, which, in 1802, bore a premium of 28l. per cent.: the profits to the ſubſcribers are limited to 10 per cent.: ſeveral loans of the public money from the conſolidated fund have been made towards completing this deſign. Mooring-chains are provided in the river oppoſite the entrance baſons, for the uſe of ſhips entering theſe docks, in which all Weſt India goods whatever (except tobacco in ſome caſes,) are to be landed, and all outward-bound ſhips for the Weſt-Indies are to load herein, or in the *Thames* at Blackwall ; but the tonnage for the building and maintenance of theſe docks is, (by 39 Geo. III.) not levied excluſively on the Weſt India trade, as every veſſel both on its inward and outward voyage (except coaſting veſſels under 45 tons, king's ſhips, corn, fiſhing, and paſſenger veſſels, and craft navigating above Graveſend,) is to pay : coaſting veſſels at the rate of 1d. per regiſter ton ; and ſhips trading to parts beyond the ſeas are to pay higher rates, amounting, in ſome caſes, to 3½d per ton ; ſee the particulars, as alſo the rates for wharfage, warehouſe-room, cooperage, &c. in the *Agricultural Magazine*, vol. i. p. 115. Mr. *Robert Edington*, in his *Eſſay on the Coal Trade*, 1803, after eſtimating 4284 coal-ſhips to enter the port of London annually from the neighbourhood of Newcaſtle-upon-Tyne, with 1071 chaldrons each, on the average, (a quantity conſiderably ſhort of the actual importation, ſee *Monthly Magazine*, vol. xvii. p. 99, and vol. xix. p. 99.) objects ſtrongly to the above rate, which annually taxes the coals conſumed in London and its vicinity with 4284l., on account of theſe docks, which they are not allowed to enter. For the general accommodation of ſhips unloading and loading in the port of London, another ſet of docks was, after much diſcuſſion, undertaken, in the year following, called the *London Docks*, (or ſometimes the Wapping Docks,) Acts 40, 44, and 45 of Geo. III. Mr. *John Rennie* and Mr. *Alexander* were the engineers employed ; on the 26th of June 1802, the firſt ſtone of theſe works was laid, by Mr. Addington, the then miniſter ; and the ſame proceeded without any diſaſter or impediment, until the great dock, the entrance baſon, and ſeveral of the warehouſes were completed, and opened for uſe on the 1ſt of February laſt (1805). The great dock is about 1260 feet long, and 830 feet wide, and covers about 24 acres of ſurface : it is 29 feet deep from the top of the walls ; but the depth of water is only 23 feet ; the walls are of brick, coped with ſtone, and every part of the work is executed in the moſt complete and maſterly ſtile. On the northern ſide of the dock there is an open ſhed the whole length, for examining and weighing and the landing of goods, under cover from the weather, from whence a number of ſmall trucks moving on rail-ways convey them to five immenſe ſtacks of warehouſes behind them, or the cranes hoiſt them into carts, as may be wanted. Near the S. E. corner of this dock are two immenſe warehouſes let to government for the ſtowage of tobacco ; one of them is 762 feet long, and 160 wide, the other 250 feet long, and 200 feet wide, each being in one ſingle room, without any partitions, and their roofs are ſaid to exceed 6 acres of ſlating ; they are but one ſtory high, but have ſpacious arched vaults under them of the ſame extent, for the ſtowage of wine, oil, ſpirits, &c. Other large ranges of warehouſes are to be built, and their fronts have been begun north of the preſent range of warehouſes ; the windows and doors of theſe laſt being bricked up, ſerve as a temporary wall to encloſe the premiſes : warehouſes are alſo intended on the weſt and ſouth ſide, where the high temporary fence-wall at preſent ſtands. The only entrance at preſent to this dock, from the *Thames*, is near to Bell-dock in Wapping, where two maſſive piers of ſtone project into the river, and have a tide-lock between them, and further north is a curious iron double ſwing-bridge, in the line of Wapping-ſtreet, which we have already deſcribed ; within this is the entrance baſon, of an irregular figure, of about 3 acres extent : this baſon is connected with the river at every high-water, by the opening of the gates, which ſhut again and retain the water at that height ; from this baſon ſhips lock up into the great dock, whoſe ſurface is kept about 3 feet above the height of ordinary tides, by a powerful ſteam-engine erected on the eaſt ſide of the entrance baſon for that purpoſe, and the bottom of the dock is about 15 inches above low-water mark in the river. There is deſigned to be another entrance from the *Thames* by means of Hermitage-dock, into the great dock at its S.W. corner ; and from near the oppoſite or N.E. corner, proviſion has been made, and the connecting canal formed, which is to join it with another large dock, intended to be dug, and connect with the *Thames* at Shadwell. Notices were given in September laſt of an application to parliament for further powers, to proceed with the above works. The preſent dock is capable of accommodating 200 merchant ſhips, and the entrance baſon will hold a vaſt number of ſmall craft, without impeding the paſſage of ſhips to or from the great dock. The whole of the docks or warehouſes are, when completed, to be ſurrounded by a very high wall to prevent depredations or the communication of fire, againſt the happening of which the ſame regulations are adopted as at the Weſt-India dock above mentioned. Six large mooring chains are fixed at proper diſtances from each other in the great dock for ſhips to moor to, conſiſting of very large floating blocks of deal timber. This company were authoriſed by their firſt act to raiſe 1,500,000l., the amount of each ſhare being 500l. They were required to purchaſe the concern of the Shadwell water-works for 50,000l. ; and ample proviſions are made for compenſating the owners of the river-quays, the proprietors of ſtreet-cart licences, &c. : and full accounts of the receipts and expenditure of this company, and of the Weſt-India dock company, are to be preſented annually to parliament. The tolls or rates payable to this company, by ſhips which enter their docks, are for Britiſh coaſting veſſels (including colliers) 1s. per ton ; five other claſſes of ſhips are enumerated, which are to pay from 15d. to 30d. per ton ; ſee *Agricultural Magazine*, vol. iii. p. 162. For the landing, loading, and houſing, and for ſhipping of goods of every different kind, the ſame ſums reſpectively are to be taken by this company, as were uſually paid at the different quays of the port of London in the year 1798. The whole of the ſcite of theſe docks was covered either with ſtreets and houſes, or with gardens, and which the company had to purchaſe for immenſe ſums of money. For the particular accommodation of the large ſhips belonging to the Eaſt-India company, a third ſpacious ſet of docks has been deſigned, and in the 43 of Geo. III. an act paſſed for enabling the company to raiſe 200,000l. for the purpoſe of building the *Eaſt-India Docks ;* and to purchaſe the dock belonging to Mr. Perry's maſt-houſe at Blackwall, for their entrance baſon. Mr. *Ralph Walker* is the engineer ; and on the 4th of March laſt (1805) the firſt ſtone of this great undertaking was laid by captain Joſeph Huddart, and the works are now proceeding with the utmoſt expedition : the largeſt, or import dock, is to cover 18 acres of ground, the export dock is to be 9 acres in content, and the entrance baſon about 3 acres : the depth of theſe docks is to be greater than either the *London* or the *Weſt-India* docks ; the entrance locks now building are 48 feet wide in the clear, and each gate is to be 27 feet wide. Near to Deptford, *Greenland-Dock* has its entrance, by a tide-lock, into the river *Thames ;* this dock is about 900 feet long and 400 feet wide, and was conſtructed ſeveral years ago, for the accommodation of ſhips employed in the Greenland, or whale fiſhery, with ſuitable conveniences at proper diſtances for melting and refining their oil. It is intended that the *Grand Surry* canal ſhall have a cut into, and a paſſage for its barges, through this dock : and the ſame company are now excavating a dock near the termination of their canal, at Wilkinſon's gun-wharf, Rotherhithe, which ſeems to be intended to admit ſmall ſhips from the *Thames*. At Deptford, Woolwich, and at Sheerneſs there are ſpacious dock-yards and naval arſenals on the banks of this river, and others at Chatham, within a few miles of it, on the *Medway* river. In the year 1800 it was propoſed to make a large dock and yard, for repairing ſecond and third rate ſhips of war, of which *Major General Bantam* has the direction, near the ſalt pans on the *Iſle of Grain*, on the *Medway* ſide of it: its principal object is for repairing the ſhips ſtationed in the Downs and North Seas. In the year 1804 it was propoſed to form a wet-dock, of about 12 acres extent, connecting with the *Thames* river, by *Northfleet* creek near Graveſend: the ſcite of the old chalk pits is intended to be excavated for this dock, in which the new ſhips of war built at Deptford, Woolwich, and Chatham are to be received to be rigged and fitted for ſea, inſtead of ſending them to Sheerneſs; that the arſenal there may be wholly appropriated to the victualling and ordnance department. A pier is now building for the protection of *Sheerneſs* harbour, under the authorities of the acts of 41 and 43 of Geo. III. At Margate, there was an ancient wooden pier in this river, for the protection of the hoys and veſſels trading to that place, but in 27 Geo. III. an act paſſed for an excellent ſtone pier, which has ſince been there erected. The great diſtance which the inhabitants of Graveſend, and Grays-Thurrock, and all thoſe parts, have to travel (over London bridge) to communicate with each other by land, gave riſe, in May 1798, to the propoſition by Mr. *Ralph Dodd* for a tunnel, or road-arch, under the *Thames*, from near Graveſend to Tilbury Fort (ſee Nicholſon's Journal, 4to. vol. ii. p. 473.); and an act of 49 Geo. III. paſſed to authoriſe the raiſing of 50,000l., in 100l. ſhares, for the *Thames Tunnel*, and to levy 2s. 6d. on each coach, 4s. on each waggon, 2s. on each cart, 1s. on each horſe, 2d. on each foot-paſſenger, and ſome other tolls, for paſſing through this tunnel. Government to pay 1000l. annually, in lieu of all tolls, for the paſſage of troops and of government ſtores of every kind: 80l. to be paid annually to his majeſty, and 30l. to the corporation of Graveſend and Milton, in lieu of the right of ferries, near the intended tunnel, to which they are entitled. Mr. *Dodd* propoſed his arch to be a cylinder of 16 feet diameter in the clear, and eſtimated that the ſame might be executed for 16,000l., the length of the tunnel being 900 yards; but it does not appear that at this time, or for more than two years after, any borings had been made, even on the ſhore of the river where the tunnel was intended, to prove whether the chalk rock, which Mr. *D.* had calculated upon tunnelling in, exiſted or not: at length, about September 1800, a bed of chalk, *ſuppoſed* to be the ſame which appears on the ſurface at Graveſend, was diſcovered, by Mr. *D.*'s borings, at 72 feet beneath the ſurface, at Tilbury Fort; a ſteam-engine was thereupon erected, and a perpendicular ſhaft of 146 feet deep was ſunk at Graveſend, all in chalk; when, by one of thoſe *unaccountable accidents* to which abortive ſchemes ſeem peculiarly liable, this engine-houſe took fire, and was burnt down, and ſhortly after the ſcheme was given up altogether. In the laſt ſeſſion of parliament (45 Geo. III.) an act paſſed for making other archways under the *Thames*, for the paſſage of carriages and foot paſſengers, between Rotherhithe and Limehouſe; and we have ſince read that Mr. *Robert Vazie* is the engineer to theſe *Rotherhithe archways*, that the footway arch is to be made a little to the weſt of the *London-Dock* entrance, and the carriage-way arch at the ancient horſe-ferry between Limehouſe and Rotherhithe. On inquiry, we have been told, that the preſent ſcheme is, to ſink a ſhaft on one ſhore of the *Thames*, with an engine thereon and pumps, and to continue the ſame to a ſufficient depth, at which to begin the tunnel in oppoſite directions, riſing to the oppoſite ſhore of the river one way, and to a point ſufficiently inland the other way, for a regular and proper aſcent for carriages. We can hardly ſuppoſe that this matter has proceeded thus far, without its being aſcertained, by a ſeries of borings, quite acroſs the river, at ſhort diſtances from each other, that there is no fiſſure or crack in the clay, beneath the alluvial matters, which may be filled up with quickſand or other looſe ſoil impracticable to tunnel through, under the bed of a river: but, if we admit the whole matter to be ſolid clay under the water-way or bed of the river, yet the number of houſes which muſt be pulled down, or endangered, oppoſite to the tunnel, in this way of conducting the buſineſs, in order to bring the archway to the ſurface on one ſide of the river, and the inconvenient diſtance which that entrance will be from the water-ſide, are almoſt inſuperable objections to its adoption. We have no doubt of the practicability of forming as many arch-ways under the *Thames* as may be wanted (if money is not ſpared, and ſcientific and proper men are employed on the work), but are of opinion that for ſuch to ſucceed, the river muſt be piled off, for ſhort lengths at a time, while the neceſſary excavation is made in the bottom for turning a length of the arch, and ſecurely covering it with clay or puddle: and after ſeveral ſucceſſive lengths are thus formed, the water and traffic of the river may be admitted over the part which is completed. Very powerful pumping-engines will be neceſſary, in this or any other way of conducting ſuch a work with the probability of ſucceſs. The *Thames* river, below London, is embanked through a great part of its courſe; the time when theſe banks were firſt erected is uncertain, but they appear to be of great antiquity; and during ſeveral hours of each tide, the adjoining meadows are 10 feet or more below the level of the water. At Dagenham, about 7 miles below Blackwall, a large breach in one of theſe banks happened, which captain *John Perry* ſucceeded in ſtopping, after ſeveral others had failed in their attempts. On the 5th of Auguſt 1776 the plan was firſt adopted of employing *convicts* in ballaſting, and other works for the improvement of the river *Thames*, under Mr. *Duncan Campbell*; theſe men, properly ironed, are lodged in hulks, or old veſſels, off Woolwich, and have principally been employed in enlarging the wharfs at Woolwich Warren, or Royal Arſenal, which work is ſtill proceeding. In the year 1785, and again in 1802, the *London Lynn and Norwich* (or North London) canal was propoſed to join the *Thames* river at Limehouſe. In 1798 a new channel was propoſed to be cut for the *Thames* river ſtraight acroſs the Iſle of Dogs, and dams with ſluices and locks to be made on the old courſe of the river, for converting the ſame, round the iſland by Deptford and Greenwich, into one vaſt floating dock for ſhips! About the ſame time, the *London Docks* were in contemplation, and a canal was propoſed to extend from them to the *Thames* river at Blackwall; the *Iſle of Dogs* canal has ſince been made, and in part anſwered both theſe purpoſes. In 1802 the *Canterbury and St. Nicholas-Bay* canal was propoſed to join the *Thames* at the latter place; and in the ſame year the *London and Waltham-Abbey* canal was intended to join at Bell-wharf in Shadwell. The *Thames and Medway* proprietors pay 1s. annually as an acknowledgment to the city of London, as conſervators of the *Thames* river, for the liberty of connecting therewith.

Thames River (*middle part*). Acts 14 and 17 Geo. III. —The general direction of this part of the Thames river is nearly weſt, by a very crooked courſe of 37 miles between the counties of Surrey and Middleſex; the tide flows through the firſt $16\frac{1}{2}$ miles thereof to Richmond bridge: its objects are the ſupply of London, and the immenſe trade which is carried on with the rivers and canals weſtward: at Vauxhall creek it is joined by the *Grand Surry* canal; at Wandſworth entrance-baſon, the *Surry Iron Rail-way* joins; at Brentford Creek the *Grand Junction* canal joins, and at Ham Haw, near Shepperton, the *Wey* river joins (2 miles from the junction with the *Baſingſtoke* canal). London, the firſt Britiſh town, has 864,845 perſons; Wandſworth, Brentford, Kingſton, Chertſey, and Staines are alſo conſiderable towns on this part of the *Thames* navigation; which commences in the *Thames* lower part at London bridge, and terminates in the *Thames and Iſis* navigation at London-ſtone, at the extremity of Middleſex county, about ½ a mile above Staines bridge; from near Chelſea, Pimlico creek extends for about ¾ of a mile to Chelſea water-works engine. From low-water at Richmond bridge to London-ſtone, 20½ miles, is a riſe of 36 feet; ſee a ſection thereof in *Gentleman's Mag. March*, 1771, and in *Zachary Allnutt's Conſiderations on the Thames River*, 1805, wherein it appears, that the navigation hereon is in two or three places interrupted by ſhallows, not exceeding 2 feet 9 inches depth of water in ordinary times. At Laleham, Mr. *John Rennie* gauged the ſtream of this river, in the dry ſeaſon of 1794, and found 1155 cubic feet of water per ſecond to be then paſſing down. The corporation of the city of London, as conſervators of the river *Thames*, and by the 17 of Geo. III. above, were unauthoriſed to make any new ſide-cut by this part of the river, or to erect any weir quite acroſs the channel of the river; and their exertions for the improvement of this navigation, ſo much in need of amendment, have been confined to the erecting of jetties and weir-hedges, for contracting the breadth of the ſtream in many of the ſhallow places, to the dredging or ballaſting of others, to deepen the channel, and to the eſtabliſhing of regular fluſhes of water, twice a week, or oftener, from the pounds and mill-dams in the upper part of the river, for enabling barges, during the run of ſuch fluſhes, to paſs the ſhallow places; except, that they have completed a good horſe towing-path through the whole length of this navigation, beginning at Putney bridge, on the ſouth ſhore of the river: immenſe ſums of money (upwards of 1400l. per annum) having been expended on the above inefficient meaſures, and yet the navigation in all dry ſeaſons continues intolerably bad, and alſo frequently interrupted and rendered dangerous by floods. We are happy to obſerve, that notices were given in September laſt (1805) for an act to authoriſe the making of weirs acroſs the river, and ſide-cuts and locks, in the pariſhes of Laleham, Littleton, Shepperton, Sunbury, Chertſey, and Thorpe. The above act (17 Geo. III.) authoriſed the city of London to purchaſe certain local tolls on the navigation between Staines and Richmond, and to levy 4d. per ton per voyage up and down, for the above purpoſes; they have a commodious barge ſtationed on the river for the reſidence of a collector of this toll, and an annual account of all the receipts and diſburſements under this act is preſented to parliament. The *Grand Surry* canal was (by its act 41 Geo. III.) required to pay 2 guineas as a fine, and a rent of 60l. annually, for the liberty of connecting with this navigation; and the *Croydon* canal 40l. per annum; the *Surry Iron Rail-way* is to pay 10l. per annum; and the *Grand Junction* company are to pay 600l. per annum, and a toll of ½d. per ton on all goods which paſs into or out of this canal. Among the bridges upon this navigation, *London Bridge*, at its commencement, built of ſtone in 1209, comes firſt to be noticed: the river at this place is about 900 feet wide, the bridge, which is 60 feet high and 74 feet wide, conſiſts of 19 arches, the middle one of which is 72 feet wide, but the next thereto on each ſide are narrow ones, and no regular order is to be obſerved in the arrangement of the arches, which are moſt of them of different widths, under 20 feet; the piers between them are immenſely thick, being alſo ſurrounded with ſtarlings or vaſt frames of piling and croſs beams of timber, intended for the protection of the foundations of the bridge: previous to the making of the large lock or centre arch, in 1756 (by the removing of a pier and its ſtarling, and turning one large arch inſtead of two) the clear water-way between all the ſtarlings amounted but to 194 feet, and above the ſtarlings (which are covered when the tide has riſen about two thirds of its uſual height) the water-way amounted to only 450 feet, or half the width of the river; a further obſtruction alſo ariſes from the water-wheels, which are fixed on the upper ſide of the bridge at both of its ends, oppoſite to ſeveral of the arches, for pumping up water for the ſupply of the city of London and Borough of Southwark. By theſe contractions of the water-way, a fall and current is occaſioned under this bridge, which for ſeveral hours of each tide is quite tremendous, and proves a moſt ſerious obſtacle to navigation, as well of danger to the bridge itſelf. If Mr. *John Smeaton*'s advice had not been quickly followed, in 1756, in returning and throwing in the ſtones, which had been recently taken up from the old middle pier, together with many cargoes of other large and rough ſtones, the adjoining ſtarlings and piers of the great lock would certainly have been undermined, and the bridge have fallen: great quantities of chalk and Kentiſh rag-ſtones are now annually brought and depoſited within the piling of the ſtarlings, and between them, at the time they are repaired; a work for ever requiring to be done, in ſome part or other, of theſe clumſy obſtructions to the waters and to navigation: immenſely deep gulphs are formed at each ſide of the bridge by the pitch or fall of the water, and the ſoil and rubbiſh excavated therefrom is continually thrown up at a diſtance, ſo as to form large banks dry at low-water, in ſpite of a continual dredging or ballaſt-heaving, which is reſorted to for removing them. Theſe inconveniences, which had been long and loudly complained of, occaſioned, about the year 1799, a propoſal, for pulling down this bridge, and ſubſtituting two ſtone bridges, with capacious arches: theſe were to be placed near to each other and to connect at their ends; the centre arch of each was to have a draw-bridge, for admitting ſhips up the river, as far as Blackfriars bridge; the intention of the two bridges being, that one of the drawbridges might always be ſhut down for the paſſage of carriages and perſons, while ſhips might be paſſing through the other into or out of the baſon between the bridges. Another propoſal was, to conſtruct a caſt-iron bridge of one ſingle arch of 600 feet ſpan and with 65 feet clear opening above high water; as we have already mentioned: theſe, and other projects for the ſame purpoſe were minutely and carefully examined by a ſelect committee of the houſe of commons, and their reports, together with views of the different propoſed bridges, have been ſince publiſhed, and a propoſal made for a caſt-iron bridge of three arches, reſting on ſtone piers, the centre arch 65 feet high for the paſſage of ſhips; in September 1802, the city of London gave notices of their intention to apply for an act of parliament for removing London bridge and building another, but nothing further, we believe, has ſince been done. *Blackfriars Bridge* is an elegant ſtone ſtructure, offering ſcarcely the leaſt impediment to the navigation; it was built in 1770, by Mr. *Robert Milne*; the river in this place is 995 feet wide, it has 9 large elliptical arches, the centre one 100 feet wide, the others regularly diminiſhing to the outſide ones which are 70 feet each. The whole coſt of this bridge, in the 10¾ years during which it was in hand, was 150,840*l.* *Weſtminſter Bridge* was built of ſtone in the year 1750; the river in this place is 1220 feet wide; there are 17 large, and two ſmall ſemi-circular arches in this bridge, the centre one 76 feet wide, the others diminiſhing by 4 feet each in width, to the ſmall ones at the ſides; the coſt of this bridge and its avenues was 389,500l., and it was about 10 years in hand. At Batterſea and at Putney there are narrow, low, and inconvenient wooden bridges over this fine river. On the 4th of June 1783, a handſome and convenient ſtone bridge was begun over this river at Kew, and in the year 1774, another ſtone bridge was begun at Richmond. About the year 1801, a new ſtone bridge was built over this river at Staines, but it was ſhortly after obliged to be taken down, owing to a ſettlement therein; an iron bridge was next ſubſtituted, and opened on the 3d of September, 1803, of one arch, with 180 feet ſpan, riſing only 16 feet above the ſtone abutments on which it reſted; but this, we are ſorry to add, has lately ſuffered the fate of the other, and has neceſſarily been taken down, a circumſtance the more to be regretted, as this was the firſt caſt-iron bridge brought into uſe in this part of the kingdom. At Walton, there is a curious bridge, conſiſting of a large wooden opening, and ſmaller brick arches on each ſide of it. It may be proper to add, that the intention has very recently been announced, of building a new ſtone bridge over this river from Vauxhall to Millbank, with a new road over the ſame from Vauxhall turnpike acroſs Tothill fields to Pimlico. In the year 1770, and again in 1794, the *Maidenhead and Iſleworth* canal was propoſed to join this river at Iſleworth and at Bolter's Lock, or Taplow mill; in 1792, the *Hampton Gay and Iſleworth* was propoſed to join at the latter place; in 1801, the *Leatherhead and Thames* rail-way was propoſed to join this river at Weſt Moulſey, and an extenſion of the Grand Surry canal was intended to Kingſton; in 1802, a cut from the propoſed weſtern branch of the *Grand Junction* canal was propoſed to join at Ham Haw oppoſite to the *Wey* river; and, in 1803, the *Portſmouth and London* rail-way was propoſed, to terminate in Stamford ſtreet, near Blackfriars bridge.

THAMES AND ISIS NAVIGATION. Act 11, 15, 28, and 35 of Geo. III.—The general direction of this navigation is nearly N. W. by a very ſerpentine and crooked courſe of about 110 miles between the counties of Surrey and Berks, and of Bucks, Oxford, and Glouceſter: its weſtern end is conſiderably elevated; its objects are the ſupply of London and the carriage of coals, and a variety of other articles: near Reading it connects with the *Kennet* river; at Abingdon, the *Wilts and Berks* canal joins this navigation: at Badcock's garden in Oxford, this navigation is joined by the *Oxford* canal, and at Godſtow, by the *duke of Marlborough*'s cut from the ſame canal. Oxford is the 38th Britiſh town, with a population of 11,694 perſons, and Reading is the 55th, with 9,742 perſons; Staines, Windſor, Maidenhead, Great-Marlow, Henley, Wallingford, Abingdon, and Lechlade, are alſo conſiderable towns on this navigation, which commences in the *Thames* middle part at London-Stone near Staines, and terminates in the *Thames and Severn* canal at Lechlade. From Staines-ſtone to the water above Bolter's Lock, 15½ miles, is a riſe of 34 feet: thence to the entrance of the *Kennet* river 24½ miles, has a riſe of 27½ feet, beſides the riſe at the weirs; thence to the termination to the *Thames* and beginning of the *Iſis* river, is about 23 miles; thence to the *Wilts and Berks* canal about 10 miles; thence to the *Oxford* canal about 8 miles, and thence to Cricklade about 29 miles. The Gentlemen of the counties adjoining this navigation are Commiſſioners for executing, in different diſtricts, the above acts; they have borrowed 60,800l. and have expended the ſame, over and above the ſurplus of the tolls, in making 24 ſide-cuts with opening weirs and pound-locks, with a horſe towing-path, and other works for improving this navigation, which is now accompliſhed, ſo that very long and wide barges drawing 3 feet 10 inches, can in general paſs the ſame; the rate of tonnage is only ¼ per ton per mile; and an account of the receipts and expenditure on this concern is annually preſented to parliament. In 1796, the receipts amounted to 9,839l. in 1801, to 10,066l. in 1802, to 7,173l. Mr. *Zachary Allnutt* is engineer to the 2d and 3d diſtrict of this navigation. In the year 1800, Mr. *Wilſon* prepared a deſign and model for his Majeſty, of a caſt-iron bridge, of one arch, propoſed to be erected over the *Thames* at Datchet. In the year 1770, the *Reading and Maidenhead* canal was propoſed to join this navigation at Sunning, and at Bolter's lock; in 1802, a weſtern branch of the *Grand Junction* canal was propoſed to join this navigation at Harleyford near Great Marlow, and croſſing the ſame at that place, it was to proceed to join it again near Reading; and in the ſame year another branch from the *Grand Junction*, through Ayleſbury, was propoſed to join this navigation near to Abingdon, and to the *Wilts and Berks* canal.

*Thames and Avon Canal.* In the reign of Charles II., Mr. *Joſeph Moxon* was employed to ſurvey the line for a canal, and a bill was prepared and brought into parliament, from the *Thames and Iſis* navigation at Lechlade, by Cricklade, Malmſbury, Chippenham, and thence by the courſe of the *Avon* river to Bath, 40 miles in length: in 1754, this deſign was again revived, with the idea of employing the ſoldiers upon it; and it was ſtated that a canal 50 feet wide at top, 30 at bottom, and 4 feet deep, might thus be completed for 1000l. per mile.

THAMES AND MEDWAY CANAL. Act 40 and 44 of Geo. III.—The general direction of this canal is S.E. for 8½ miles in the county of Kent; it is level with the ordinary high tides in the river Thames: its object is for ſhortening the voyage of barges from Graveſend to Chatham round by the Nore; Chatham is the 46th Britiſh town, with a population of 10,505 perſons, and Rocheſter the 90th, with 6,817 perſons; Graveſend is alſo a conſiderable town near this canal, which commences in the *Thames* river at Graveſend, and terminates in the *Medway* river at Nicholſon's ſhip-yard in Friendſbury, with a cut from Whitewall on the line of this canal to the *Medway* at Strood, oppoſite to Chatham royal dock-yard. Tide-locks and entrance baſons are to be made at each of the three terminations of this canal; Mr. *Ralph Dodd* was the projector of this canal, on which Mr. *John Rennie* and Mr. *Ralph Walker* have ſince been employed. In December 1801, this canal was completed from Graveſend to Denton. The company were authoriſed to raiſe by the firſt act 60,000l. in 100l. ſhares, and a further ſum by the laſt act, and they are to pay 1s. annually to the city of London as conſervators of the *Thames* river, for the liberty of connecting therewith, and 1s. to the corporation of Rocheſter, as conſervators of the *Medway*, for the ſame privilege.

THAMES AND SEVERN CANAL. Act 23, 31, and 36 of Geo III.—The general direction of this canal is Eaſt, for 30½ miles in the counties of Glouceſter and Wilts: it croſſes the Grand Ridge by a tunnel; its objects are a communication between the Severn and Thames rivers, the ſupply of the country through which it paſſes with coals, deals, &c. and the export of farming products. Stroud is the 114th Britiſh town, with a population of 5,422 perſons; Minchinghampton, Cirenceſter, Cricklade, and Lechlade, are alſo conſiderable towns on or near to this canal; which commences

mences in the *Stroudwater* canal at Wallbridge near Stroud, and terminates in the *Thames and Iſis* navigation at Lechlade: it has a branch of about 1 mile in length to the town of Cirenceſter. From the *Stroudwater* canal to Sapperton or Salperton, $7\frac{3}{8}$ miles, is a riſe of 243 feet by 28 locks; thence, the ſummit pound continues through the Tunnel, $2\frac{3}{8}$ miles, to near Coates, and level; thence, to the *Thames and Iſis* navigation, $20\frac{3}{8}$ miles, is a fall of 134 feet by 14 locks. The firſt 4 miles of this canal from Stroud to Brinſcome-port Baſon, is of the ſame width and depth as the *Stroudwater* canal, and is navigated by the *Severn* boats; the remainder of the line is 42 feet wide at top, 30 at bottom, and 5 feet deep; at Brinſcombe-port, goods going eaſtward are removed into barges 80 feet long and 12 wide, which carry 70 tons each. The famous tunnel on this canal at Sapperton, is 4300 yards long, the arch being 15 feet wide in the clear, and 250 feet beneath the higheſt point of the hill, which proved to be hard rock, much of which required blaſting, and ſome of it was ſo ſolid as to need no arch of maſonry to ſupport it; the other parts are arched above, and have inverted arches in the bottom; the coſt of excavating this tunnel, in 1788, amounted to 8 guineas per cubic yard. The ſummit level of this canal is ſupplied by a feeder brought through lord Bathurſt's gardens. Mr. *Robert Whitworth* and Mr. *Joſeph Clowes*, were the engineers. On the 20th of April, 1789, the Sapperton tunnel was finiſhed, and on the 19th of November of the ſame year, the whole line was completed and opened. We are ſorry to have heard it remarked, that this canal has been conducted through porous gravelly ſoils, when a line for the ſame, equally convenient, might have made the cutting fall in a clay ſoil, and that puddling has been in too many inſtances neglected or has failed, by which the canal is rendered ſhort of water, and the land and mills have been greatly injured: fanciful round buildings like towers have been made in different places on this canal, for the reſidence of the lock-keepers. This company were authoriſed to raiſe 255,000l., the ſhares being 100l. each; there was a proviſion that 3 per cent. intereſt ſhould be paid (out of the principal) to the ſubſcribers on their ſhares, until the canal was completed and opened; we have heard that the preſent profits are not much above 1 per cent. No ſtamps were neceſſary to the proceedings of this company. The rates of tonnage and the regulations thereof with the *Stroudwater* company, are very long. See *Phillips*'s 4to. *Hiſtory*, pages 222 to 225. Manures for the adjoining lands are to paſs toll free: leſs than 6 tons not to paſs the locks without paying for that weight; $\frac{1}{2}$ mile-ſtones to be erected. In 1799, this company offered bounties for introducing the coals brought by their canal to the weſtern parts of Oxford and Berk ſhires. The *Glouceſter and Berkley* company are to compenſate this company, in caſe the conſtruction or repair of their works interrupts at any time the communication with the *Severn*. In September 1800, it was intended to make from near Ingleſham a forked branch paſſing Faringdon and Highworth, to connect with the *Wilts and Berks* canal in two places.

THANET'S CANAL. Act 13 Geo. III.—The direction of this canal is nearly N.E. for about $\frac{1}{2}$ of a mile in length, in the Weſt Riding of Yorkſhire; it is conſiderably elevated, near to Skipton, which is a conſiderable town; it commences in the *Leeds and Liverpool* canal, near Skipton, and terminates at Skipton-caſtle, lime-ſtone quarries. It was cut at the private expence of the *earl of Thanet*, through whoſe eſtate alone it paſſes, except one cloſe: its object is to convey coals to the lime-kilns, and to export lime as a manure and for building.

THYRN AND BURE NAVIGATION. The general direction of theſe rivers is about N.W. for nearly 30 miles in the county of Norfolk: they are not greatly elevated above the ſea in any part: the objects are the import of coals, deals, &c. and the export of farming products. Yarmouth is the 27th Britiſh town, with a population of 14,845 perſons; Ayleſham is alſo a conſiderable town on this navigation, which commences in the *Yare* river Yarmouth, and terminates at the town of Ayleſham: it has branches from near Thurne and Horning, through the fens and broads, to Hickling and Dilham, about 8 and 10 miles in length.

TIEV RIVER. This river, (ſometimes called the Tivey or Teifi river,) has nearly an eaſt courſe for about 39 miles, between the counties of Cardigan and Pembroke, and Caermarthen in South Wales: its eaſtern end is conſiderably elevated: its objects are the ſupply of Llanbedr and Cardigan, and the export of agricultural products. Cardigan, Kilgerran, Newcaſtle-in-Emlyn, and Llanbedr, are conſiderable town on this river, which commences in the tide-way in St. George's channel, and terminates at Llanbedr, or Lampeter.

TONE AND PARRET NAVIGATION. Acts 10 and 11 William III. 6 Anne, and 44 Geo. III.—The general direction of this navigation is nearly ſouth, by a bending courſe of about 27 miles in the county of Somerſet: its ſouthern end is conſiderably elevated: its objects are the import of coals, and the export of agricultural products; at Borough chapel it is joined by the *Parret* river. Taunton is the 106th Britiſh town, with a population of 5,794 perſons. Bridgewater is alſo a conſiderable town on this navigation, which commences in the tide-way in Brigewater-bay, at Start point, in the Briſtol channel, and terminates in the *Grand Weſtern* canal at the town of Taunton. In September 1798, a caſt iron bridge was completed, conſiſting of one arch of 75 feet ſpan over the *Parret* river at Bridgewater, at the expence of 4000l. (See our article BRIDGE). It was erected in the place of a ſtone bridge, ſaid to have been built about the year 1300. In 1796, the *Briſtol and Taunton* canal was propoſed to connect with this navigation at Bridgewater.

*Topcliff and Pierſe-Bridge.* In June 1801, it was propoſed to form a canal from the *Swale* river at Topcliff to Pierſe-bridge on the Tees river: the intention of this canal was for ſupplying the north riding of Yorkſhire with Durham coals.

TORRIDGE RIVER. The direction of this river is ſouth for three miles, near to the north-weſt coaſt of Devonſhire: the tide flows through its whole length: it commences in the *Taw* river near Appledore, and terminates at Biddeford bridge: its object are the ſupply of Biddeford, a conſiderable town, with coals, &c. and the export of agricultural products. The ſpring tides riſe 18 feet at Biddeford.

TOVEY RIVER. The direction of this river, (ſometimes called the Towey), is north, for about $8\frac{1}{2}$ miles, in Caermarthenſhire in South Wales: the tide flows through its whole length: its object is the ſupply of Caermarthen, which is the 113th Britiſh town, with a population of 5,548 perſons: it commences in the Briſtol channel, at St. Iſhmael's, and terminates at Caermarthen bridge. In September 1804, it was intended to apply for an act to improve the port, quays, and dock at Caermarthen.

TRENT RIVER, (*lower part*). Act 34 Geo. III.—The general direction of this navigation is nearly S.S.W. by a bending and crooked courſe of about 116 miles, ſkirting Yorkſhire for a ſhort diſtance, and through the counties of Lincoln and Nottingham, and between thoſe of Leiceſter and Derby: it is not greatly elevated in any part: its navigation is of vaſt importance to the country, owing to the many communications which it forms with other rivers or canals: at Keadby it connects with the *Stainsforth and Keadby* canal; at Stockwith, with the *Idle* river, and near the ſame place with the *Cheſterfield* canal; at Torkſey, with the *Foſs-dyke* canal; at Crankleys, in South-Muſkham, with the *Dean* river; at Trent-bridge, near Holme-pierpoint, with the *Grantham* canal, and the *Nottingham* canal; near Sawley, with the *Loughborough* navigation, or Soar river, and the *Erewaſh* canal. Nottingham is the 17th Britiſh town, with a population of 28,801 perſons; and Newark is the 91ſt, with 6,730 perſons. Burton-upon-Strather, Gainſborough, Newark, Southwell, and Bingham, are alſo conſiderable towns near this navigation; which commences in the *Humber* river at Trent-fall, (at the junction of *Ouſe* river, and *Market Weighton* canal,) and terminates in the Upper *Trent* river at Sawley-ferry, at the junction of *Derwent* river, and the *Trent and Merſey* canal. It has a ſide-cut of 10 miles in length, made in purſuance of the above act, for avoiding 21 ſhoals, and 2 bridges, which occur in 13 miles of the river between Trent bridge, at the commencement of the *Nottingham* canal, and Sawley ferry, at the commencement of the *Trent and Merſey* canal. This cut (ſometimes called *Trent Canal*), has a riſe of 28 feet, and it croſſes and connects with the *Erewaſh* canal near Sawley; it has alſo a ſhort cut and lock into the *Trent* in Beeſton. The lower part of this river is through fens, and is embanked on both ſides: it is ſubject to very great floods: the tide flows to Gainſborough, ſo that ſmall veſſels can come up to that place; but between this and Wilden-ferry, a great number of ſhallows occur, owing, in a great meaſure, to the too great width of the river: Mr. *John Smeaton*, who examined it in 1761, ſtates, that in ſeveral places in the common ſtate of the river, in dry ſeaſons, there was not above 8 inches depth of water; that at ſuch times, without the aid of fluſhes from King's mills upon this river, and the loweſt mills upon the *Derwent*, navigation was impracticable, The 33 of Geo. III. for *Grantham* canal required the proprietors of this navigation to deepen the bed of their river, ſo that there ſhall always be 30 inches deep of water in the drieſt ſeaſons for boats to paſs between the *Grantham* and the *Nottingham* canals, and by which they may alſo now paſs into the *Trent Canal*, for avoiding the ſhallows above Nottingham. An act was paſſed a few years ago for building a new bridge over this river at Gainſborough. In 1801 a new ſtone bridge was intended at Gunthorpe-ford. In the year 1789 and 1790, ſeveral acres of land were gained from the wide muddy banks of this river, ſimply by ſtaking down rows of furzen faggots thereon, to check the current, and encourage the abundant depoſit which this river makes, wherever its waters become ſtationary; (ſee *Agricultural Magazine*, vol. vii. p. 98.) a circumſtance which proves of immenſe advantage in many inſtances, by the warping of land near this river in floody times, to improve it. The flood which happened in the beginning of 1800, forced a new and much ſtraighter courſe for this river below Gainſborough, and occaſioned the old crooked channel to be deſerted. For making the new ſide-cut, or Trent canal, this company were authoriſed to raiſe 23,000l. in 50l. ſhares: and they are allowed to collect a variety of tolls on different parts of this cut and the river. See *Phillips*'s 4to. *Hiſtory*, *App.* pages 169 and 170. But theſe were not to take place until 13,000l. had been expended under the above act, which embraces the improvement of the river, ſo that there may be always 30 inches deep of water, the making of horſe towing-paths, purchaſing the Nottingham hauling-machine, or capſtern, &c. The profits of the Trent canal are not to exceed 7 per cent. By the 33 Geo. III. for *Derby* canal, only half the uſual rates are to be charged on goods paſſing only the [illegible] on this river, in their way to or from that canal: and by 33 Geo. III. for *Grantham* canal, this company are to receive [illegible] per ton for lime, and 3d. per ton for all other goods, (except road-materials and manures), which croſs this river, when deepened as above, between the *Grantham* and *Nottingham* canals. In 1766, the *Wilden and Kings-Bromley*, and in 1765, the *Ternbridge and Winsford* canals were propoſed to join this river at Wilden ferry, where the *Trent and Merſey* canal now joins.

TRENT RIVER, (*upper part*). Acts 10 and 11 William III.—The general direction of this navigation is nearly W.S.W. by a crooked courſe of about 19 miles, in Derbyſhire and Staffordſhire, and ſkirting Leiceſterſhire: it is not very greatly elevated above the ſea, in any part: its objects are the carriage of coals, and the export of ſalt, gypſum, earthen-ware, ale, and agricultural products: it connects at Swarkſtone with the *Derby* canal, and has the *Trent and Merſey* canal running the whole length almoſt by its ſide, and communicating with it at its two extremities. Burton-upon-Trent is the only conſiderable town on this navigation; which commences in the lower *Trent* navigation at Wilden Ferry (at the commencement of the *Derwent* river and *Trent and Merſey* canal,) and terminates near Burton, at a branch from the *Trent and Merſey* canal. The *earl of Uxbridge* is the ſole proprietor of this navigation, and all other perſons are reſtricted from erecting or uſing wharfs or warehouſes on its banks without his ſpecial conſent. The earl or his leſſees are entitled to 3d. per ton, on goods navigated on any part of this navigation; which was ſaid, in 1765, to be unimproved, except by the erection of locks at two different mill-weirs; and, more than 20 ſhallows then exiſted, over which boats could not paſs in dry ſeaſons, without fluſhes of water: ſtrange ſtories were at that time related of the conduct of theſe leſſees, and inſinuations were made, that a barge loaded with ſtones was ſunk by deſign in Kings-mill lock, and which lay there almoſt 9 years, and obliged all goods to be unloaded into freſh boats at that place! happily the rivalry of the canal by its ſide, renders ſuch an occurence hereafter unlikely ever to happen. The bridge over this river at Burton-upon-Trent is ſaid to be the longeſt in England, being 1545 feet long, with 34 arches. It may be proper here to remark, that Mr. *Smeaton*, in 1768, recommended the making of a long bridge or water-road adjoining the lower part of this river, between Muſkham and Newark, that ſhould have 300 yards long of clear water-way through its 72 arches! In 1793, the *Bredon* rail-way was propoſed to join this navigation at Weſton Cliff; in 1796, the *Commercial* canal, and in 1797, an extenſion of the *Aſhby-de-la-Zouch* canal was propoſed to connect herewith at Burton.

TRENT AND MERSEY CANAL. Acts 6, 10, 15, 16, 23, 25, *two of* 37, and 42 Geo. III.—This canal (ſometimes called the *Grand Trunk*, or the Staffordſhire canal,) has its general direction about E.S.E. by a very bending courſe of 93 miles in the counties of Cheſter, Stafford, and Derby: it croſſes the grand-ridge by a tunnel: its objects are the export of coals, ſalt, pottery-wares, lime, gypſum, Swithland-ſlates, agricultural products, &c. and forming parts of the grand inland communications between Liverpool and Mancheſter, with Hull, Briſtol, and London; at Quiton's-wood in Stoke, it connects with the *Newcaſtle-under-line* canal: at Great Haywood with the *Stafford and Worceſter* canal; at Fradley Heath with the detached part of *Coventry* canal; and at Swarkſtone it croſſes and connects with the *Derby* canal. Although none of the towns on this long canal appear to have ſo many as 5000 inhabitants, yet

Northwich, Middlewich, Sandbach, Newcaſtle-under-line, Stone, Stafford, Rudgley, Litchfield, and Burton-upon-Trent, on or near to the ſame, are conſiderable places. The commencement of this canal is in *Bridgewater*'s canal at Preſton-brook, and its termination in the *Trent* lower navigation, at Wilden-ferry near Shardlow, the point of junction of the *Trent* canal, or ſide-cut, the upper *Trent* navigation, and the *Derwent* river: from Etruria, a principal branch (ſometimes called the *Caldon Canal*,) proceeds by Froghall to Uttoxeter, by a very bending courſe of about 28 miles in length; from this, at Froghall in Kingſley, there is a rail-way branch of $3\frac{1}{4}$ miles to Caldon-low lime works, alſo from Stanley Moſs in Endon there is a canal branch of about $3\frac{1}{2}$ miles to the town of Leek, and from Shelton, a ſhort cut to Cobridge: from Stoke-upon-Trent there is a rail-way branch to Lane-end; and from Etruria another to Handley-green; from Longport to Dale-hall there is a canal-branch, and the ſame is continued forwards by a rail-way to the potteries at Burſlem; there is a cut 1 mile in length to the *Trent* river near Burton. Near Lane-delph, and in Harecaſtle there are ſhort cuts or tunnels, extending to the pits or ſeams of coals. From *Bridgewater*'s canal to Middlewich, 18 miles, is a level; thence to near Talk, 11 miles, is a riſe of 326 feet by 35 locks; thence along the ſummit-pound, and through Harecaſtle tunnel to the Caldon branch at Etruria, 6 miles, is level; thence to the *Stafford and Worceſter* canal at Great Haywood, 17 miles, is a fall of about 150 feet and 19 locks; thence to the *Coventry* canal at Fradley Heath, 13 miles, is about 32 feet, and 4 locks; thence to Horninglow wharf, 12 miles, is about 86 feet fall, and 11 locks; thence to the *Derby* canal at Swarktone, 10 miles, is about 16 feet fall, and 2 locks, and thence to the *Trent* river at Wilden-ferry, 6 miles, is a fall of about 32 feet, and 4 locks. From the ſummit level of the line at Etruria to near Bagnal on the Caldon branch, $5\frac{3}{4}$ miles, is a riſe of 75 feet, by 7 locks; thence to Stanley-Moſs, 1 mile, is level; thence to Froghall, $9\frac{3}{4}$ miles, is a fall of 61 feet, by 9 locks. From Preſton-brook to Middlewich, at the weſtern end, and from Wilden-Ferry to Horninglow near Burton, at the eaſtern end, the width of the canal at top is 31 feet, at bottom 18, and it is $5\frac{1}{2}$ feet deep; the locks here are 14 feet wide, adapted to river barges of 40 tons burthen; the middle part of the canal, and its branches, are 29 feet broad at top, 16 feet at bottom, and it is $4\frac{1}{2}$ feet deep, the locks being only 7 feet wide; the boats are 80 feet long, 6 feet wide, and carry 18 to 20 tons of lading. There are 16 public wharfs on this canal with warehouſes, cranes, weighing-engines, and other neceſſary conveniences at each. Over this canal there are 258 road and foot bridges, and under it 3 large aqueducts, and 124 leſſer ones and culverts. Through Harecaſtle Hill is a tunnel of 2888 yards in length, and upwards of 70 yards below the hill; this tunnel interſects, and has croſs branches to, ſeveral veins of coals in the hill, and is alſo famous for being the firſt public canal-tunnel conſtructed in England; the driving of this tunnel, in 1776, coſt about 70s. 8d. per yard run: the height of the arch is 12 feet, and its width 9 feet withinſide. At Preſton-on-the-hill near Bridgewater's canal is another tunnel of 1241 yards in length; at Barton in Great Budworth is another, 572 yards long; at Saltersford, or Saltersfield, in the ſame pariſh, is another of 350 yards long, and there is a fifth tunnel at Armitage, or Hermitage, of 130 yards in length; the heights of theſe laſt tunnels are $17\frac{1}{3}$, and their width $13\frac{1}{2}$ feet. At Monks-bridge there is an embankment 13 feet high of $1\frac{1}{4}$ mile in length, and an aqueduct bridge over the Dove river of 23 arches, from 15 to 12 feet wide each. At Alrewas is an aqueduct over the Trent river, with 6 arches of 21 feet ſpan; and near Middlewich is another aqueduct over the Dane, with 3 arches of 20 feet ſpan. In the Rudyerd vale, N.W. of Leek, near the grand-ridge, is a reſervoir of 160 acres extent, with an artificial head 30 feet in height; from this a feeder conducts its water to the Leek branch, and thence into the ſummit pounds of the Caldon branch, and of the main line: there are four ſmaller reſervoirs near the ſummit, which meaſure together 60 acres; all waters within 5 miles of the line are allowed for the uſe of this canal. The rail-way branch to Mr. *Gilbert*'s Caldon lime-works, made about the year 1777 or 1778, was compoſed of caſt-iron bars pinned down upon rails of wood fixed acroſs wooden ſleepers, as we have before deſcribed; it appears to have been ſet out, before the true principles of this excellent mode of conveyance were ſo well underſtood as at preſent, being very crooked and with frequent variations in the angle of its aſcent; in the laſt of the above acts, there is a proviſion made for varying the line of, and improving this rail-way. It is ſaid to have coſt, at firſt, about 1760l. per mile; in 1794, one horſe, we are told, for 9 months in the year, made in each week three journeys on four of the days, and two journeys on the other two days, hauling 3 tons 6 cwt. of limeſtone down each journey, from the quarries at Caldon to Froghall wharf; for forwarding this ſtone to the canal at Etruria, the company found boats, the bargeman found his own horſe and boy, towing lines, &c. and delivered the ſtone at 9d. per ton, the diſtance being about $16\frac{1}{2}$ miles. Mr. *James Brindley*, Mr. *John Smeaton*, and Mr. *Hugh Henſhall* were the engineers employed or conſulted on the works of this canal, which were begun in July 1766; in April, 1773, the line eaſtward of Harecaſtle tunnel was completed, and in May, 1777, the whole line was completed and opened: the Leek branch, the extenſion of the Caldon branch to Uttoxeter, and the Cobridge branch have been undertaken ſince the year 1797; the Lane-end, Handley-green, and Burſlem branches were projected in 1802. The firſt act above included 6 miles of the weſt end of *Bridgewater*'s canal, but with a power to aſſign or make over the ſame to the duke of Bridgewater, which was accordingly done; the 6th act above aſſigned 11 miles of the *Coventry* line, between Fradley-heath and Fazeley, to this company, who completed the ſame, and then ſold it in equal moieties to the *Coventry* and the *Birmingham and Fazeley* companies, as before mentioned. This company have been authoriſed at different times to raiſe 334,250l. the amount of their ſhares was 200l. each, until 42 Geo. III., when a diviſion of them was made into 100l. ſhares. The rates of tonnage are $1\frac{1}{2}$d. per ton per mile, with reaſonable wharfage after 24 hours, on all kinds of goods; but paving and road-materials (lime-ſtones excepted,) and manures paſs toll-free on the pounds and through the locks, when water runs waſte over their paddle-weirs. The act 33 Geo. III. for *Derby* Canal, granted ſome rates to this company on goods croſſing this canal or paſſing out of it into the *Trent* by the *Derby* canal; ſee *Phillips*'s 4to. *Hiſtory*, *Appendix*, p. 58 and 59. In the years 1760 and 1765, the *Wilden and Kings-Bromley*, and the *Tern-bridge and Windsford* canals were propoſed through parts of the tract now occupied by this canal: in 1793, the *Sandbach* canal was propoſed to join near that place, and the *Bredon rail-way* was intended to be connected herewith near Weſton-cliff: in 1796, the *Commercial* canal was propoſed, to croſs this canal at Horninglow near Burton, and again near Burſlem; in 1797, an extenſion of the *Aſhby-de-la-Zouch* canal, to join this at Horninglow was propoſed; the deſign of the two laſt propoſals was, an extenſion of the wide canals for 40 ton boats, and with the ſame view a plan was, in 1797, mentioned of widening this canal and its locks, bridges, &c. ſo that wide boats might paſs between Fradley-Heath, and the eaſt-end of Harecaſtle tunnel.

TWEED RIVER. This river ſeems to be navigable but about 1 mile from the ſea to Berwick bridge, between Berwick liberty and a detached part of Durham county. Berwick is the 82d Britiſh town with a population of 7,187 perſons; it has a great trade in ſalmon, which are caught in great quantities in this river, and 40,000 kits of it have been pickled and ſent off from this town in one year; 75 to 80 veſſels are employed in fiſhery, and the trade of this place connected therewith. At Berwick there is a ſtone bridge 947 feet long, with 15 arches over this river. At Kelſo ſeveral miles higher up on this river, a ſtone bridge was, in 1798, waſhed away, and a caſt-iron bridge was propoſed to be erected in its ſtead.

TYNE RIVER. Acts 9 and 10 Henry V., 6 and 7 William III., and 41 Geo. III.—The general direction of this river is nearly W.S.W. by a crooked courſe of about 14 miles between Durham and Northumberland; the tide flows through its whole length; its great object is the export of coals. Newcaſtle-upon-Tyne is the 10th Britiſh town with a population of 36,963 perſons, South Shields is the 65th with 8,108 perſons, and North Shields the 80th with 7,280 perſons; Gateſhead is alſo a conſiderable town near this river, which commences in the North Sea at Tynemouth, and terminates at Blaydon in Winlaton. A very peculiar kind of veſſels, as before mentioned, is in uſe upon this river for carrying coals from the waggon-roads, or rail-ways, and ſtaiths to the ſhips; theſe are called keels, and are limited (by 11 and 15 Geo. III.) to $25\frac{1}{2}$ tons of lading, or 8 Newcaſtle chaldrons of coals. From an humane ſet of Gentlemen reſident upon, and concerned in the trade of this river, originated the idea, and they offered a public reward for the *life-boat*, which Mr. *Greathead* brought to perfection, and firſt tried at the mouth of this river on the 30th of January 1790. (See the article LIFE-BOAT). The coals from the numerous coal-mines near this river were formerly delivered to the colliers or coal-ſhips lying below Newcaſtle bridge by means of the keels, but of late years ſeveral mines have been opened on both ſides of the river, and the rail-ways therefrom are conducted to ſtaiths or ſpouts on the quays, by which means the coals are ſhot at once into the holds of the ſhips. Wooden rail-ways were, ſince about the year 1680, in uſe between the mines and this river, ſome of them of conſiderable length, thoſe to Tanfield-Moor are 10 miles long. In April, 1798, an inclined-plane of 864 yards in length, was opened from Benwell, or Bywell collieries, as before mentioned: in October 1803, a rail-way from Mr. *Temple*'s Jarrow mine (128 fathoms deep) was opened to the river. No leſs than 35 ſorts of coals, or rather the produce of as many pits, are uſually ſhipped from this river for London, amounting to 700,000 chaldrons annually: ſee *Edington's Eſſay*, &c. p. 31. On ſome of theſe mines, immenſely large ſteam-engines are employed; in 1763, a new engine was erected at Walker colliery, with a cylinder 74 inches diameter and $10\frac{1}{2}$ feet long, which weighed $6\frac{1}{2}$ tons, and was calculated to lift 307cwt. of water by each ſtroke of its pump. There is an ancient ſtone bridge of 9 arches over this river, which was greatly damaged by a flood in 1771; in the year 1801, it was ſuggeſted to remove as many of its piers as would form a 144 feet opening near the ſouth bank, and to conſtruct an iron arch over the ſame, high enough for the keels to paſs without lowering their maſts. The conſervators of this river, in purſuance of the laſt of the above acts, have deepened and improved the ſame and its quays; in 1801, a new dry, or graving-dock, was opened at South Shields, capable of receiving ſhips at neap tides; in 1802, an act paſſed for building a new light-houſe at Tynemouth with reverberating lamps, inſtead of a coal fire blown by bellows, before uſed. In the year 1798, it was propoſed to make a tunnel or road-arch under the *Tyne* river from North to South Shields for the paſſage of carriages and paſſengers, and the expence thereof was eſtimated at 6,993l. In 1795, the *Newcaſtle and Carliſle* canal was propoſed to join this river near Newcaſtle; in 1796, the *Newcaſtle and Haydon bridge*, and in or before 1801, the *Newcaſtle and Maryport* were alſo propoſed. In 1797, and again in 1802, the *Durham and Cheſter-le-Street* canal was propoſed to join this river near Gateſhead; and in 1803, the *Tyne and Beamiſh* canal was propoſed through part of nearly the ſame tract.

*Tyne and Beamiſh Canal.* In 1803, it was propoſed to make a canal from the *Tyne* river, near Gateſhead, through Gateſhead, Wickham, Lameſley, and Birtly townſhips, to Beamiſh iron works and coal-mines.

ULVERSTONE CANAL. Act 33 Geo. III.—The direction of this ſhort, but large canal, is nearly N.W. for $1\frac{1}{4}$ mile in Lancaſhire; it is level with high-water at ordinary tides, with a ſea-lock at its entrance; its object is to admit ſhips to Ulverſtone town. This canal commences at Hammerſide hill in Morecambe bay in the Iriſh Sea, and terminates at the new baſon and wharfs at Ulverſtone; the canal is 65 feet wide at top, 30 feet at bottom, and 15 feet deep; the lock is 112 feet long; at the loweſt neap tides there is a depth of 9 feet water at the gates, and at ſpring tides of 20 feet; a public ſwing-bridge is built at Hammerſide. That able engineer, Mr. *John Rennie*, was employed on this canal, and completed it about July 1797. This company was authoriſed to raiſe 7,000l, the amount of their ſhares being 50l. each. Coals may be brought to this canal from the *Lancaſter* canal, without paying the ſea duty; ſome iron works have been eſtabliſhed near Ulverſtone ſince the opening of this canal.

*Uppingham Canal.* In 1793, it was propoſed to make a canal from the town of Uppingham in Rutlandſhire, to connect with the *Leiceſterſhire and Northamptonſhire Union* canal, and proviſion is made in its act (33 Geo. III.) for ſuch junctions.

USKE RIVER. The direction of this river is nearly N. for about 4 miles in the county of Monmouth; the tide flows through its whole length; its objects are the export of coals, iron, &c. and the trade of Newport; at Pill-Gwnelly it connects with the *Monmouthſhire* canal, and with the *Sirhowy* tram-road; it commences in the *Severn* river at Naſh, and terminates at Newport bridge.

*Wakefield and Hullet.* In September laſt (1805) notices were given for a rail-way from the *Calder and Hebble* navigation at Bottom boat in Wakefield, to Hullet-hall collieries, with branches to Birſtal and Smithic bridge in the weſt riding of Yorkſhire.

WARWICK AND BIRMINGHAM CANAL. Acts 33 and 36 of Geo. III.—The general direction of this canal is nearly N.W. for 25 miles in the counties of Warwick and Worceſter; it croſſes the grand-ridge without a tunnel; its objects are the ſupply of Warwick with coals, &c. and forming part of the moſt direct water communication between Birmingham and London; at Kingſwood in Rowington, this canal is joined by a branch from the *Stratford* canal. Birmingham is the 6th Britiſh town with 73,670 perſons, and Warwick is the 107th with 5,775 perſons, on the line of this canal; which commences in the *Warwick and Napton* canal in Budbrook pariſh near Warwick, and terminates in the Digbeth cut of the *Birmingham and Fazeley* canal at Digbeth near Birmingham; it has a cut of $\frac{1}{4}$ of a mile to the baſon at Saltesford in Warwick. From the *Warwick and Napton* canal, about ½ a mile, to near Budbrook town, is level; thence 2½ miles to Hatton, is a riſe of about 20 locks; thence to the Stratford branch, about 5 miles, is level; thence to Knowle common, about 4½ miles, is level; thence to Knowle-wharf, 1 mile, is a fall of about 7 locks; thence to near Deritend, about 10 miles, is level; thence to the Digbeth branch of *Birmingham and Fazeley*, 1½ mile, is a riſe of about 5 locks. At the termination at Digbeth a ſtop-lock is erected, which the *Birmingham and Fazeley* company may faſten up, whenever the water in this canal is of leſs depth than 4 feet at ſuch lock. At Haſeley there is a tunnel of 300 yards in length; at Henwood wharf there is an aqueduct over the Blythe river; near Flint Green another over the Cole river; and near its termination at Digbeth another over the Rea river. In May 1796, the northern end of the canal for near 9 miles to Henwood aqueduct was completed and opened; and, on the 19th of December 1799, the whole line was completed and opened. On the 30th of April 1799, a bank of this canal broke, it was ſaid, and the flow of the waters did ſome damage. This company was authoriſed to raiſe 180,000l., the amount of their ſhares is 100l. each. The rates of tonnage will be found in Mr. *John Cary's Inland Navigation*, pages 56 and 57; paving-ſtones, road-materials, and manures for adjoining lands (except lime), are to paſs free on the pounds, or through the locks when the water runs waſte. Huſbandry boats, not exceeding 5 feet wide, may be uſed by occupiers of lands; boats leſs than 70 feet long, or with leſs than 20 tons of lading, are not to paſs the locks without leave. The *Birmingham and Fazeley* company are allowed to take 6d. per ton on all goods which paſs from that canal to this, until they have paid off 3,600l. of their debt, after which they are to take only 5d.; they are alſo allowed 3d. per ton on all goods paſſing from this canal to that.

WARWICK AND NAPTON. Act 34 and 36 Geo. III.—The general direction of this canal, (at firſt called the Warwick and Braunſton,) is nearly Eaſt, for about 15 miles, in the county of Warwick: it is conſiderably elevated, and terminates near to the grand-ridge, on its Weſt ſide: its main object is, the opening of the moſt direct line between Birmingham and London. Warwick is the 107th Britiſh town, with 5,775 perſons; Southam is alſo a conſiderable town near to this canal; which commences in the *Warwick and Birmingham* canal, in Budbrook pariſh near to Warwick, and terminates in the *Oxford* canal at Napton on-the-hill; near Warwick it croſſes the Avon river, on an aqueduct bridge; near Radford and Long-Itchington there are ſmaller aqueducts. This canal is level with the *Warwick and Birmingham* canal at their junction, and is entitled to the waſte water from that canal. This canal was completed on the 19th of December 1799. The company were authoriſed to raiſe 130,000l.; the amount of each ſhare being 100l., but by the laſt act above, the holders of the original 1000 ſhares, were authoriſed to contribute any further ſum, and to be entitled to a proportionate dividend, with original ſhares, on ſuch addition. The tonnage rates are adapted to the principle, of making goods pay a higher rate for ſhort diſtances; ſee *John Cary's* Inland Navigation, pages 59 and 60: paving-ſtones, road-materials, and manures for the adjoining lands, (except lime,) are to paſs free on the pounds and through the locks when the water runs waſte thereat. Boats leſs than 70 feet long, or with leſs than 20 tons of lading, are not to paſs the locks without leave. The *Oxford* canal company are entitled to a variety of rates on goods paſſing out of this canal into that, which ſee in *Cary*, as above.

WAVENEY RIVER. The general direction of this river is nearly S.W. by a bending courſe of about 25 miles, between the counties of Suffolk and Norfolk: it is not greatly elevated in any part; its objects are the import of coals, deals, &c. and export of agricultural products: Yarmouth is the 28th Britiſh town, with a population of 14,845 perſons; Beccles and Bungay are alſo conſiderable towns, on or near this river; which commences in the *Yare* river at Burgh, and terminates at the town of Bungay.

WEAR RIVER. Act 34 Geo. II.—The general direction of this river is nearly S.W. for about 10 miles in the county of Durham; it is not greatly elevated in any part; its principal object is the export of coals. Sunderland is the 34th Britiſh town, with 12,412 inhabitants; Durham is the 74th, with 7,530 perſons; and Biſhops-Wearmouth is the 97th, with 6,126; Monks-Wearmouth and Cheſter-le-ſtreet are alſo conſiderable towns, on or near this river; which commences in the German ocean at Wearmouth near Sunderland, and terminates at Lumley caſtle. There is a rail-way of 7 miles in length from this river to Eaton-Main colliery, and a great number of others of conſiderable lengths, for conveying coals to the ſtaiths and ſpouts where barges and ſhips are loaded with them. Eighteen different ſorts of coals, or rather the produce of ſo many different pits, are uſually ſhipped from this river for the London market, amounting in the whole to 195,000 chaldrons annually; ſee *Edington's Eſſay on the Coal-trade*, page 31. In 1761, Mr. *John Smeaton* was conſulted, about the building of the firſt lock on this river near Harraton; the ſinking of its foundations being thought to endanger the coal-mines which were working *under* the river at that place, the river was then to be deepened and made navigable, from Briddick-ford to the new bridge, the eſtimate being 3700l. In the year 1802, a new dry or graving-dock was hewn out of the rock on the North ſide of the river in Monk-Wearmouth. On the 9th of Auguſt 1796, a grand iron bridge of one arch, 236 feet ſpan, and 100 feet high above high-water mark, was completed over this river at Wearmouth near Sunderland, as we have already mentioned in this article, and in our article BRIDGE. The importance of this bridge, beſides its advantage in admitting ſhips further up the river, will appear from the tolls for paſſing over it, having been let for the current year at 2080l. At the mouth of this river there are two piers for the improvement of Sunderland harbour; in 1802, a new light-houſe, 70 feet high, was built on the North pier, furniſhed with reflecting lamps: during tide-time every night, another light is exhibited below the principal one, as a notice to ſhips of the proper time to enter the harbour. In 1797, and again in 1802, the *Durham and Cheſter-le-ſtreet* canal was propoſed to join this river near Cheſter, and thence extend the navigation to Durham.

WEAVER RIVER. Acts 7 Geo. I. and 34 Geo. II.—The general direction of this river is nearly S.E. by a crooked courſe of 20 miles in Cheſhire: it is but little elevated in any part; its objects are the import of coals and Cumberland red iron-ore, and the export of ſalt and agricultural products: Frodſham, Northwich, and Middlewich, are conſiderable towns near this river; which commences in the *Merſey and Irwell* navigation, near Weſton, and terminates at Winsford bridge: the riſe is about 45¾ feet by 10 locks: the boats are from 50 to 100 tons burthen: the truſtees for this navigation were authoriſed to borrow money at 5 per cent. intereſt, and 1 per cent. for the riſk; in 1759, the debt amounted to 20,200l., borrowed at 5 and 4½ per cent.: this debt has long ago been paid off; and, there being no private intereſt in the concern, to the amount of 3000l. has been paid in ſome years, to the county treaſurer of Cheſhire, to be laid out in amending and repairing the public bridges, and in the repair of high-ways leading to the ſalt-works, agreeable to the directions of the firſt act. The ſalt-mines at Northwich are 300 feet deep. In 1804, it was in contemplation to make a ſide-cut to this river, from near Frodſham, into the *Merſey* at Weſton or Weſtern point, for avoiding the bar or ſhoal at the mouth of this river.

Welland River. Act 34 Geo. III.—The general direction of this river is nearly S.W. for about 37 miles in the county of Lincoln, and ſkirting the county of Northampton; it is not much elevated above the ſea in any part; its objects are the import of coals, deals, &c. the export of Ketton free-ſtone, Collyweſton white ſlates, agricultural products, &c.; near Crowland it connects with Catwater, a branch of the *Nen* river. Boſton is the 102d Britiſh town, with 5,926 inhabitants; Spalding, Crowland, Market-Deeping, and Stamford, are alſo towns of ſome note on this river; which anciently was navigable for conſiderable veſſels, from Foſſdike-waſh to Spalding; but owing to the conſtant changes, which have been taking place in theſe ſurpriſing fens, and their outfall into the waſh, we learn, that in 1618, there was not 6 inches' depth of water at low tide in the channel, 2 miles below Spalding; ſo that when the commiſſioners of ſewers inſpected the ſame, their boat was obliged to be carried in a cart upon the ſands for 3 or 4 miles below that town. In 1721, Mr. *Nathaniel Kinderly* (ſee his Ancient and Preſent State, &c. page 83) recommended the cutting of a new channel, from near the mouth of Glen river to Wyberton near Boſton, by which the outfall of this river would be into the channel of the *Witham* river, inſtead of Foſſdike waſh. The ſubſequent contractions of the *Welland* river, by embankments near its mouth, ſomewhat improved the navigation to Spalding, and delayed until the year 1794 the adoption of Mr. Kinderly's propoſed cut: in future the commencement of this navigation is to be in the tide-way of the *Witham* river at Wyberton roads, and it terminates at Stamford bridge. The new cut is to commence near the Ship alehouſe in Wyberton, where there is to be a ſea-ſluice againſt the *Witham*, for the river and flood waters, with gates pointing to ſea and to landwards; the threſhold of this ſluice is to be one foot below low water mark, and it is to be 50 feet wide in the clear; adjoining to the ſluice is to be a tide-lock, for the uſe of the navigation, 60 feet long, and 8 feet wide, in the clear. From this ſea-ſluice, the cut is to be continued weſtward, with a regular aſcent in its bottom, to 4 feet below the ſill of Vernat's ſluice, and is to terminate in the old *Welland* river, near Hooton's Gibbet: the width of the bottom of this new cut is to be 50 feet, and the ſides are to batter 2 feet for 1 in height; at the diſtance of 50 feet from the edge of this cut on the South ſide, and 30 on the North ſide, banks 11 feet in height are to be made, to retain the floods and prevent their overflowing the adjoining fens, a precaution which has been adopted through the whole courſe of the fens. Meſſrs. *John Hudſon*, *George Maxwell*, and *Edward Hare*, are appointed commiſſioners for ſetting out, and employing proper perſons to execute the new cut, ſluices, locks, &c. and are to cleanſe the channel of the *Welland* for ſome diſtance above the new cut, and erect a ſufficient dam acroſs the river below the entrance of the ſame, at Shepherd's hole, to ſtop the tide waters and turn the land waters through the new cut; the rates of tonnage for navigating of which, will be found in *Phillips*'s 4to. *Hiſtory*, *App.* page 179. A bridge is to be built over the new cut at Foſſdyke Inn: at Crowland, there is a moſt ancient and curious bridge on this river, ſpringing from three different abutments, and meeting in the middle. See our article Bridge. In 1797, it was ſtated that 10,000l. had been ſubſcribed for carrying the above new cut and improvements into effect; and we hope that ere long the ſame will be completed. Truſtees are appointed in the above act, for receiving the tolls and maintaining the works when completed by the commiſſioners. The greater part of the courſe of this navigation from Spalding to near Peakirk upwards, and from Market-Deeping to Stamford, is by modern cuts, on the north-weſt ſide of the old river, for avoiding its imperfect channel.

*Welſhpool and Leominſter.* About the year 1794, a canal was propoſed from the *Montgomery* canal and *Severn* river near Welſhpool, to the *Leominſter* canal at Woſerton; paſſing Biſhops-Caſtle and Ludlow in its courſe.

Wey River. The general direction of this river, is nearly S.S.W. for 20½ miles in the county of Surrey: it is not greatly elevated; its objects are the import of coals, deals, &c. and the export of chalk and agricultural products; at Weſtley near Weybridge, it is joined by the *Baſingſtoke* canal. Godalmin, Guilford, and Chertſey, are conſiderable towns on or near to this navigation; which commences in the *Thames* river at Ham-Haw near Weybridge, and terminates at the town of Godalmin. From the *Thames* to Guilford bridge, 15¼ miles, is a riſe of 86½ feet; in this part the channel of the river was very early improved by ſide-cuts, and pound-locks, (ſaid to be among the firſt erected in England, and to have been introduced by Sir *Richard Weſton*); from Guilford bridge to Godalmin, is a canal 5½ miles, with a riſe of 32½ feet; which is ſupplied by a feeder from the Wey at Godalmin. In 1791, and again in 1803, this navigation was propoſed to be joined near Godalmin by a canal from the *Itching* river, (ſee *Portſmouth and Croydon*). In 1800, the *Grand Surrey* was propoſed to be extended to this river near Weſtley; and in 1802, a branch from the *Grand Junction* canal was intended to connect with this river by means of the *Thames* at Ham-Haw.

Wharfe River. The general direction of this river is nearly N.W. for about 9 miles, between Ainſty Liberty and the Weſt Riding of Yorkſhire: it is not much elevated above the level of the ſea: its objects are the carriage of coals, free-ſtone, &c. and the export of agricultural productions. Tadcaſter and Cawood are conſiderable towns on or near to this river, which commences in the *Ouſe* river near Cawood, and terminates at the town of Tadcaſter.

Whitehaven Brook. This brook is navigable but a very ſhort diſtance, in a S.E. direction at its mouth, which is wide, conſtituting the harbour of Whitehaven in Cumberland: its chief object is the export of coals, lime, and free-ſtone. This harbour, ſituate on the Iriſh ſea, has had ſeveral acts paſſed for its improvement, viz. 7 and 10 Anne, 13 Geo. II., 1, 2, 28, 32, and 45 Geo. III. and in September laſt (1805) notices were given for a further application to parliament. Whitehaven is the 62d Britiſh town with 8,742 inhabitants. Mr. *John Smeaton* was conſulted in 1768, on the building of a north pier, and extending the ſouthern one within 200 feet of it. In 1796, a violent ſtorm happened, which conſiderably damaged the quays of this harbour. There are ſeveral rail-ways from this harbour, to the famous coal-mines in its vicinity. On the 4th of Auguſt 1738, the firſt rail or waggon-way was opened at this place, leading to Harrithwaite and Woodhouſe collieries. In 1802, the Henſingham lime-works were opened. On the 9th of Auguſt, 1803, the rail-way, 700 yards in length, paſſing over Branſty-arch, or Road-bridge, to Howgil and Whingill coal mines, were opened: and in the ſame year theſe to Brackenthwaite mine were opened. On 23d March laſt (1805) the William Pit, at 750 yards diſtance from the north wall of the harbour, was opened. Some of the veins of coals in theſe pits are 7½ to 12 feet thick, and from the whole of them 900 tons or upwards of coals are raiſed daily: one of theſe mines extends ⅔ of a mile under the ſea, at about 600 feet beneath its bottom; inclined planes, 200 fathoms long, being uſed, for drawing up boxes of coals and others of water, from the extremities of theſe workings under the Sea, to the bottoms of the ſhafts; theſe boxes are drawn up the planes by horſe gins; for which purpoſe, and dragging the coal-waggons to the ſhafts, 100 horſes are conſtantly employed under ground in theſe pits. The fire-damp often proves fatal to the men and horſes employed in theſe works. There is a fine white free-ſtone quarry on the weſt ſide of the harbour.

*Wibſey and Dewſbury.* In 1802, a rail-way was propoſed from the *Calder and Hebble* navigation at Ravensbridge in Dewſbury, to Low-moor iron-works in Wibſey, about 7 miles in length.

*Wilden and King's-Bromley.* In 1760, the line for a canal was ſurveyed by Mr. *James Brindley* and Mr. *John Smeaton*, from the *Trent* river at Wilden-ferry to King's-Bromley near Litchfield, 25 miles, with a riſe of 110 feet by 19 locks, with a branch therefrom to Longridge near Burſlem, 30¼ miles, with 166¾ feet riſe, by 28 locks; from which laſt a level branch was again propoſed of 3½ miles, to Newcaſtle-under-line: another branch of 2½ miles, to Litchfield mill-pool, 18 feet riſe, and 3 locks, and thence ½ a mile farther with 30 feet riſe, and 5 locks: another level branch was propoſed of 10 miles, to Fazeley near Tamworth, and thence ½ a mile, to the Tame river, 17 feet riſe, by 3 locks. This canal was intended to be 24 feet wide, and 2½ deep, with fords inſtead of bridges: the eſtimate was 100,200l. Mr. *Smeaton* ſuggeſted an extenſion of this canal, over Harecaſtle-hill, by deep-cutting, with reſervoirs and ſteam-engines, for ſupplying the ſummit. The *Trent and Merſey*, *Newcaſtle-under-line*, and *Coventry* canals have ſince accompliſhed what this ſcheme had in view.

WILTS AND BERKS CANAL. Acts 35 and 41 Geo. III.—The general direction of this canal is nearly N.E. by a bending courſe of about 52 miles, in the counties of Wilts and Berks: it croſſes the grand ridge at the foot of the chalk-hills without any tunnel: its objects are the import of coals from both its extremities, the export of farming products, &c. Abingdon, Wantage, Swindon, Wotton-Baſſet, Chippenham, Calne, Meikſham, and Trowbridge, are conſiderable towns on or near to this canal, which commences in the *Kennet and Avon* canal at Semington, and terminates in the *Thames and Iſis* navigation at Abingdon. It has a cut of about 1½ mile to Chippenham, one of about 3 miles to Calne, and another of about 1 mile to Wantage: the ſummit-level extends from near Wotten-Baſſet, to near the extremity of Wilts. The locks are calculated for long, narrow boats. On the Calne branch there is a ſhort tunnel, under the road at Cuningham park; and a principal aqueduct-bridge over Broadtown brook near Wotton-Baſſet. The riſe of the road over the canal bridges is nowhere to exceed 3 inches in a yard; the ſprings and ſtreams within 2000 yards may be taken; the uſe of inclined-planes inſtead of locks is provided for in the act; but they will not be neceſſary, the canal being generally cut through clayey ſoils that have plenty of water: half-mile ſtones are to be erected on the canal banks. The company have been authoriſed to raiſe 311,900l. the amount of ſhares being 100l. each. The inhabitants of Calne made an offer, in Auguſt 1799, we are told, to cut the branch to that town, on being allowed the tolls thereon for ſo doing. In Auguſt 1799, the weſtern end of the line was completed and filled, and on the 1ſt May 1801, by the completion of the *Kennet and Avon* to Semington, the junction was formed, and 22 miles of the line to the aqueduct near Wotten-Baſſet, with the Calne and Chippenham branches, have ſince been uſed, principally in bringing in Somerſetſhire coals. In September 1800, two branches of the *Thames and Severn* canal, by Faringdon and Highworth, were propoſed, to join this canal at Uffington and Shrivenham. In 1803, the Ayleſbury branch of the *Grand Junction* canal was propoſed to connect with this canal by means of the *Iſis* river at Abingdon.

*Winſton and Stockton.* In 1768, Mr. *James Brindley* and Mr. *Robert Whitworth* ſurveyed the line for a canal from the *Tees* river at Stockton in *Durham* county; paſſing Hartburn, Cothams-ſtob, Moor-houſe, Oak-tree, Maidendale, Bank-top, Darlington, Cockerton, Lower-Walworth, Legg's-croſs, Killerby, and Staindrop, to Winſton: with a branch 1¼ mile from Lower-Walworth to the Tees at Pierſebridge; another from Darlington, 3 miles to Croft-bridge on the Tees; and another from Cothams-ſtob, 2 miles to the Tees at Yarm. The riſe from Stockton to Winſton is 328 feet. A feeder was to be taken from the Tees river, 3 miles above Winſton. The export of coals, lime, and lead, was the object of this propoſed canal.

WISBEACH CANAL. Act 34 Geo. III.—The direction of this canal is nearly S.E. for 6 miles, in the counties of Cambridge and Norfolk; it is but very little higher than the ſea, being embanked through the level fens: its object is a communication between Wiſbeach and Lynn, inſtead of an old part of the *Nen* river near it, which is almoſt grown up. Wiſbeach is the only conſiderable town near this canal, which commences in the *Nen* river at the old ſluice in Wiſbeach, and terminates in the *Nen* river again at Outwell (at the commencement of Well-creek, a branch of that river leading to the great *Ouſe* river): it is ſtraight and level, having flood locks at its extremities. This company were authoriſed to raiſe 20,000l. the amount of each ſhare being 105l. All goods entering or paſſing out of this canal are to pay 3d. per ton, except government ſtores and baggage, road-materials, manures, and materials for the uſe of the Fen-Corporation: huſbandry boats may alſo be uſed toll free, but not paſs the locks. The commiſſioners for the *Nen* navigation are to have 100l. out of theſe tolls, and the remainder, after paying intereſt on the debt, is to be applied in the repair and improvement of Well-creek.

WITHAM (*old*) RIVER. Act Geo. II.—The general direction of this river is nearly N.W. for about 41 miles in the county of Lincoln; it is but little elevated above the ſea in any part: its objects are the import of coals, deals, &c., the export of farming products, and forming part of the inland communication between Lynn and Hull, Liverpool, Mancheſter, &c. Near Tatterſhall it is joined by the *Horncaſtle* navigation; at Chapel-hill by the *Sleaford* navigation; and at Wyberton roads the new outfall and navigation of the *Welland* river are to join this river. Lincoln is the 76th Britiſh town, with a population of 7,398 perſons, and Boſton is the 102d, with 5,926 perſons; Tatterſhall is alſo a conſiderable town near this river; which commences at the Scap or Scalp in the tide-way of Boſton deeps in the Waſh, and terminates in the *Foſſdyke* canal, or new navigation at Brayford Meer. This river below Boſton, about 4 miles, was anciently ſo deep, and was ſo much frequented by ſhips, that in the 6th year of king John, when the merchants of London paid only 836l. as a tax on their lands and goods, Boſton contributed 780l. A gradual decay and ſilting up of the channel and harbour took place to ſuch a degree, that when in 1761 Meſſrs. *John Grundy*, *Langley Edwards*, and *John Smeaton* examined the ſtate of this navigation, and of the drainage of the adjoining fens, through which this river is embanked on both ſides through nearly its whole length, owing to the long neglect of the banks, which ſhould have confined the returning tide and the land-waters, ſo as to ſcower the channel, they reported that 30 ton barges could then ſcarcely reach Boſton, while the navigation above that town was entirely loſt, and the ancient channel was in ſeveral places entirely grown up and abandoned by the water, in its ordinary ſtate. Mr. *Smeaton* then recommended the erection of a ſea-ſluice upon this river below Boſton, the ſill thereof as low as low-water, with 3 openings, amounting to 50 feet wide; theſe to be furniſhed with doors pointing to ſea-ward, and draw-gates behind them gauged, or having their tops, two feet below the ſurface of the ſens, for always retaining a proper quantity of water in the river in dry ſeaſons; alſo a ſea-lock at the ſame place for the navigation, furniſhed with three pair of gates, two of them pointing to the land and one to the ſea: the ſtraightening, enlarging, and deepening of the river above Boſton to 80 feet at top, 50 at bottom, and 10 feet deep, were recommended, and the erection of three pound-locks, furniſhed with flood-gates or opening-weirs adjoining, below Lincoln, and one other ſuch lock above. The eſtimate for ſuch of theſe works as related to draining, was 38,000l., and for the navigation works 7,370l. It was remarked that Lincoln high-bridge had but 15½ feet clear width of water-way, above which a hard gravelly place, probably an ancient ford, called Brayford head, covered frequently with only 3 feet of water, acted as a weir for holding up the waters of Brayford meer and the *Foſſdyke* canal. When Mr. *Smeaton* was afterwards conſulted in the year 1782, he objected to a navigation lock which had been in the interim erected below Lincoln town, and recommended the cutting off the communication between *Foſſdyke* canal and Brayford meer, by a pound-lock with gates pointing to the canal, and to deepen this river through and above Lincoln bridge, and to remove Brayford head, ſo as to lower the water in Brayford Meer: the principal wharfs appear to have been ſince made, and the trade of Lincoln is now carried on upon this meer or water. By the acts of 32 Geo. III. for *Horncaſtle* and *Sleaford* navigation, thoſe companies were required to contribute equally with this company in the expences of deepening and improving this river through Lincoln high-bridge, and thence to the *Foſſdyke* canal, in the next 7 years; in conſequence of which, goods paſſing on this river to or from the *Horncaſtle* or *Sleaford* navigations, are to pay only half the accuſtomed rates on this river. In 1803 it was in contemplation to further improve the navigation of this river below Lincoln. Much has been written on a prohibition ſaid to exiſt againſt the ſhipping of coals from this river, on account of its preventing a rivalry with Newcaſtle and Sunderland coals in the London market, by the produce of the Yorkſhire, Derby, and Nottingham mines being brought by the *Trent*, the *Foſſdyke*, and this navigation, to Boſton deeps; an expectation not much better founded, we fear, than that the opening of the *Stover* canal would have any effect on the London coal-market.

WORCESTER AND BIRMINGHAM CANAL. Acts 31, 38, and 44 of Geo. III.—The general direction of this canal is nearly N.E. for 29 miles in the counties of Worceſter and Warwick; it croſſes the grand-ridge by a tunnel: its objects are the export of coals, and a more direct communication between Birmingham and the *Severn* river: at Selly Oak it is joined by the *Dudley* canal, and at Kings Norton by the *Stratford* canal. Birmingham is the 6th Britiſh town, with a population of 73,670 perſons; Worceſter is the 40th, with 11,325 perſons; Bromſgrove and Droitwitch are alſo conſiderable towns near this canal; which commences in the *Severn* river at Diglis juſt below Worceſter, and terminates in the old *Birmingham*, and the *Birmingham and Fazeley* canals, at their junction at Farmers bridge at the upper end of the town of Birmingham. From the *Severn* to Tardebig, 15 miles, is a riſe of 428 feet by 71 locks; thence to the *Birmingham* canal, 14 miles, is level. The width of the canal at top is 42 feet, and the depth is 6 feet; the locks are 80 feet long and 15 feet wide; the boats are of 80 tons burthen. At Worceſter there is a very fine baſon for the canal boats. There are 4 or 5 principal, and ſeveral ſmaller culverts: the principal tunnel at Weſt Heath is 2700 yards long, 18 feet high, and 18½ feet wide within the arch, the depth of water therein is 7½ feet; at Tardebig is another of 500 yards in length; at Shortwood is another of 400 yards in length; at Oddingley one of 120 yards; and, at Edgbaſton another of 110 yards in length: four of theſe tunnels are upon the ſummit-pound. Near Coſton-Hacket there is an immenſe piece of deep cutting; in 1794, Mr. *Carne*'s machine worked by a horſe at length, was uſed for excavating the ſoil, inſtead of wheeling it out in barrows. Where the ſummit-pound of this canal connects with the *Birmingham*, the *Dudley*, and the *Stratford* canals; ſtop-locks are erected, which the ſeveral companies may ſhut and lock up, when the ſupplies of this or the other canals fail, ſo as to endanger the lowering of the ſummit-pound, to obſtruct the navigation. Mr. *John Smeaton* was one of the engineers to this canal, the ſcheme of which was laid, and a bill was brought into parliament in 1790, but the oppoſition of intereſts, and natural difficulties of this vaſt undertaking then proved fatal to it; the great anxiety and fatigue which Mr. *Smeaton* underwent in this arduous undertaking, are thought to have injured his health and to have ſhortened the days of that very able and excellent man. In May 1796, the eaſtern end of this canal, as far as the *Stratford* canal at Kings-Norton, was completed. The arching of the Weſt-heath tunnel was begun on the 28th of July 1794, the whole of it was turned by the 25th of February 1797, (1780 yards of it having been completed in the year 1796) and in March 1797, the navigation was extended through it to Hopwood wharf, and in the following year, the ſame was extended to the weſtern end of the ſummit-pound at Tardebig. The company were authoriſed by their two firſt acts to raiſe 399,929l. 1s. 1½d.: their whole ſhares being made hereby, of the odd value of 138l. 17s. 9d. each: theſe were ſaid to be depreciated in value almoſt to nothing; but in 1802, they had riſen to 40l. each. The laſt act was for raiſing a further ſum of money for completing the very difficult part of the line, and ſupplying lockage-water, by ſteam-engines to pump it up from the *Severn*, by reſervoirs, &c. which yet remains to be accompliſhed. The rates of tonnage owing to the ſeveral junctions with neighbouring canals are very complicated; ſee *Cary's Inland Navigation*, pages 68 to 70. Two-pence per ton is charged on goods entering the Worceſter baſon from the *Severn* river, to be there unloaded. This company guarantees the future profits of the *Droitwich* company to the extent of 5 per cent. annually on each ſhare, and thoſe of the *Stourbridge* company to 9l. per cent. on each ſhare: they are alſo to compenſate the water-bailiff of Worceſter for his dues on coals ſold on the *Severn* at Worceſter; they are alſo to pay to George Perrot eſq. as owner of the Stratford *Avon* navigation, 400l. per annum for loſs of his tolls on the upper part of that river by the making of this and the *Stratford* canal, beſides making up any deficiency there may hereafter be, in his rents of 1227l. for the tolls on the lower part of that river. About the year 1793, a branch was propoſed, it appears, from this canal near Hanbury-Hall to the *Droitwich* canal at that town.

WYE RIVER. The general direction of this rapid and romantic river is nearly N.W. by a very bending and crooked courſe of about 85 miles, in the counties of Monmouth and Hereford, and Brecknock, in South Wales, and ſkirting the county of Glouceſter: its northern end is conſiderably elevated: its objects are the carriage of coals, and the export of agricultural products; at Hereford it is approached very near, if not joined, by the *Hereford and Glouceſter* canal. Hereford is the 89th Britiſh town, with a population of 6,828 perſons: Chepſtow, Colford, Monmouth, Roſs, and Hay are alſo conſiderable towns on or near to this river; which commences in the *Severn* river at Beachley, and terminates at the town of Hay. The tide often riſes in the mouth of this river, to the extraordinary height of 40 feet; Chepſtow bridge over the ſame, is of great height above the water at low tide. In 1802, and again in 1804, it was in contemplation to make a horſe towing-path by the ſide of this river, and by deepening the ſhallows in ſeveral places to improve its navigation. In 1802, the *Dean-Foreſt* railway was propoſed to join this river at Engliſh-Bichnor, we believe; in the ſame year notices were given, for an intended rail-way from this river at Hereford, to join the ſame again oppoſite to Lydbrook; and in March laſt (1805) another railway was propoſed from this river to the *Monmouthſhire* canal.

WYRLEY AND ESSINGTON CANAL. Acts 32 and 34 Geo. III.—The general direction of this canal is nearly S.W. by a very crooked courſe of 23 miles in the county of Stafford: it is conſiderably elevated, and terminates at its weſtern end near, or upon the grand-ridge: its object is the export of coals, iron, and lime, which abound in its courſe: Wolverhampton is the 33d Britiſh town, with a population of 12,565 perſons; Litchfield and Walſall are alſo conſiderable towns on or near to this canal; which commences in the detached part of the *Coventry* canal at Huddlesford (near to Whittington brook, and the commencement of the *Birmingham and Fazeley* canal) and terminates in the old *Birmingham* canal near Wolverhampton: there is a branch of $5\frac{1}{2}$ miles to Hay-head lime-works; another of $2\frac{1}{2}$ miles to Lord's-Hay coal-pits; another of near 4 miles at Wyrley-bank collieries, with a branch from this laſt near 1 mile to Eſſington new collieries; there is alſo a branch $\frac{1}{2}$ a mile to near Walſall town, which terminates within $\frac{1}{2}$ a mile of the branch of the old *Birmingham* thereto. From the *Coventry* canal to near Cannock-Heath reſervoir, $7\frac{1}{2}$ miles, is a riſe of about 264 feet, by 30 locks; thence to the old *Birmingham* canal, $15\frac{1}{2}$ miles, is level; the Lords-Hay, Hay-head, and Walſall branches are all level with the long pound: the Wyrley branch riſes about 36 feet, by 6 locks, in the firſt $\frac{1}{2}$ mile, the remainder thereof is level, and therefrom the Eſſington branch riſes about 24 feet, by 4 locks. This canal is 28 feet wide at top, 16 at bottom, and $4\frac{1}{2}$ feet deep. No water is to be taken from the old *Birmingham* canal, but a lock is erected at the junction, and this canal is to be conſtantly kept 6 inches higher than that, or all boats are to be ſtopped, by a man ſtationed there for that purpoſe: the ſurplus water from this is to be vented into the old *Birmingham* canal. Litchfield water-works pipes were to be carefully guarded in cutting this canal. Branches of 5 miles in length may be made to this canal by the owners of the mines, if they waſte no water. Mr. *William Pitt* was the engineer: and the canal and works were long ago completed. The company were authoriſed to raiſe 160,000l. the firſt 35,000l. in 125l. ſhares; on the extenſion of the canal in 1794, the company were required to purchaſe the ſhares of certain diſcontented proprietors: the new ſhares are 100l. each. The rates of tonnage will be found in Mr. *John Cary's Inland Navigation*, p. 47 and 48. Leſs than 20 tons in a boat is not to paſs the locks without paying for that lading, except empty boats on their return. In 1792, it was propoſed to make a branch to Stow-heath, and two others into Aſhmore-park.

YARE RIVER. The direction of this river is nearly W. by a bending courſe of about 22 miles, in the county of Norfolk: it is not much elevated in any part; its objects are the import of coals, deals, &c. and the export of agricultural products: at Yarmouth this river is joined by the *Thyrn* river, and at Burgh by *Waveney* river. Norwich is the 11th Britiſh town, with a population of 36,854 perſons, and Yarmouth is the 28th, with 14,845 perſons; there are no other conſiderable towns near this river; which commences in the German Ocean at Gorleſton-fort, and terminates at the water-works and mill in Norwich: at Yarmouth there is a draw-bridge for admitting maſted veſſels above it. The quay of this port is $1\frac{1}{3}$ mile in length, and in ſome parts 150 yards in breadth: a curious kind of low carriages called Yarmouth-Carts are uſed for conveying the goods from the quay to the warehouſes. In 1804, St. Michael's Coſlany bridge over this river in Norwich city was taken down, and a caſt-iron bridge erected by Mr. *Froſt* in its ſtead. In 1785, and again in 1802, the *London Lynn and Norwich*, or North London canal, was propoſed to join this river at Norwich.

YORE RIVER. Act 7 Geo. III.—This river, ſometimes called the Ure river, has nearly a N.W. direction for about $8\frac{1}{2}$ miles in the Weſt, and ſkirting the North Riding of Yorkſhire: its objects are the ſupply of Borough-bridge and Ripon, and the export of agricultural products: at Myton it is joined by the *Swale* river. This navigation commences in the *Ouſe* river at Linton, and terminates in the *Ripon* canal at Milby. From the *Ouſe* to the *Ripon* canal, is a riſe of 11 feet; at Linton river is a lock, and a dam or weir ſo made up as to allow about 1 inch per mile in this diſtance, for a ſtream navigation. Mr. *John Smith* was the engineer, who in 1767 referred to Mr. *John Smeaton* for his opinion on the height of Linton dam, and other matters relating to the works then going on.

For further illuſtrating this part of our ſubject, we intend to give a map of the Britiſh iſlands, ſufficiently large to diſtinguiſh all the navigable rivers, canals, rail-ways, harbours, &c.; and having adopted a method, by which the inconveniences of large folding-maps will be avoided, and yet perfect facility be given, of reference from any page of the map to the other, this will probably be the firſt of a ſeries of maps, for deſcribing more particularly than has yet been done, ſeveral uſeful and curious particulars relating to the topography and preſent ſtate of our own country.

CANAL, *Canalis*, in *Anatomy*, is a term applied to ſeveral tubular cavities in the bones, and the ſoft parts of the body.

CANAL *of the lower jaw*, a conſiderable excavation under the ſockets of the teeth, in which the nutrient veſſels and nerve of the teeth are lodged. See SKELETON.

CANAL *of Fontana*, a ſmall channel in the ligamentum ciliare, between the ſclerotic and choroid coats of the eye. See EYE, *Anatomy of*.

CANAL *of Petit*, *Canalis Petitianus*, is formed in the anterior part of the membrana hyaloidea, round the margin of the cryſtalline lens. See EYE, *Anatomy of*.

CANAL *of the vertebræ*, a large tube, containing the medulla ſpinalis, formed in the poſterior part of the vertebræ; and extending from the occiput to the ſacrum. See SKELETON.

CANAL, in *Architecture*, is applied to the furrows on the face of, or underneath a larmier, ſometimes alſo called porticos; and fitted up with reeds or flowers; ſometimes to thoſe cavities, ſtraight or winding, made on the caulicoles of a capital. See SOFFITA.

CANALS are alſo uſed for the flutings of a column or pilaſter.

CANAL *of the volute*, in the Ionic capital, is the face of the circumvolutions, incloſed by a liſtel.

CANALE, in *Geography*, the chief town of a canton of the ſame name in the department of Gole, or iſland of Corſica, and diſtrict of Baſtia, containing 1087 inhabitants.

CANALES, in *Ancient Geography*, a place of Italy, in that part of Magna Græcia called Meſſapia, 30 miles from Lapatia, near the gulf of Tarentum. Anton. Itin.

CANALICIUM *aurum*, or CANALIENSE, that gold which is dug out of mines, or veins under ground.

CANALICULATA, in *Conchology*, a ſpecies of BULLA, deſcribed by Linnæus, the ſhell of which is cylindrical, and the whorls of the ſpire grooved. Obſ. This is browniſh or teſtaceous, clouded with a paler colour. Native place unknown.

CANALICULATA, in *Entomology*, an African ſpecies of BUPRESTIS, of a duſky colour, with entire wing-caſes; abdomen grooved beneath; tail armed with four teeth. Fabricius.

CANALICULATE *leaf* and *ſtalk*, in *Botany*. See LEAF and STALK.

CANALICULATUM, in *Conchology*, a ſpecies of BUCCINUM, the ſhell of which is ſpotted, and the whorls of the ſpire canaliculated. Argenville, &c. The ſpire conſiſts of 17 whorls. Its native place is unknown.

CANALICULATUS, a ſpecies of TURBO found in India. This ſhell is ſulcated, and tranſverſely ſtriated; colour white, varied with green, and ſometimes cheſnut; whorls of the ſpire ſix, and very convex. Chemnitz, &c.

CANALICULATUS, in *Entomology*, a ſpecies of CERAMBYX (*Prionus*) found in the Weſt Indies, but rarely. The thorax is crenated at the margin; dorſal groove villoſe and white; antennæ ſhort. Fabr. This intereſting ſpecies is deſcribed by Fabricius from a ſpecimen in the muſeum of Dr. Hunter; another occurs in the cabinet of Mr. Donovan.

CANALICUM, in *Ancient Geography*, a place of Italy in the Aurelian Way, in the paſſage from Rome to Arelatum by the Maritime Alps, 12 miles from Vada Sabbatia; (Anton. Itin.) it is alſo called *Canalium*, and is marked in the map of M. d'Anville in Liguria, towards the N.W. of Savo.

CANALIS, in *Entomology*, a ſpecies of BRUCHUS, of a ſmall ſize, that inhabits India. The colour is ſomewhat ferruginous; wing-caſes black at the tip; tail black; central line white. Fabricius.

CANALIS is uſed by *Surgeons* for an oblong, concave inſtrument, in which to put a broken limb, leg, or thigh. It is made either of braſs, wood, or earthen ware, ſometimes even of ſtraw fitted with linen cloth.

CANALIS *arterioſus*, in *Anatomy*, the veſſel which joins the trunks of the pulmonary artery and the aorta in the fœtus. See FŒTUS.

CANALIS *carotideus*, a canal in the petrous portion of the temporal bone, through which the internal carotid artery enters the cavity of the cranium, and a ſmall nerve paſſes from the ſixth pair to the ſuperior cervical ganglion of the great ſympathetic nerve. For the deſcription of this canal, ſee SKELETON.

CANALIS *medius*, the canal of communication between the third and fourth ventricles of the brain. See BRAIN, *deſcription of*.

CANALIS *naſalis*, the tube which conveys the tears from the lacrymal bag into the noſe. See EYE, *Anatomy of*.

CANALIS *uteri*. See VAGINA.

CANALIS *venoſus*, a branch of the umbilical vein, which terminates in one of the hepatic veins in the fœtus. See FŒTUS.

CANALIS *Trajanus*, and CANALIS *Ptolemæus*. See CANAL, *ſupra*.

CANALS, *ſemicircular*, of the petrous portion of the temporal bone. See EAR.

CANALUVII MONTES, in *Ancient Geography*, mountains of Macedonia, ſo called by Ptolemy, and ſuppoſed to be the ſame with the *Candavii* of Livy, and the *Candavii montes* of Pliny and Strabo; ſituate in the country called *Candavia*.

CANANDAQUA, in *Geography*, a poſt town, lake, and creek of America, in Ontario county and ſtate of New York. It is the ſhire town of the county, ſeated on the north end of the lake of the ſame name, at its outlet into Canadaqua creek. The lake is about 20 miles long and , broad, and conveys its waters in a N.E. and E. courſe, 35 miles, to Seneca river. This is the ſeite of an ancient Indian town of the ſame name, and ſtands on the road from Albany to Niagara, 16 miles W. of Geneva, and 235 miles N.W. from the city of New York. It is now in a flouriſhing ſtate. By the ſtate cenſus of 1796, there appeared to have been 291 electors in this townſhip.

CANANEA, a ſmall oblong iſland of Brazil in South America, belonging to the Portugueſe, oppoſite to the mouth of Ararapiza river; on the ſouth of which ſtands the town of Cananea, guarding the entrance of the bay. The iſland lies about 37 leagues from St. Vincent. S. lat. 25° 10′. W. long. 47° 12′.

CANANGA, in *Botany*, Juſſieu p. 284. Aubl. Guian. tab. 244. Claſs and order, *polyandria polygynia*. Nat. Ord. *Anonæ*, Juſſ. Eſſ. Ch. Petals ſmall, germs numerous, capſules or berries egg-ſhaped, peduncled, one-ſeeded. Juſſieu obſerves, that the plant for which Aublet formed this genus, is probably a congener of Sonnerat's uvaria longifolia; Ind. 2. p. 233. tab. 131. and alſo of Aublet's own genus Aberemoa, whoſe large berries have ſhort partial peduncles. La Marck has united Aublet's Cananga to the Linnæan genus uvaria, which he calls in French Cananga, (ſee UVARIA *Monoſperma*) and has of courſe alſo admitted Sonnerat's uvaria longifolia. Aublet's Aberemoa, which was accidentally omitted in its proper place in this work, is conſidered by La Marck as a diſtinct genus nearly allied to uvaria, but not yet fully deſcribed, having been ſeen by Aublet only in fruit. The fruit of Aberemoa is ſaid by Aublet to conſiſt of a roundiſh head of dry, egg-ſhaped, one-celled, one-ſeeded berries, ſupported by a common peduncle two or three inches long. It is produced by a tree which is a native of Guiana, the bark of which is blackiſh; the wood white and hard; and the leaves alternate, ſimple, about a foot and half long, and five or ſix inches broad, lanceolate egg-ſhaped, acuminate, rather thick, firm, pubeſcent, entire.

CANANI, in *Biography*. See CANANUS.

CANANO, in *Geography*, a town of Naples, in the province of Calabria Ultra; 2 miles S.S.E. of Reggio.

CANANOR, a ſea-port town of Hindooſtan, on the weſtern coaſt of Malabar. It was taken poſſeſſion of by the Portugueſe towards the cloſe of the 15th century; and about the year 1506, Almeyda, the firſt Portugueſe viceroy of India, obtained conſent of the king of the country to build a fort, and to ſecure it with a garriſon. From that time it became a large and populous city, inhabited chiefly by Mahometans, and carrying on a very conſiderable trade. In the year 1663, it was taken by the Dutch, who, conſidering the convenience and importance of its ſituation, eſtabliſhed a factory there. The adjoining country ſupplied abundance of rice, ſugar, pepper, and other valuable commodities; ſo that no leſs than 200 ſhips arrived annually in this port. However, the Dutch ſold it in the year 1770 to the ſultan of Anchediva or Angeoliva, for the ſum of 100,000 rupees. It was taken by the Engliſh, under general Abercrombie, on the 17th of December, 1790. Cananor is diſtant 15 miles N.E. from Tellicherry, and 100 W.S.W. from Seringapatam. N. lat. 11° 55′. E. long. 75° 14′.

CANANUS, John Baptist, in *Biography*, one of the reſtorers and improvers of anatomy, was born at Ferrara, in Italy, in the year 1515, where he acquired ſo much reputation for his ſkill in medicine, that he was invited to Rome by pope Julius III., who made him archiator, and his principal phyſician. On the death of the pope he returned to Ferrara, and purſued his anatomical reſearches. He firſt diſcovered the valves of the veins, which were afterwards more completely deſcribed by Veſalius. The work by which he is known, of which only four complete copies are ſaid to be in exiſtence, is "Muſculorum humani corporis picturata diſſectio," 4to. printed, Haller thinks, in 1543, no date, or place named. The figures, 27 in number, are neatly engraved on copper. They repreſent the muſcles of the upper extremities. In the preface, he promiſes a continuation of the work, which he probably did not finiſh. He died in 1579. Douglas. Bibliog. Haller. Bib. Anat.

CANAPE, John, phyſician to Francis I., in 1542, and public reader in ſurgery to the barbers ſurgeons company at Lyons, publiſhed in 1538, "Le Guidon pour les Barbiers, et les Chirurgiens," 12mo. Lyons. It was much eſteemed in its time, and was ſeveral times reprinted. L'Anatomie des os du corps humain, de Gelian, 1541, Lyons. He alſo tranſlated two of the books of Galen on ſimple medicines, and publiſhed a collection of treatiſes, on different branches of medicine, 1552. Eloy. Dict. Hiſt. Haller. Bib. Anat.

CANAPLES, in *Geography*, a town of France, in the department of the Somme; 10 miles N. of Amiens.

CANARA, a country of Hindooſtan, belonging to the kingdom of Myſore, about 60 leagues in length along the coaſt of the Indian Sea, and from 10 to 30 broad. Its principal places are Mangalore, Barcelore, Onore, and Carwar, which ſee reſpectively. This diſtrict is one of the acquiſitions gained from Tippoo Sultan in 1799. Canara has a peculiar dialect, which extends as far as Goa.

CANAR-ATAN, or *Great Canar*, a village dependent on the city of Cuenca, under the juriſdiction of the province of Quito, in Peru. It is remarkable for the riches contained in the adjacent mountains.

CANARD, in *Ornithology*, among the French, has the ſame application as duck with us, and anas amongſt Latin writers: vide Buffon, and others. In the common phraſeology of France, it literally implies the domeſticated duck.

CANARDER, Fr. is a term of reproach, when applied to a hautbois player; implying, when his reed fails, that he quacks and cackles like a duck.

Canarder, in *Military Language*, denotes to ſhoot, fire, diſcharge, or throw any thing at or on an enemy with advantage, or from a covered, ſecure, and advantageous ſituation, as out of a ſmall turret, guerite, or centry-box, from behind a hedge, dike, or fence, between pickets or paliſades, from walls with embraſures or loop-holes, &c.

CANARDIERE, a ſmall turret, guerite, or centry-box, ſometimes made of wood, and ſometimes of ſtone. Such boxes, or guerites, are occaſionally erected or placed at the ſalient angles of works as places of ſhelter for centinels, and for them to ſee from under cover. They uſed formerly to be conſtructed on caſtles for people to ſhoot, fire, diſcharge, or throw any thing from, unſeen, in unmoleſted ſecurity.

CANARIA, in *Ancient Geography*. See Canary.

Canaria, in *Ornithology*, a ſpecies of Fringilla, familiar to every one by the title of *Canary finch*, or *Canary bird*. The ſpecies is thus defined: bill and body yellowiſh white, with the quill and tail feathers greeniſh. Linn. Fn. Suec. &c.

The canary bird in a ſtate of nature is of a plain grey colour, with the down at the baſe of the feathers black, or blackiſh; the tail is ſomewhat forked, and the legs pale. They inhabit chiefly the Canary iſlands, but are alſo found in other contiguous places. Forſter obſerved them at Cape Verd, Fayal, and Madeira, where they are ſaid to frequent watery places, abounding moſt among the ſedges on the banks of rivulets.

M. Adanſon remarks that the canary bird, which becomes white in France, is at Teneriſſe almoſt as grey as a linnet; a change he ſuppoſes to ariſe from the coldneſs of the climate. The colour is alſo ſuſceptible of conſiderable variation from the diverſity of its food, from captivity, and eſpecially from the intermixtures with other ſpecies. So early as the commencement of the laſt century, Buffon obſerves, that bird-fanciers reckoned in the ſingle ſpecies of canary bird no leſs than nine and twenty varieties, every one of which was ſo diſtinct from each other as to be eaſily pointed out.

It may not prove altogether unintereſting in this place to enumerate the principal varieties of this fancy-bird in the natural order through which they may be traced, beginning with thoſe which approach neareſt to the primitive ſpecies.

Common canary finch, of a grey colour with the down black, as in the wild bird found in the Canary iſlands.

Grey canary finch, with the down and feet white.

Grey canary finch, with white tail.

Common flaxen canary finch.

Flaxen canary finch, with red eyes.

Flaxen canary finch, with plumage gloſſed with a golden hue.

Flaxen canary finch, with the down fair, or unmixed with black.

Flaxen canary finch, with white tail.

Common yellow canary finch.

Yellow canary finch, with the down yellow and unmixed with black.

Yellow canary finch, with a white tail.

Common agate coloured canary finch.

Agate coloured canary finch, with red eyes.

Agate coloured canary finch, with white tail.

Agate coloured canary finch, with the down of the ſame colour.

Common yellow-dun coloured canary finch.

Yellow-dun coloured canary finch, with red eyes.

Yellow-dun coloured canary finch, with plumage gloſſed with a golden hue.

Yellow-dun coloured canary finch, with down of the ſame colour.

White canary finch, with red eyes.

Common variegated or ſpangled canary finch.

Variegated canary finch with red eyes.

Canary finch, variegated with fair or flaxen colour.

Canary finch, variegated with flaxen colour, and having red eyes.

Canary finch, variegated with black.

Canary finch, variegated with black and fine yellow, and having red eyes.

Canary finch, regularly ſpangled with black and fine yellow.

Creſted canary finch.

Canary finch entirely of a full yellow.

Canary finch of a yellow colour, mixed with browniſh grey or greeniſh; which laſt, Dr. Latham obſerves, he has frequently ſeen in Chineſe drawings, but whether they were caged birds or not he was unable to aſcertain.

The above-mentioned kinds of canary birds are again ſubdivided into an amazing number of varieties, ſome of which are remarkable for beauty, and others are no leſs eſteemed for rarity, or melody of ſong. All theſe may, however, be comprehended under two general heads, the variegated kinds, and thoſe with the plumage plain; or, as it ſeems they are denominated in London by bird-fanciers, the *ſpangled*

*gled* and the *gay birds.* Writers obſerve that the white canary finches are never variegated, neither are the citron coloured; but when the latter have attained the age of four or five years, the extremities of the wings and tail become white. The grey are not of an uniform colour, for there are feathers more or leſs grey intermixed in their plumage, and in many of thoſe birds the grey is lighter or darker, and more or leſs inclining to brown or black. The agates are of an uniform colour in general, but liable to vary in the intenſity of their hues. Thoſe inclining to a cream colour are ſtill more uniform; the yellow is conſtant both in the ſame bird, and in different individuals. In the variegated or ſpangled birds thoſe that are of a jonquil yellow are tinged with black, and there is generally a ſpot of black on the head. There are variegated individuals with all the ſimple colours above-mentioned, but thoſe of the jonquil colour are ſuch as are more commonly variegated with black.

Theſe varieties are not the ſpontaneous offspring of the common canary finch; but of that bird croſſed with the *Venturon,* and *Cini,* or Serin, two ſpecies very nearly allied to the canary finch, and both which inhabit the ſouth of Europe. It is by this means, as well as by pairing the canary finch with the goldfinch, linnet, yellow-hammer, chaffinch, and even the domeſtic ſparrow, that ſo many varieties are produced. The canary bird proves fertile with the ſiſkin and goldfinch, but in this caſe the produce for the moſt part proves ſterile: the pairs ſucceed beſt when the hen bird is the canary, and the cock is of the oppoſite ſpecies. Indeed it has been remarked that the male canary bird will not aſſimilate with the females of any of the before-mentioned ſpecies, and that the croſs breed can only be procured by means of the hen canary. The two birds with which the canary intermingles its breed the beſt, as already ſtated, are the Serin, or *Fringilla Serinus,* and Venturon or Citril, *Fringilla Citrinella.* The ſerin is a bird of ſmall ſize, being rather leſs than the common linnet. Its upper mandible is brown, the under, whitiſh: the plumage above, brown, mixed with yellowiſh green; beneath, greeniſh yellow, and having the ſides marked with longitudinal ſpots of brown: the wings are marked with a greeniſh band: quills and tail brown, edged with greeniſh grey, and the legs brown. This kind is found not only in Italy, but in Greece, in Turkey, Auſtria, Provence, Languedoc, Catalonia, and probably in all the climates of that temperature. There are, however, certain years in which it is very rare, even in the ſouthern provinces of France. Its ſong is agreeable and varied, but the ſong of the female is inferior to that of the male. The citril finch is larger than the venturon, and has a louder note; it is indeed remarkable for the brightneſs of its colour, and for the ſtrength and variety of ſong. The female is ſomewhat larger than the male, has leſs of the yellow in its plumage, and does not ſing ſo well, or rather anſwers him, as it were, by monoſyllables. It is found in Provence, Dauphiny, Geneva, Switzerland, Germany, Italy, and Spain. In Burgundy it is known by the name of the canary. The plumage on the upper parts is of a yellowiſh green, ſpotted, or variegated with brown; beneath greeniſh yellow: wings duſky and greeniſh, and the legs fleſh colour. We conceive it right to be thus particular in pointing out the characters of the two latter birds, ſince they have been moſt commonly confounded as varieties of the canary finch, which alone is found in the Canary iſlands; and from which they differ ſpecifically, although in general appearance and manners of life they nearly aſſimilate. It is with thoſe two primitive ſpecies that the canary bird is commonly croſſed with moſt ſucceſs, and from the union of which many of the more eſteemed varieties of the common canary bird are produced. They are reared chiefly by the Germans and Italians, both of whom are celebrated for their ſkill in improving the natural notes of the canary bird by tuition. Moſt of the canary birds, we are told, that are imported from the Tyrol, have been brought up by parents, the progenitors of which were inſtructed by the nightingale. Our Engliſh canary birds have commonly more of the tit-lark note. The principal place for breeding canary birds is Inſpruck and its environs, from whence they are ſent to the Levant, and every part of Europe.

Canary birds are bred in large quantities, both for ſale and amuſement, in England, as well as in Germany, France, and other countries; and in each of theſe countries they have, by beſtowing due attention to the ſubject, very much improved the breed beyond thoſe imported from the Canaries. They are of different colours, yellow, white, buff, grey, and green, with an endleſs variety of combinations ariſing from the different ſhades of colour in the parent birds. Thoſe brought from Germany are generally variegated, or mottled, and are the leaſt valued, becauſe the heat of the ſtoves, generally uſed to warm the houſes in that country, renders the birds bred there tender and ſhort-lived; German birds ſeldom living above two or three years in this country: whereas the canary birds bred in England in the uſual way are ſaid to live eight or ten years. Olina tells us they commonly live 10 or 15 years; Salerne ſays 18, and we have known individuals that have ſurvived for a ſtill longer term of years.

The cock of the German kind is highly valued for its ſinging, having a very ſweet note, which it continues for ſome time in one breath without intermiſſion; and raiſes higher and higher by degrees, with great variety. In this bird the fore part of the head, the throat, the pinion of the wing, and the rump, in the cock bird, are of a brighter yellow than in the hen, which mark will hold good in all the canary birds, of whatever kind they may be. The cock is alſo bigger than the hen, his carriage more ſprightly and majeſtic, and he is obſerved frequently to extend his neck and head in a very briſk and lively manner. The hens ſing indifferently, inſomuch indeed as ſcarcely to deſerve the name of ſinging. Whenever the cock ſings, his throat may be ſeen to ſwell, and play all the while he is warbling, but in the hen there is no ſuch motion. The Hon. Daines Barrington has written an elaborate treatiſe upon the notes of ſinging birds, in which thoſe of the canary bird are treated upon at ſome length, and which may be conſulted with much ſatiſfaction by the curious reader. Vide Phil. Tranſ. v. 63. See SONG *of birds.*

Among a variety of other ſorts, there are two kinds of canary birds in particular that are much eſteemed among breeders; namely, thoſe birds which are all yellow, and thoſe which are mottled and have a yellow crown; the former, in the breeding ſtyle, being called gay birds, and the latter ſpangled, or fancy birds. The fancy breed are eſteemed the ſtrongeſt, and have the boldeſt ſong. Careleſs breeders often match a gay with a fancy bird, and then the produce, partaking of both kinds, are called mules, being foul irregular birds, and of no value for feather, though they may prove as good as any for ſinging. If you propoſe to breed gay birds, chooſe the cock and hen of a clear uniform yellow colour, without being ſpotted with foul feathers; for theſe indicate that the breed has ſome time before been croſſed. There are ſeveral ſubſcription ſocieties in London, which raiſe annual premiums for thoſe who rear the fineſt birds, and who have a pattern bird painted, or engraven and coloured, as a ſtandard of perfection, with his various characters explained in technical terms. The principal teſt of a good fancy bird conſiſts in his having a clean cap, i. e. the crown of his head defined by a horizontal line at the level of his eyes, and beak, is to be of a clean yellow or white, without being broke or ſpotted with foul feathers, as a ſingle feather of this deſcription is conſidered as a drawback from his perfection, though this degree of perfection is ſeldom found. Add to this, that his back, wings, and tail ought to be as clear from yellow or white feathers. The finer he is mottled on the back, and clearer yellow he is on the belly, the handſomer he will be eſteemed. Theſe general characters are equally requiſite in the hen as in the cock, beſides which there is a caſual variety in fancy birds, diſtinguiſhed either as mealies or junks; the mealy birds being thoſe whoſe crown and bellies are of a clean white or pale yellow, and the junks ſuch as have their crown, and belly of a deep yellow. The fine ſpangled ſort, commonly called French canary birds, and the mealy ones, are the beſt to breed with for thoſe who are very curious; becauſe a ſpangled cock with a mealy hen will produce a more regular ſpangled feather than if the cock and hen were both ſpangled, as they would then breed too high upon the yellow.

When individuals of an uniform colour are paired together, their young are of the ſame colour; a cock and hen that are grey generally produce grey birds; but if a male grey is put to a female white, or male white to a female grey, the brood will be more beautiful than the parents; and as the numbers that may be croſſed by ſuch combinations are inexhauſtible, we can at all times produce varieties in ſhade and tint, that have not appeared before. The mixtures that may be made of the ſpangled birds with thoſe of an uniform colour increaſe ſtill more the number of combinations that may be produced; and thus varieties in the ſpecies may be multiplied without end. It likewiſe often happens, that without the aſſiſtance of fancy birds, we have pretty little variegated birds which owe their beauty to the mixture of different colours in their parents or progenitors, ſome of which either by their father or mother's ſide may have been variegated.

With regard to the mixture of other ſpecies with the canary bird, the following obſervations have been collected. The birds that come from the junction of the citril, the ſiſkin, and the goldfinch, with a hen canary bird, are generally ſtronger than thoſe from a cock and hen canary bird. They ſing longer; and their voice is more ſonorous and ſtrong, but they are taught with difficulty; the greater part always whiſtle imperfectly, and it is ſeldom one can be found that is able to repeat a ſingle air correctly, or without miſſing.

When we wiſh to procure birds from a mixture of the goldfinch with a hen canary bird, the former muſt be two years old, and the latter one; becauſe the canary bird comes ſooner to maturity than the goldfinch, and in general they ſucceed beſt when they have been bred up together. But this is not abſolutely neceſſary; neither will the hen that has formerly hatched with a cock of its own ſpecies always refuſe the male of another ſpecies, as father Bougot had an opportunity of aſcertaining. "I happened (ſays Bougot) to put four male canary birds to eight females of the ſame ſpecies; ſome bad ſeeds poiſoned three of the males, and all the females loſt their firſt eggs: I reſolved to ſubſtitute three male goldfinches taken in a trap in place of the three dead canaries, and I put them into the cage about the beginning of May. Towards the end of July I had two neſts of mongrels, which ſucceeded to admiration; and the following year I had three broods with each goldfinch and hen canary bird. Theſe laſt in general do not breed with the goldfinch till they are from a year to four years old, and ſeldom after, while with their own ſpecies they continue to hatch for nine or ten years. The common variegated female alone will breed with the goldfinch beyond her fourth year. A goldfinch muſt never be let looſe in an aviary, for he deſtroys the neſt and breaks the eggs of the other birds." Hence we perceive that the hen canary birds, although accuſtomed to the males of their own ſpecies, will yield to the careſſes of the goldfinch, and will breed with theſe birds ſucceſsfully. Their union with theſe is even as fruitful as with their own natural males, ſince they lay three times in the year with the goldfinch. It is not ſo in the union of the male linnet with the hen canary bird; there being in that caſe only one brood, or very ſeldom two in the courſe of the year.

The baſtard birds, which proceed from the canary, and the ſiſkin, goldfinch, and ſome others, are by no means ſterile, but mongrels that can pair and propagate, not only with the goldfinches or the canary birds indiſcriminately, but alſo among themſelves, and produce offspring that can pair and perpetuate their varieties. But it muſt be owned that the produce of theſe mongrels is not ſo certain nor ſo numerous by any means as in the pure or unmingled ſpecies: they ſeldom hatch more than once in a year, and often lay eggs that are addled. Their ſucceſsful production depends on many little circumſtances that cannot be diſcovered, far leſs pointed out. It is ſaid, that among the croſs breeds there are always many more males than females. A female canary bird and a goldfinch, paired by Bougot, produced, in the ſame year, at three hatchings, nineteen eggs that were all fertile; among which there were only three females, the remaining ſixteen being all males. When a perſon wiſhes to pair the canary bird with the goldfinch, it will be beſt to take young goldfinches of ten or twelve days old from the neſt, and put them into a neſt with canaries of the ſame age. He ſhould feed them together, and leave them in the ſame cage, accuſtoming the goldfinch to the ſame food as the canary bird. It is uſual to put a cock goldfinch to a hen canary bird, as they pair more eaſily, and proſper better than the cock canary bird and hen goldfinch. It muſt, however, be obſerved, that the brood in the firſt caſe is later, becauſe the cock goldfinch does not pair ſo quickly as the cock canary. But when the female goldfinch is put to a male canary bird, the pairing takes place much ſooner. To ſucceed, a male canary bird is never to be put into a cage where there are females of its own ſpecies, for then he will prefer theſe to female goldfinches.

The union of the male canary with the female ſiſkin proſpers exceedingly well. A female ſiſkin, confined in an aviary for nine years, was known to have for the firſt five years three broods annually, and for the remainder of the time two broods a year, all of which proſpered. Linnets and canary birds have been put together, but they ſeldom breed unleſs the cock linnet be put with the hen canary bird; the female linnet will not even make a neſt, but drops a few eggs in the cage, which are generally addled, ſo that it is needleſs almoſt to compel the hen to ſit upon them. The chaffinch and yellow hammer are, with great difficulty, made to pair with the canary bird. A female yellow hammer has been left with a male canary for three years, during all which time the female laid only addled eggs; and it is juſt ſo with the female chaffinch, but the cock chaffinch and yellow hammer with the hen canary bird have produced ſome fertile eggs.

It follows from hence, and various other facts, that the ſiſkin alone will breed with the canary bird equally well, whether male or female; the hen canary bird produces likewiſe eaſily enough with the male goldfinch; not quite ſo eaſily with the male linnet; and laſtly, that it will breed, though more reluctantly, with the males of the chaffinch, the yellow hammer, and ſparrow, while the male canary is incapable of fecundating the females of any of the laſt, or at leaſt that the latter very rarely ſucceeds when paired with them.

The diſpoſitions of canary birds are extremely variable. There are ſome cocks that are always melancholy, and even ſullen, ſinging ſeldom, and then in a diſmal ſtrain; they are long in learning, and learn at laſt, but imperfectly, what you teach them, and that little which they acquire they very ſoon forget. They are often ſo uncleanly, that their feet and tail are conſtantly dirty; and they do not pleaſe the female, whom they never regale with their ſong, not even when their young firſt appear. There are others ſo wicked that they will kill the hen they are put to, and the only way to tame them is to give them two females, who join for their common defence, and when they have once vanquiſhed by force, the male becomes tamer, and they enſure their conqueſt afterwards by tenderneſs and love. Some of the males are ſo ferocious as to break and eat the eggs when the hen has laid them; or, if this unnatural father allows her to hatch them, the young are ſcarcely excluded from the ſhell of the egg, than he ſeizes them with his bill, drags them from the neſt, and kills them. Others are ſo wild and ungovernable, that they will neither allow themſelves to be touched nor careſſed; they muſt be left at liberty, and cannot be treated like the others: if they are meddled with in the leaſt they will not breed; their eggs muſt not be touched, nor taken away; and they will not hatch if they are not ſuffered to pair or build as they pleaſe. And laſtly, there are ſome of an indolent diſpoſition; ſuch, for example, are the grey ones; theſe never build, and the perſon that attends them muſt make a neſt for them. All theſe tempers are very diſtinct, and very different from favourite canary birds that are well-tutored: theſe are always gay, always ſinging, agreeable, of a happy diſpoſition, and endowed with the beſt inclinations.

The bad diſpoſition of the canaries frequently proceeds from miſmanagement. When they break their eggs and kill their neſtlings, they are oftentimes governed by the impulſe of impetuous love, and it is to enjoy the female that the male drives her from the neſt and deſtroys the tender objects of her affection. Accordingly, the beſt means of making ſuch birds hatch is not to put them into different cages. It is better to place them in a room well expoſed to the ſun; and to the eaſt in winter, where there are many hens and only few cocks, for then they will enjoy themſelves more, and multiply better. When a hen ſits, the cock finds himſelf another mate, and does not diſturb her. Beſides, the cocks have many quarrels among themſelves from jealouſy; and when they ſee any one ſo ardent as to torment the female and attempt to break the eggs, they beat him ſo ſeverely as to puniſh him effectually for his temerity.

When the canaries are about to build, they ſhould be furniſhed with lint, or ſhreds of linen, hair of oxen, moſs, and very ſmall and dry ſtraw. Goldfinches and ſiſkins, if put with hen canary birds, when mule birds are wanted, prefer ſmall ſtraw and moſs, but the canary birds like hair and lint: theſe ſhould be cut very ſmall, for fear the threads ſhould entangle the feet of the hen, and cauſe her to pull the eggs from the neſt as ſhe riſes from it.

For feeding them, you muſt place in the room a hopper, pierced all round ſo as to admit their heads, filled with a portion of the following compoſition: three quarts of rape-ſeed, two of oats, two of millet, and two of hemp-ſeed. Every twelve or fourteen days the hopper is to be filled, taking care that the ſeeds are clean and well winnowed. This food is proper as long as they have only eggs; but the evening before the young are excluded, they muſt have a dry cake kneaded without ſalt, which may be left till it be eaten, and then you may give them eggs boiled hard; a ſingle hard egg, if there are but two cocks and two hens, or more, in proportion to the number of birds. They muſt have no vegetables while breeding, as that would weaken the young too much; but, in order to vary their food a little, give them every third day, on a plate inſtead of the dry cake, a piece of white bread dipped in water, and preſſed with the hand; this bread not being ſuch ſubſtantial food as the cake will prevent them from growing too fat when hatching. It will likewiſe be proper to give at the ſame time ſome poppy ſeeds, but only once in two days, for fear of heating them too much: ſugar biſcuits generally produce this effect, which is followed by another ſtill more hurtful; for when they are fed on biſcuit they often lay addled eggs, or bring weak and ſickly young. While they have young, it is recommended to boil their rape ſeed, to deprive it of its acrimony.

After the eggs are laid, give the canary birds plantain and lettuce ſeed to purge them. The food of the neſtlings, when hatched, muſt be prepared: it ſhould be a paſte compoſed of boiled rape ſeed, a yolk of an egg, and crumb of the cake mixed, and kneaded with a little water, which is to be given to them every two hours. This paſte muſt not be too liquid, and, for fear of its turning ſour and injuring the birds, it ſhould be renewed every day till the young can feed themſelves.

Canary birds are diſtinguiſhed by different names, according to their age. Such as are about three years old, are called *runts;* thoſe above two, are named *eriſſs:* thoſe of the firſt year, under the care of the old ones, are called *branchers:* thoſe which are new flown, and cannot feed themſelves, *puſhers;* and ſuch as are brought up by hand, *neſtlings*.

The brood of birds in a ſtate of captivity is not ſo conſtant, but is, perhaps, more numerous than it would probably be in a ſtate of native freedom; for there are hens who will hatch four, or even five times a year, laying four, five, or ſix, and ſometimes even ſeven eggs at a time; in general, they have three broods, and the moulting prevents their having more. There are hens, however, that hatch while they moult, provided they begin to ſit before that time. Birds of the ſame neſt do not all begin to moult at the ſame time. The weakeſt are the firſt to undergo that change; the ſtrongeſt are often a month later. The moulting of jonquil canary birds is more tedious, and generally more fatal than that of the others. The hens of theſe jonquil birds lay only three times, with three eggs each time; the light-coloured ones, both cock and hen, are too delicate, and their brood ſeldom proſpers. The cream-coloured have ſome repugnance to pairing with one another, and in a large aviary it almoſt conſtantly happens, that a cream-coloured male will make choice of a female entirely of another colour. In general the white ones, however, pair, build, and hatch together, and commonly ſucceed better than when a white one is paired with another of a different colour.

Notwithſtanding the difference in the diſpoſition, temperature, and fertility of theſe birds, the time of incubation is the ſame in all. They uniformly ſit thirteen days, and when it happens a day leſs or more, it is owing to ſome accidental circumſtance; cold retards the excluſion of the young, and heat accelerates it. Accordingly, it happens ſometimes, that the firſt ſitting in April laſts thirteen days and an half, or fourteen days, if the air is at that time cold; on the contrary, the third hatching, which happens during the great heats of July or Auguſt, laſts only twelve days and a half. The bad eggs ought to be ſeparated from the good; but in order to know them certainly, you ſhould wait till they have been ſat upon for eight or nine days, then take each egg by the two ends for fear of breaking them, and hold them againſt the ſun, or a lighted candle; thoſe which appear clear are to be rejected as it would only fatigue the hen to no purpoſe to leave them in the neſt. In thus ſeparating the clear eggs from the complement of three neſts, we may ſelect only ſufficient to make up two of them; and the third hen being releaſed from ſitting, will proceed to lay again. It is a practice much recommended by bird-fanciers, to take away the eggs as the hen lays them, ſubſtituting an ivory one in the place of each, that the whole may be hatched together. When the laſt egg is laid, the ivory ones are removed, and the others replaced. In general, the time of laying is in the morning, about ſix or ſeven o'clock; it is ſaid, when this happens an hour later, it is owing to the hen's being ſick; the eggs being thus laid in regular ſucceſſion, it is eaſy to take them away the moment they are laid. However this practice is more adapted to our own convenience than to that of the bird, and is contrary to the economy of nature: it cauſes the mother to part with a great deal of heat unneceſſarily, and burdens her at once with five or ſix young which incommode her more than they give her pleaſure, while when ſhe ſees them come ſucceſſively one after the other, her pleaſures are multiplied, and her ſtrength and courage ſupported; accordingly, ſome very intelligent bird-fanciers aſſert, that the natural way has always ſucceeded better than the above-mentioned practice.

In their native country, canary birds haunt the banks of little rivulets and other watery places; we ſhould not, therefore, ſuffer them to want water, either to drink or bathe in. As they are natives of a very mild climate, they muſt be defended from the rigour of winter, although from long habit, they are now ſo far naturalized to our climate, as to live very well during the winter in a room without fire: ſome breeders accuſtom them even to live all the winter in a room with the window or windows open, and only guarded with a net-work to prevent their eſcape.

It is ſeldom that canary birds brought up in a chamber fall ſick before hatching; ſometimes a few cocks will over-eat themſelves and die; if the hen grows ſick while ſhe is ſitting, her eggs muſt be taken away and given to another; for though ſhe ſhould get better ſoon, ſhe will not return to her neſt. The firſt ſymptom of ſickneſs, eſpecially in the cock, is melancholy; whenever he is obſerved to loſe his natural gaiety, he muſt be put in a ſeparate cage, and placed in the ſun in the ſame room with the hen. If his feathers appear rough, you muſt look if he has not a pimple on the rump; this the bird ſometimes opens with his bill, but if not, it ſhould be pricked with a large needle, and the wound anointed with ſaliva, without mixing any ſalt with it, which would ſmart it too much. The moſt general cauſe of ſickneſs is too abundant, or too rich food; when theſe birds are made to breed in a cage or cloſet, they often eat too much, or ſelect the ſucculent food intended for the young, and hence ariſe the ill effects of repletion, or inflammation. By keeping them in a room, this may be in a great meaſure prevented; becauſe, being among a great number, they hinder one another from eating to exceſs. A cock who eats for a long time is ſure to be beaten by the other males; and the ſame is the caſe with the hens; theſe quarrels give them exerciſe, temperance, and occupation; and it is chiefly on this account that they are ſeldom or never ſickly in a chamber during the breeding time; it is only after hatching that infirmities and diſeaſes attack them. The greater part of them become afflicted with the pimple before mentioned, and afterwards all of them are ſubject to moulting. Some ſupport this change of ſtate extremely well, and do not fail to ſing a ſhort time every day, but moſt of them loſe their voice, and ſome even die. When the hens have attained the age of ſix or ſeven years, they moult with difficulty, and many of them die. Young canary birds moult early in the year: about ſix weeks after they are hatched they become melancholy, appear rough, and put their head under the wing. Their down falls in this firſt moulting, and in the ſecond, the following year, the large feathers, including even thoſe of the wings and tail, fall off. Cold weather is unfavourable to the canaries while moulting, and they would all die at this time, were they not kept in a temperate, or rather in a warm place. The uſual time of moulting is about ſix weeks or two months.

The moſt fatal, and common diſeaſe that the young canary birds are ſubject to, is what is called the ſurfeit, in which their bowels ſeem to deſcend to the extremity of the body. The inteſtines are ſeen through the ſkin in a ſtate of inflammation, redneſs, and diſtention; the feathers on that part fall off, the bird grows emaciated, gives over eating, though he ſits by his meat, and dies in a few days. The cauſe of this diſeaſe is the too great quantity, or ſucculent quality of the food. All medicines are fruitleſs; diet alone can ſave a few out of a number of birds thus affected. They muſt be put into ſeparate cages, and nothing given to them but water, and lettuce-ſeed; this food is cooling and purgative, it tempers the ardour that conſumes them, and ſometimes occaſions evacuations that ſave their lives. In ſhort, we may obſerve, that this diſeaſe proceeds ſolely from our method of rearing theſe birds. We ought, therefore, to be particularly cautious of over-feeding them, when we bring them up: boiled rape-ſeed, a little groundſel without ſugar, or biſcuit, and in general rather too little than too much food is to be recommended.

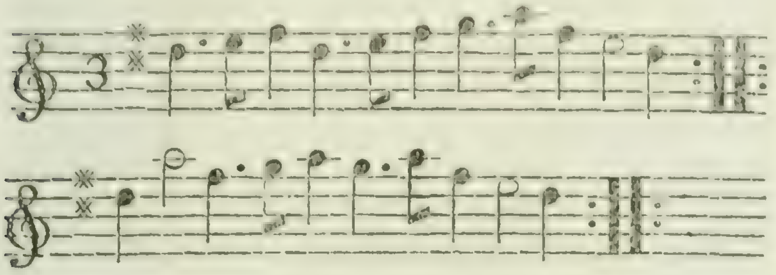
When the canary bird utters a faint and frequent cry, which ſeems to iſſue from the bottom of his ſtomach, he is ſaid to be aſthmatic; he is alſo ſubject to a ſort of extinction of the voice, eſpecially after moulting. The aſthma is cured by adminiſtering plantain ſeed, and hard biſcuit ſoaked in white wine, and the voice may be reſtored by giving him for food the yolk of eggs mixed with crumbs of bread, and for his drink, water in which liquorice root has been ſliced and ſteeped, or if boiled in it, ſo much the better. Canary birds are likewiſe affected with ulcers in the mouth, which are ſuppoſed to proceed from a ſuperabundance of ſucculent food, as in the former caſes: theſe ulcers commonly occaſion an inflammation in the throat, and palate, which can only be cured by adminiſtering a cooling diet, and for this purpoſe nothing can be better than lettuce-ſeed, with a few ſeeds of the melon bruiſed, and infuſed together in water. The impoſthume is another diſorder to which the canary birds are liable: the moſt approved medicine for this diſorder, we are told, is to anoint the top of the head for two or three days with an ointment made of freſh butter and capon's greaſe melted together. After anointing the head three or four times, it ſhould be examined, to ſee whether the part of his head affected be ſoft; and if ſo, open it gently and let out the matter, which will be like the yolk of an egg. When this is done, anoint the wound, and the bird will ſoon be cured. Unleſs this precaution be taken, the canary birds afflicted with this diſorder are very apt to fall down ſuddenly and expire.

Theſe birds are alſo infeſted with a peculiar ſort of louſe, and ſcab, owing to the ſlovenly manner in which they are kept by ſome people. Care ſhould be therefore taken to have them always clean, to give them water to bathe in occaſionally, to be choice in their food, and never to put them into cages of old wood. Thoſe cages it has been recommended, to have made either of walnut-tree, or oak with bars of wire. Cages of the uſual cylindrical form are objected to as being improper, ſince they allow the birds very little room to walk in, and without this exerciſe they become melancholy, or at leaſt, loſe a conſiderable ſhare of their natural vivacity: the cages that are conſtructed of a lengthened form, high, and narrow, are the beſt adapted to the purpoſe of breeding and rearing this beautiful ſong-bird, when the breeder cannot devote a room to that object alone.

CANARIENVOGEL, according to Friſch the canary bird *Fringilla canaria*.

CANARIE, Fr. a quick dance in jig time. The word is twice uſed by Shakeſpeare,—"*Canary* to it with your feet."—*Love's Labour loſt.*—"And make you dance *canary* with ſpritely fire and motion."—*All's Well.*

Merſenne gives a ſpecimen of the kind of movement. He ſays the cabriolles are rapid, and the figure extremely difficult.



Purcell has *canaries* in his muſick to Diocleſian. The tune is ſaid to come originally from the *Canary* iſlands.

CANARII, in *Ancient Geography*, a people of Africa, who inhabited the diſtrict towards the ſouth-eaſt of Mount Atlas. Pliny mentions them, and ſays, that they eat the fleſh of dogs.

CANARINA, in *Botany*. Linn. Mant. 225. Schreb. 603. Willd. 689. Juſſ. p. 164. Vent. vol. 2. p. 470. Claſs and order. *Hexandria monogynia*. Nat. Ord. *Campanaceæ*, Linn. *Campanulaceæ*, Juſſ. Gen. Ch. *Cal.* Perianth ſuperior, ſix-cleft, permanent; ſegments lanceolate, recurved. *Cor.* monopetalous, bell-ſhaped, ſix-cleft, nerved; nectary of ſix valves, equal, covering the receptacle, diſtant. *Stam.* Filaments ſix, awl-ſhaped, ſpreading outwards, originating from the valves; anthers pendulous from the tip. *Piſt.* Germ inferior, hexagonal; ſtyle conical, ſhort; ſtigma longer than the ſtamens, club-ſhaped, ſix-cleft. *Peric.* Capſule ſix-angled, obtuſe, ſix-celled. *Seeds* numerous, ſmall. Eſſ. Ch. Calyx ſix-cleft, corolla ſix-cleft, bell-ſhaped, ſtigma, ſix-cleft.

It differs from Campanula only in number; a difference which, if allowed to be a ſufficient generic diſtinction, will baniſh many ſpecies from the genera in which they have been very naturally placed, and have long quietly ſtood. Linn. Mant. 225. Willd. Mart. Lam. Ill. Pl. 259. Bot. Mag. 144. Sp. 1. C. *campanula*, (C. canarienſis, Linn. Sp. Pl. 29. Tourn. 109. Pluk. Alm. tab. 276. fig. 1.) "Stem erect; leaves halbert-ſhaped, in threes or oppoſite." *Root* perennial, ſpindle-ſhaped. *Stem* three feet high, herbaceous, erect, rather feeble, round, even, knotty, branched; branches two or three from each knot; upper ones longer, dichotomous at the end; little branches alternate. *Leaves* on the ſtem by threes, on the branches oppoſite, petioled, unequally toothed, even, veined. *Flowers* from the forks of the upper branches large, peduncled, drooping; corolla reddiſh-yellow, or orange, brighter at the bottom, with a yellow eye; each ſegment marked with three purple branched nerves; anthers yellow. A native of the Canary iſlands, whence the genus, though not very properly, has derived its name. 2. C. *Zanguebar*, Lour. Cochinch. 195. "Stem climbing: leaves halbert-ſhaped alternate." *Stem* ſhrubby, round, even, branched. *Leaves* heart-halbert-ſhaped, quite entire, ſmooth, veined, petioled. *Flowers* ſolitary, lateral: corolla pale-coloured. *Capſule* ſomewhat egg-ſhaped, ſharp at the baſe, ſix-nerved, opening at the baſe, ſeeds heart-ſhaped, compreſſed, ſurrounded by a turbinate ring, odorous. A native of Zanguebar on the coaſt of Africa.

*Propagation and Culture.* The firſt ſpecies only has been cultivated in Europe. It is propagated by parting the roots, which ſhould be done in July, ſoon after the ſtalks are decayed. It ſucceeds beſt in a light ſandy loam, with a fourth part of ſcreened lime-rubbiſh. The pots ſhould at firſt be placed in the ſhade, and unleſs the ſeaſon be very dry, ſhould not be watered. About the middle of Auguſt they ſhould be placed under the hot-bed frame, and as the nights grow cool, covered with the glaſſes. When the ſtalks appear, the plants ſhould be ſometimes, but not often, refreſhed with a ſmall quantity of water. About the middle of September they ſhould be removed into a dry airy glaſs-caſe, where they may enjoy the free air in fine weather, and yet be ſcreened from cold. They flower from January to March, when they ſhould be frequently watered. In ſpring, when the ſtalks begin to decay, the pots ſhould be ſet abroad in the ſhade and not watered. Miller.

CANARIUM, from *canis*, *dog*, in *Antiquity*, a Roman ſacrifice, wherein dogs of a red and ruddy colour were ſacrificed, for a ſecurity of the fruits of the earth againſt the raging heats and diſorders of Sirius in the dog-days.

CANARIUM, in *Botany*, (from its vernacular name Canari, in the Malay language) Linn. Mant. 127. Schreb. 1516. Juſſ. 370. Gært. 605. Claſs and Order. *Diœcia pentandria*. Nat. Ord. *Terebintaceæ*, Juſſ.

Gen. Ch. Male. *Cal.* Perianth two-leafed: leaves egg-ſhaped, concave, permanent. *Cor.* Petals three, oblong, reſembling the leaves of the calyx. *Stam.* Filaments five, very ſhort; anthers oblong, the length of the petals.

Female. *Cal.* as in the male: leaves reflexed. *Cor.* as in the male. *Piſt.* germ egg-ſhaped: ſtyle ſcarcely any: ſtigma capitate, triangular. *Peric.* Drupe dry, egg-ſhaped, acuminate, ſurrounded at the baſe with a ſcolloped membrane. *Seed.* Nut egg-ſhaped, triangular, acute.

Eſſ. Ch. Calyx two-leaved. Corolla tripetalous. Stigma nearly ſeſſile. Drupe with a triangular nut.

Sp. 1. C. *commune*. Linn. Mant. 127. (C. vulgare Rumph. Amb. 2. p. 145. Tab. 47.) β. C. Mehembethene. Gært. tab. 102. fig. 1. A reſinous lofty tree. *Trunk* covered with a whitiſh bark; wood whitiſh, tolerably ſolid, but not durable. *Leaves* alternate, unequally winged; common petioles ſtriated; leaflets nine, large, petioled, oblong egg-ſhaped, acuminate, even. *Flowers* whitiſh, ſeſſile, ſtiff, divaricated panicles, which terminate the branches. Gærtner aſſerts that the commune of Linnæus, and the mehembethene are mere varieties of the ſame ſpecies. He has figured the fruit of mehembethene, and given the following deſcription. *Drupe* ſuperior, berried, acuminate-egg-ſhaped; ſkin olive-coloured, thin; pulp ſmall in quantity, full of capillary fibres: ſhell bony, egg-ſhaped, either ſlightly pitted or even, trigonous, three-celled, with three obtuſe teeth at the tip, marked with three obſcure raiſed lines on the ſides, and perforated through its whole length with a thread-ſhaped axillary canal. *Seeds* oblong-egg-ſhaped, two in each cell, only one of which comes to maturity. The drupe of the other variety is a little larger, and the pulp without fibres. The ſhell is more ſharply triangular, and its ſides are perfectly ſmooth, nearly flat, without the middle raiſed line. The fertile cell and ſeed are alſo larger. In the oldeſt ſeeds Gærtner never found the kernel rancid, but always ſweet, with a flavour reſembling that of freſh almonds which, as he obſerves, is the more remarkable, becauſe the cotyledons, when the integument of the ſeed is ſtripped off, ſeem beſmeared with oil, are very ſlippery, and repel water.

A native of the Molucca Iſles and New Guinea. The nuts are eaten by the natives either raw, or made into a kind of bread. An oil is alſo expreſſed from them which is uſed at the table. When eaten freſh they are ſaid by Rumphius to bring on dyſenteries, and to occaſion an oppreſſion of the breaſt. 2. C. *ſylveſtre*, or Nanarium. Rumph. amb. 2. tab. 49. Gært. tab. 102, fig. 3. *Drupe* fleſhy, inverſely egg-ſhaped, round, not trigonous as in the preceding; ſhell egg-ſhaped, ſtony, very thick, obſcurely trigonous, marked with three depreſſed longitudinal lines, to which as many ſmall callous tubercles are joined below the top of the ſhell; cells three, two of which are often abortive, the third very irregular, and lined with a very ſmooth cartilaginous cruſt. *Seed* oblong, trigonous, curved in the form of the letter S, gibbous in contrary directions near each end. The kernel, on account of its ſingular form and brittleneſs, cannot be got out entire, unleſs the ſhell be opened carefully from one end to the other. 3. C. *decumanum*, Rumph. tab. 55. Gært. tab. 102. fig. 2. *Drupe* the largeſt of any in the genus; ſhell oblong-egg-ſhaped, triangular, ſtony, thick, with ſix teeth at the tip; angles prominent, ſmooth, longitudinally furrowed; ſides pitted with numerous oblong depreſſions as if they had been eaten by worms; axillary canal triangular; cells three, large. *Seeds* wanting in the ſpecimen examined by Gærtner. Profeſſor Martin has repreſented the laſt two alſo as only varieties of C. commune: but it is evident, from Gærtner's deſcriptions and references to Rumphius, that he judged them to be diſtinct ſpecies.

Loureiro calls this genus Pimelea, on account of its oily produce, but that name has been given for a ſimilar reaſon to a very different ſet of plants, natives of New Holland and New Zealand. See Pimelea. Loureiro has added to the C. commune of Linnæus, which he calls Pimelea alba, two other ſpecies which he found in Cochin-China and its neighbourhood. 4. C. *nigrum*. Leaves winged; flowers in lateral racemes: nuts two-celled. An oil is extracted from its kernel, not leſs agreeable than that of the olive, but heavier on the ſtomach. 5. C. *oleiferum*. Rumph. vol. i. tab. 54. Leaves pinnated with four pair of leaflets; peduncles lateral, many-flowered; nut one-celled. The drupes are eaten like thoſe of the firſt ſpecies; an oil for the table is likewiſe procured from them. When the bark is wounded, there exudes a yellowiſh, odorous, oily reſin, ſimilar to copal, which is uſed to varniſh houſehold furniture. The ſubſtance called Damar or Dammar in the Eaſt Indies, and uſed for the calking of ſhips, is compoſed of this reſin, mixed with the bark of the bamboo reduced to powder, and a little chalk. It is preferable to all other ſubſtances for this purpoſe with reſpect both to its durability and tenacity, and has not the ſmell of European pitch. Boſc. in Nouv. Dict. The trivial name given by Loureiro to the laſt ſpecies is a bad one, not being at all diſcriminative.

Canarium, in *Conchology*, a ſpecies of Strombus, found in the ſeas and great rivers in the ſouthern parts of Aſia. This ſhell is ſomewhat heart-ſhaped, with the lip round, ſhort, retuſe, and with the ſpire ſmooth. Linn. &c. Length two inches and a half; colour yellow, or brown, with tranſverſe fuſcous angulated lines; pillar ſnowy white. The general contour of the ſhell remarkably ventricoſe.

Canarium of Rumpfius is the ſpecies of Strombus deſcribed by Linnæus under the name of Gibberulus.—Canarium is alſo the name given by Rumpfius to the Linnæan Strombus Urceus, which ſee.

CANARY, in *Geography*, a town of Poland, in the palatinate of Sandomirz; 16 miles W. of Sandomirz.

Canary, *Grand*, ſtill known by the name *Canaria*, given to it by Pliny and Ptolemy; one of the Canary iſlands, from which the general appellation is derived; ſituate between Teneriffe on the weſt, and Forteventura on the eaſt, about 100 miles N.W. from Cape Bojador on the African coaſt. N. lat. about 27°. W. long. 15°.

This iſland is about 100 miles in circumference, and the number of inhabitants amounts to 40,000. Pliny ſays, that it formerly produced a ſort of dates, and pine-apples in great abundance. The ſoil, though light and ſandy, is covered with a rich mould, which produces two harveſts in the year. The wheat and other corn are reckoned very good; ſugar canes are much cultivated; the vines yield thoſe grapes from which is made the wine called ſack, or canary; and the iſland abounds with excellent fruits, ſuch as apples, pears, melons, figs, peaches of ſeveral kinds, and plantains. It has alſo plenty of horned cattle, ſtags, poultry, pigeons, and partridges. Wood is ſcarce. Filtering-ſtones conſtitute an article of traffic from this iſland, as well as from Forteventura. The capital of the iſland, and alſo of the Canary iſlands, is Palma or Canary: the other towns are Galder, Tirachana, and Luz.

Canary, called alſo *Palma*, in Latin *Civitas Palmarum*, and in Spaniſh *Cividad das Palmas*, the capital of the preceding iſland. Although the governor and the chief people of diſtinction commonly reſide at Teneriffe, yet Canary is the ſee of a biſhop, ſuffragan to the metropolitan of Seville in Spain, who uſually reſides in this town, and has a tribunal of inquiſition. The royal audience, or ſovereign council of the Canaries, over which the governor preſides, is held in this town, and receives appeals from all the other iſlands. The revenues of the biſhop, amounting to 10,000l. a year, are almoſt entirely diſtributed in acts of charity through all the iſlands; and the preſent biſhop (ſee Emb. to China, vol. i. p. 117.) joins to this humane diſpoſition, the rigour of eccleſiaſtical diſcipline, and encourages the obſervance of ceremonies of piety, by offers of indulgence to thoſe who practiſe them. This town is ſeated on the ſouth-weſt ſide of the iſland, at a ſmall diſtance from the ſea. Its climate is temperate; its extent about a league in circumference; its cathedral is magnificent; and its houſes, though only one ſtory high, and flat at the top, are generally elegant buildings; it has four convents. The number of inhabitants is eſtimated at 12,000. N. lat. 28° 10′. W. long. 15° 36′.

✗ Canary *Iſlands*, a cluſter or groupe of iſlands in the Atlantic Ocean, ſituate about 150 miles to the weſt of the empire of Morocco in Africa, between N. lat. 27° 15′ and 30°. W. long. 13° and 17° 30′. They are generally ſuppoſed to have been the ſame with the *Inſulæ Beatæ*, or *fortunate iſlands* of the ancients, particularly deſcribed by Ptolemy and the elder Pliny, and ſo called on account of the ſingular temperature of their climate, the fertility of their ſoil, and the excellence of their fruits. Ptolemy, however, if he meant theſe iſlands, has placed them 11° too near the equinoctial, or in the 16th degree of N. latitude, whence ſome have concluded, that this appellation belonged to the Cape de Verd iſlands. But Strabo aſſigns them a ſituation which agrees with the obſervations of modern geographers. Some have derived their name from *canis*, dog, on account of the number of large dogs which were found on the iſland Canaria or Canary, two of which were preſented to Juba, king of Mauritania. Others deduce the origin of the name from the Canaanites, or Phœnicians, who are ſaid to have often ſailed from the continent to Carne, ſuppoſed to be a contraction of Canary. The number of the Canary iſlands has been differently ſtated, both by ancient and modern geographers. Pliny and Ptolemy reckon ſix; Plutarch and others mention only two; modern geographers have generally reckoned 13, excluſive of Madeira, which is at a conſiderable diſtance to the north: but the inhabited iſlands have been reduced to ſeven, viz. Palma, Gomera, Ferro, Teneriffe, Grand Canary, Forteventura, and Lancerota; ſee each reſpectively. To theſe have been added the following ſix ſmall iſlands, viz. Lobos, Roca, Gracioſa, Santa Clara, Allegrança, and Inferno, beſides a cluſter of rocks, called the Salvages, between Madeira and the Canaries. Teneriffe, though not the largeſt, is probably the moſt fertile of the Canary iſlands, and its population amounts to nearly 100,000 perſons. That of the Grand Canary has been already ſtated; that of Palma is eſtimated at 30,000; of Forteventura at 10,000; of Lancerota at 8000; of Gomera at 7000: and of Ferro at 1500: the total according to this enumeration amounts to 196,500: but others reckon the population of Teneriffe at 64,000, and the whole at 140,000. The air of that iſland is pure and temperate, and the ſoil is fertile; the product is wheat, barley, rice, and oats; the excellent canary wine is obtained chiefly from Teneriffe and Palma: Gomera is noted for ſilk; and the tree yielding the juice called dragon's blood is not uncommon. Fruits of various kinds are of excellent quality, and are cultivated in great abundance. Theſe iſlands are well ſupplied with cattle, ſuch as cows, ſheep, goats, and wild aſſes, which run about the mountains in droves; their woods are ſtored with varieties of the feathered kind, of which the canary birds are well known; and the ſurrounding ſeas are ſtocked with ſhoals of fiſh, particularly ſturgeon. All the iſlands have ditches and marſhes filled with water at ſpring-tides, and afterwards evaporated by the heat of the ſun, ſo as to yield a fine ſea-ſalt. Flax, aniſeeds, and coriander are cultivated in the different iſlands. Archil and ſumach grow ſpontaneouſly. See ARCHIL. Kali is found along the ſea-ſhore, and might afford as good ſoda as that of Alicant. The cotton ſhrub and alſo the ſugar-cane are much neglected. Potatoes have within the laſt 30 or 40 years been introduced in theſe iſlands; and at preſent they conſtitute almoſt the chief food of the inhabitants. Wheat and barley are ſown in November and December, and uſually reaped in April and May. The corn is careleſsly raked together, carried home in ſacks on the backs of aſſes, mules, or camels, and then trodden out by cattle, and the grain ſeparated from the chaff by expoſing it to the wind. The lands are not rented in the Canaries: the landholder furniſhes the ſeed and implements of huſbandry, and receives one half of the produce, beſides a certain quantity of wheat for each head of cattle, which he lends to the tenant. Bread is only eaten by the richer inhabitants. The people in general ſubſiſt much on "goffio" which is only parched grain ground by a little hand-mill, of which every cottage poſſeſſes one. Thoſe who uſe better fare have recourſe to ſalt fiſh and potatoes. The poor inhabitants of Palma and Gomera are ſometimes reduced to the neceſſity of making cakes of the roots of the "pteris aquilina," or male fern, which they dig in the mountains. Lupines are a choice food for cattle; but they are previouſly ſoaked in water and boiled with the addition of ſalt. The capital of the ſeven inhabited iſlands is the town of Palma, or Canary, in the iſle of Canary.

Hiſtory gives no certain information with regard to the original inhabitants of theſe iſlands. Some ſay, that they were exiles from Africa, whom the Romans baniſhed thither, after cutting out their tongues, for having blaſphemed their gods. But how perſons, deprived of the organ of ſpeech, could form any language, peculiar to themſelves, and tranſmit it to poſterity, it is not eaſy to conceive; and, therefore, this circumſtance attending their origin is probably fabulous. It is ſaid, however, that all the deſcendants of the ancient inhabitants ſpeak the ſame language, though diverſified into different dialects. Their clothing conſiſted of hides and ſkins; and they inhabited caves and rocks in perfect harmony and union. Their food was the fleſh of horned cattle, dogs, and the milk of goats; and they prepared a kind of pudding, or bread, of milk and triturated corn, called "goſſio," which is now common under the ſame name. The firſt diſcovery, as well as the original ſettlement of theſe iſlands, is involved in conſiderable obſcurity. It appears, however, that they were imperfectly known to the Spaniards, in conſequence of ſome of their piratical excurſions, about the middle of the 14th century. Pope Clement VI. it is ſaid, having preached a ſermon to prove that he had the ſole right of creating kings and beſtowing kingdoms, exerciſed the prerogative, Nov. 15th, A.D. 1344, of creating Lewis de la Cerda, deſcended from the royal family of Caſtile, king of the Fortunate iſlands, ſuppoſed to be the Canaries; though the new monarch was unable to diſcover in what part of the world his new dominions were ſituated. At length, in 1393, or 1395, or, as others ſay, 1405, ſome private adventurers from the coaſt of Biſcay extended their piratical excurſions as far as theſe iſlands; and John de Bethencourt, a Norman baron, obtained a grant of them from Henry III. of Caſtile. Bethencourt, with the valour and good fortune which diſtinguiſhed the adventurers of his country, attempted and effected the conqueſt, and with the conſent of the Spaniſh court, aſſumed the title of king of the Canaries; and the poſſeſſion of them remained for ſome time in his family, as a fief held of the crown of Caſtile. In 1431 the grant of them was confirmed to John II. king of Spain, or Caſtile, by pope Eugenius IV.; and in 1483 Ferdinand and Iſabella, king and queen of Spain, being before poſſeſſed of four of theſe iſlands, conquered the iſland called Grand Canary; and alſo the two remaining iſlands; and by the treaty of peace between Ferdinand, king of Caſtile, and Alphonſo, king of Portugal, it was agreed that theſe iſlands ſhould belong to Spain, in lieu of the ſettlements on the continent of Africa, ceded to Portugal: accordingly, they have all remained in the poſſeſſion of Spain to this day. Thoſe whom the Spaniards found in poſſeſſion of theſe iſlands they denominated Guanches; and the appellation has been tranſmitted to their deſcendants. They are repreſented as gigantic in ſtature and barbarous in their manners. They were idolaters and polygamiſts; and their property was common poſſeſſion. Ignorant of the uſe of iron, they cultivated the earth with the horns of bullocks, and ſheared their ſheep, and ſhaved themſelves, with whetted flints inſtead of inſtruments of iron. Although they were denominated barbarous, they were ſingularly humane, and abhorred the idea of ſhedding blood. When any one of their princes died, they waſhed his body, and placing him erect in a cave, they put a ſceptre in his hand, with two jars by his ſide, one filled with milk, the other with wine, as the neceſſary proviſion for his journey. When Cadamoſto viſited the Canaries in 1445, each iſland was divided into a number of provinces or diſtricts, of which Teneriffe contained nine; but among theſe little ſtates wars overſpread the face of the country with carnage and blood; and yet their military weapons conſiſted merely of ſtones and two kinds of lances, one armed with horn, and the other wood hardened and pointed in the fire. For protection againſt the ſcorching ſun in ſummer, and againſt the inclement cold in winter, they anointed their bodies with a mixture of tallow and the juice of certain plants, which tinged their ſkins with various colours, red, yellow, and green; and both men and women uſed this extraordinary defence and ornament. Each iſland and each ſtate had its peculiar form both of religion and government; although within the ſame ſociety every thing was common; viz. religion, cuſtoms, language, manners, and property itſelf. In Teneriffe there were no leſs than ten different ſects of idolaters,

ters, ſome of whom worſhipped the ſun, and others the moon, and the reſt of the heavenly bodies. Although polygamy was allowed, the virginity of the bride rightfully belonged to the chief; and the parties thought themſelves highly honoured when he claimed his right. Upon the acceſſion of a new prince, it was the cuſtom to ſacrifice a number of young perſons of both ſexes in honour of him, and in order to procure bleſſings upon his reign. This was done by precipitating themſelves from a ſteep rock, after the performance of many abſurd ceremonies, till they were daſhed in pieces by the violence of the fall. The parents of theſe infatuated victims were diſtinguiſhed by the favour of the reigning prince. The preſent Guanches are ſtout and robuſt, though inferior in ſize and ſtrength to their anceſtors. Their complexion is tawny, and their noſes large and flat. Their genius is lively; they are brave, active, and cunning, and are much addicted to war. Their appetite is ſingularly voracious; and they live upon grain formed into cakes with milk and honey; and their food is preſerved in ſkin-pouches, which they ſuſpend to their belts and girdles, and in which they likewiſe bake them in the ſmoke. Some rigidly abſtain from wine and alſo from animal food. Such are their alertneſs and activity, that they run up and down mountains, and ſpring, by means of long poles, from rock to rock with aſtoniſhing agility. In all their conteſts they uſe ſtones, and throw them with a force equal to that of a muſket-ball. Dr. Sprat (Hiſt. of the Royal Society, p. 212, &c.) has related a variety of other curious anecdotes concerning this people. The race of the Guanches, however, is now almoſt extinct. The few who remain in Teneriffe are entitled to ſome very trifling ſtipend, as a price of the ſubmiſſion of their anceſtors, from the court of Spain, which they punctually, and with ſome ſenſations of pride, annually demand. Many of the dead bodies of thoſe Guanches have been found in perfect preſervation, in an erect poſture, placed againſt the ſides of caves dug into the mountains; the bodies being wrapped round with ſeveral folds of goats' ſkins. The total net revenue of the crown, after defraying the expences of adminiſtration, of all the Canary iſlands, amounts to about 60,000l. a year. See TENERIFFE, &c.

CANARY, an iſland of the South Pacific Ocean. S. lat. 1° 51′ 36″. E. long. from Paris 127° 35′.

CANARY *bird*, in *Ornithology*, *Canary finch*. See CANARIA *Fringilla*.

CANARY, in *Agriculture*, a ſort of plant cultivated in ſome of the more ſouthern diſtricts, as Kent, &c. for the ſmall ſeed which it produces. It is obſerved, in the Agricultural Survey of that county, "that there are three kinds of tilths for it; namely, ſummer-fallow, bean-ſtubble, and clover-lay: the laſt the writer conſiders beſt. If the land is not very rich a coat of rotten dung is frequently ſpread for it." But whether manured or not, the tillage neceſſary is to plough the land the firſt opportunity that offers after wheat ſowing is done; and as ſoon as it is tolerably dry in the ſpring, furrows ſhould be made, about 11 or 12 inches apart, and the ſeed ſown broad-caſt about four or five gallons per acre, and well harrowed in. When the blade appears, and the rows are diſtinct, the intervals are immediately hoed with a Dutch hoe, and afterwards, in May or June, the hoeing is repeated with a common hoe, carefully cutting up every weed, and thinning the plants in the furrows, if they are too thick. It is cut in the harveſt, which is always later than any corn crop, with a hook provincially called a *twibil* and a *hink*, by which it is laid in lumps or wads of about half a ſheaf each. The ſeed clings remarkably to the huſk, and in order to detach it the crop muſt be left a long time on the ground, to receive moiſture ſufficient to deſtroy the texture of the envelopement, otherwiſe it would be hardly poſſible to threſh out the ſeed. The wads are turned from time to time, to have the full benefit of the rains and ſun, and thereby render them as dry as poſſible.

It is remarked, that the price of reaping canary in the iſle of Thanet was formerly from ſix to eleven ſhillings per acre, and the prices of threſhing and dreſſing it five or ſix ſhillings the quarter: but at preſent they are conſiderably higher. According to the goodneſs of the land, and the tillage that has been beſtowed upon it, the farmers then expect their returns to be from 25 to 50 buſhels per acre, but the common crop is from 30 to 34. It was formerly the practice to ſow ſucceſſive crops on the ſame land for eight or ten years, but this practice is now juſtly exploded. It is added, that ſowing canary would be a very great improvement to lands which lie convenient for water-carriage to London markets, was it not a crop the farmer ought by no means to depend upon, not only becauſe the return or quantity it yields varies greatly, but alſo on account of the fluctuation in the price of the ſeed in the markets. Some adviſe ſowing this crop in drills a foot aſunder, thinning the plants out afterwards, ſo as to leave them about two inches diſtant in the rows. Three gallons of ſeed in this way are ſufficient for an acre, where a hopper is made uſe of ſo ſet by a ſpring as to deliver the ſeeds at equal diſtances. It ſhould be ſown about the end of February.

The chaff of this ſeed affords a large proportion of good horſe-food.

CANARY-*graſs*, a ſort of graſs which can ſeldom be cultivated with advantage as a meadow or paſture graſs: but one of the kinds of which is grown in ſome diſtricts for the ſeed. See CANARY.

CANARY-*graſs*, in *Botany*. See PHALARIS *Canarienſis*.

CANARY-*weed*. See LICHEN *Roccella*.

CANAS, in *Ancient Geography*, a town of Aſia Minor in Lycia, which was formerly epiſcopal.

CANAS and CANCHES, or TINTA, in *Geography*, a juriſdiction of Peru in South America, in the dioceſe of Cuſco, commences about 15 or 20 leagues S. of Cuſco, and extends about 20 leagues in every direction. The Cordillera divides it into two parts; the higheſt called *Canas*, and the loweſt *Canches*. The latter, by reaſon of the temperature of its air, yields all kinds of grains and fruits; whilſt the former affords paſture for very numerous flocks and herds; and in the meadows between the eminences are fed no leſs than 25 or 30 thouſand mules, brought hither from Tucuma to paſture. Here is a very great fair for theſe animals, to which dealers reſort from all parts of the dioceſe. In the part called Canas is the famous ſilver mine denominated Condonoma.

CANASERAGA CREEK, a creek of North America, which runs north-weſtward into Geneſſee river at Williamſburg, in the ſtate of New York.

CANASIS, in *Ancient Geography*, a town of Aſia, ſeated on the coaſt of the Erythrean ſea, in Carmania, according to the Periplus of Nearchus.

CANASTRON, a promontory of Macedonia, at the extremity of the peninſula of Pallena, between the Thermaic and Toronaic gulfs.

CANATAGUA, a mountainous ridge which paſſes N. and S. between the provinces of Veragua and Panama, in the Spaniſh territories of N. America.

CANATH. See KENATH.

CANATTE CORONDE, a name given by the Ceyloneſe to a peculiar kind of cinnamon growing in that iſland: this is eſteemed the ſecond kind in value, and the name they give to it ſignifies bitter and aſtringent cinnamon. The bark of this kind of cinnamon-tree comes off very eaſily, and is of a very fragrant ſmell when freſh, but it has a bitter taſte. It is not very common in the iſland, and is not eaſily difdiſtinguiſhed on the tree from the beſt cinnamon. The trees which yield the eight different kinds of cinnamon, ſo very various in flavour and virtue, are all ſo like one another, that it requires a great deal of attention to diſtinguiſh them. The root of this kind of cinnamon-tree yields a very fine ſort of camphor. Phil. Tranſ. N° 409. See CINNAMON.

CANAVARIUS DEMETRIUS, in *Biography*, a diſtinguiſhed phyſician, and voluminous writer in medicine, born at Genoa, in 1559, received his education at Rome, where he became extremely popular as a phyſician, and acquired a conſiderable property. He died in 1625. The principal of his works are "De Ligno Sancto Commentarius;" Romæ 1602, 8vo. in which he gives the diſtinguiſhing characters of the genuine wood; a ſpurious kind having found its way into the ſhops, and been uſed in its ſtead, "Ars Medica." Gena fol. 1626. This is a republication of his account of all the diſeaſes incident to the human frame, with the mode of treating them, taken from the moſt approved writers, originally printed in 8vo. at Venice, here much enlarged and improved. Haller, Bib. Med. Eloy. Dict. Hiſt.

CANAVEZ, in *Geography*, a diſtrict of Italy, in the principality of Piedmont, of which Ivrea is the capital.

CANAVEZES, a town of Portugal, in the province of Entre Duero é Minho; 27 miles E. of Porto.

CANAWISQUE, a weſtern branch of the river Tioga, in America, which riſes in Pennſylvania.

CANCALE, a ſea-port town of France, in the department of the Ille and Vilaine, and chief place of a canton, in the diſtrict of St. Malo; celebrated for oyſters: 3 leagues E. of St. Malo. N. lat. 48° 41′. W. long. 0° 31′.

CANCANI, or CANGANI, *promontory of the*, in *Ancient Geography*, is placed by Ptolemy in the iſle of Albion, and is thought to be Braychipult point in Caernarvonſhire.

CANCARELLA ASPARAGI of Valiſn. in *Entomology*, ſynonymous with *cryptocephalus campeſtris* of Fabricius.

CANCELIER, in *Falconry*, is when a light-flown hawk, in her ſtooping, turns two or three times upon the wing, to recover herſelf before ſhe ſeizes.

CANCELLARIUS, in *Antiquity*. See CHANCELLOR.

CANCELLATA, in *Conchology*, a ſpecies of ARCA, the ſhell of which is marked with cancellated ſtriæ, and bearded; the margin gaping in the middle. Schroet. Inhabits the American ocean.

*Obſ.* In its natural ſtate this kind is covered with a moſſy epidermis, or membranaceous coating, beneath which the ſhell is of a ſomewhat fuſcous colour, mixed with white, and beſet on both ſides with four tufts of hair; beaks ſlightly recurved; poſterior depreſſion lanceolate.

CANCELLATA, a ſpecies of NERITA, the ſhell of which is marked with decuſſating ſtriæ and impreſſed dots; ſpine ſlightly clavated; umbilicus gibbous and bifid. This inhabits the coaſts of the American iſlands. Chemnitz.

*Obſ.* This ſhell is white, and obſoletely ſpotted, and is ſometimes marked with rays or a fulvous band.

CANCELLATA, in *Entomology*, a ſpecies of CICADA, found in Denmark. The colour is yellow, with three dots on the ſcutel, and tip fuſcous; wings white and reticulated. Mull. Zool. Dan.

CANCELLATA, in *Ornithology*, a ſpecies of TRINGA, ſeven inches and an half in length, that inhabits Nativity Iſland. Latham calls it the *barred phalarope*. The upper feathers are brown edged with white; lower ones white with tranſverſe duſky lineations; feet pinnated and duſky.

CANCELLATE, in *Botany*, open like lattice-work. A term applied to the involucre in atractilis cancellata, to the capſule of the lily, &c.

CANCELLATUM, in *Conchology*, a ſpecies of BUCCINUM, of a ſmall ſize, mentioned by Seba. The ſhell is glabrous, with ſtreaks and lines that variouſly decuſſate each other. Native place unknown.

CANCELLATUM, a ſpecies of CARDIUM, of ſmall ſize. This kind is reddiſh, thin, roundiſh, with decuſſating ſtriæ. Gualt. &c.

CANCELLI, in *Building*, lattices, or a ſort of windows made with croſs bars of wood or iron, chequer-wiſe.

The term is alſo applied to the baluſters or rails which compaſs a court of juſtice, a communion-table, or the like.

CANCELLI, in a *Military Senſe*, the ſame with BARRIER.

CANCELLING, in the *Civil Law*, an act whereby ſome former deed is rendered null and void.—This is otherwiſe called *reſciſſion*. The word comes from the Latin *cancellare*, *to encompaſs*, or *pale a thing*. In the proper ſenſe of the word, *to cancel*, is to deface an obligation, by paſſing the pen from top to bottom, or acroſs it; which makes a kind of chequer lattice, called by the Latins *cancelli*.

CANCELLING *of deeds*, *letters patent*, and *wills*. See theſe articles.

CANCELLUS, in *Entomology*, a Fabrician ſpecies of GAMMARUS (*Cancer*, Linn.) found in the rivers of Siberia. It is ſpecifically diſtinguiſhed by having four hand-claws which are deſtitute of fangs, and ſixteen feet. Pallas deſcribes the ſame inſect under the name of *cancellus*, but as an oniſcus. This crab is of a ſmall ſize, being very little larger than *gammarus locuſta*, and has the firſt pair of antennæ incurvated.

CANCELLUS *araneoides*, Petiver's name of *Phalangium reniforme*. Linn.

CANCER, *the Crab*, in *Aſtronomy*, one of the twelve ſigns of the zodiac, and one of the 48 old conſtellations; ordinarily repreſented on the globe in form of a crab, and in aſtronomical books denoted by a figure much reſembling that of the number ſixty-nine; thus ♋. The reaſon generally aſſigned for its name, as well as figure, is a ſuppoſed reſemblance which the ſun's motion in this ſign bears to that of the crab-fiſh. As the latter walks backwards, ſo the former in this part of his courſe begins to go backwards, or recede from us; though the diſpoſition of ſtars in this ſign is by others ſuppoſed to have given the firſt hint to the repreſentation of a crab. The Greeks pretend that when Hercules was contending with the Lernæan hydra, a crab which crawled upon the marſh ſeized his foot. The hero, however, cruſhed the reptile to pieces under his heel; but Juno, in gratitude for the offered ſervice, though inconſiderable, advanced the creature to the heavens. The ſtars in the ſign Cancer, Ptolemy makes 13; Tycho 15; Bayer and Hevelius 29; Mr. Flamſteed no leſs than 83. For an eſtimate of the comparative brightneſs of ſeveral ſtars in the conſtellation Cancer by Dr. Herſchel, ſee Phil. Tranſ. vol. lxxxvii. p. 311, &c.

CANCER, *tropic of*, a leſſer circle of the ſphere parallel to the equator; and paſſing through the beginning of the ſign cancer. See TROPICS.

CANCER, in the *Military Art*. See ARIES.

CANCER, in *Surgery*, is a diſeaſe reſpecting which the moſt enlightened and experienced practitioners, for more than two thouſand years, have confeſſed their extreme ignorance; while ſome of the illiterate and unſkilful part of mankind have never ceaſed to boaſt of their ſpecific remedies, and ſtill continue to impoſe on the unfortunate victims of this deſtructive malady.

It cannot be at all doubted that numerous caſes on record, denominated *cancer*, and perhaps all thoſe in which cures of this diſeaſe are ſaid to have been performed without deſtroying or removing the part affected, were complaints of a very different nature, and ſometimes of an entirely oppoſite character. A large proportion of the remedies employed by empirics and nurſes for the cure of cancer includes thoſe means which, after long and mature trial, have been rejected as inefficacious by regular ſurgeons; and, it is well known, that the more innocent (becauſe leſs active) ointments, and other compoſitions, now publickly advertiſed by cancer-curers, are ſuch as no perſon could have propoſed who had the ſlighteſt acquaintance with the real forms of this diſeaſe.

The ambiguous and undeciſive ſtate of our knowledge in the diagnoſtic ſigns of cancer, has been a moſt fertile ſource of error and deception; and, "while we remain unfurniſhed with authentic ſtandards," or eſtabliſhed data, "by which all obſervations may be examined, it ought not to excite ſurpriſe, if the ſame name be aſſigned to two complaints, the hiſtories of which are repugnant to each other; or, if oppoſite modes of treatment be directed for diſeaſes that bear a common appellation." See Mr. Pearſon's "Obſervations on Cancer," pref. p. v.

A great deal of commendable pains has been lately taken, by the promoters of two public inſtitutions in London, to inveſtigate the nature and treatment of carcinomatous diſorders; but, from the firſt reſults of their labours, we ſcarcely can ſay that any approaches have yet been made towards the attainment of ſo deſirable an object. One of theſe gentlemen has ſhewn, with much clearneſs and acumen, that our beſt definitions of ſcirrhus and cancer have been very inaccurate and erroneous; whereas another ſurgeon, of conſiderable reputation and experience, affirms that "there can be no difference of opinion reſpecting the nature of the complaint;" for, ſays he, "the truly ſcirrhous tumour, which is known to be capable of forming the cancerous poiſon, when allowed to increaſe in ſize, has been ſo often deſcribed, that every ſurgeon muſt be enabled from thoſe accounts to pronounce the tumour, when he meets with it, to be of that kind. See Mr. Home's Obſervations on Cancer, 8vo. Lond. 1805, p. 156. This author likewiſe thinks he has proved decidedly, "that cancer is not a diſeaſe which immediately takes place in a healthy part of the body, but one for the production of which it is neceſſary the part ſhould have undergone ſome previous change, connected with diſeaſe;" whereas Mr. Pearſon has adopted the contrary opinion, viz. "that a cancer is always an original diſeaſe, and never appears as the ſequel of any morbid affection whatever."

The truth is, we are ſtill in the dark concerning the proximate cauſe of ſcirrhus and cancer, or the nature of that peculiarity of conſtitution in different perſons and ſexes, which prediſpoſes them to this malignant derangement of animal ſtructure. We do not even know preciſely in what the cancerous ſtate of an organ conſiſts; and it is yet debated in the medical world whether or no the diſeaſe be local;—although, in our own judgment, the affirmative propoſition is always true in the early ſtages of a cancer.

If we may credit the accounts publiſhed by various authors, it appears that there is ſcarcely any part of the body which is wholly exempted from the attacks of a cancerous affection: but it has been aſcertained by reiterated obſervation, that glandular parts are much more liable to this diſeaſe than any other; and it is to a gland only that we are accuſtomed to apply the term SCIRRHUS, which denotes a morbid condition invariably tending to the ſtate of a perfect or genuine cancer.

The name of ſcirrhus has too vaguely and unguardedly been applied to indurated tumours of the non-ſecreting or abſorbent glands, and hence has ariſen the epithet of "venereal or ſcrofulous ſcirrhi;" ſo that patients labouring under ſuch indurations have often been alarmed without any neceſſity. Indeed, Mr. Pearſon ſays, he "never met with an unequivocal proof of a primary ſcirrhus in an abſorbent gland." We entirely agree with this judicious writer, that ſuch an occurrence is exceedingly rare; but we have ſeen at leaſt one caſe of idiopathic ſcirrhus in the abſorbent glands of the groin, which proved fatal.

A true ſcirrhus, before it degenerates into a cancerous ſore, is hard and unequal on its ſurface, ſlightly ſenſible to the touch, not tending to ſuppuration, and enlarges very ſlowly in its commencement; but at length, aſſuming a more active form, it is ſurrounded with ſuperficial varicoſe veins, when it becomes rather painful, and changes the texture of the adjacent cellular membrane or cuticular covering, to which it frequently adheres: the ſkin will, in this advanced period, ſometimes be diſcoloured, and puckered or retracted, eſpecially in the female breaſt; perhaps attended with a degree of ſoftneſs or fluctuation in ſome part of the tumour, with ſhooting pains in its neighbourhood; and at laſt breaking into a malignant ſore, with fungous fleſh, and retroverted edges, where it is named an open cancer.

Eroding, ſordid, and rebellious ulcers will ariſe ſpontaneouſly in various parts of the body, without being preceded by a ſcirrous tumour; and, as many of thoſe reſemble the cancerated ſore, in their general appearance and fatal termination, they have been indiſcriminately ranked among cancers, for want of a better claſſification. See the articles ULCER, LEPROSY, and ELEPHANTIASIS.

The ſcirrhous tumour, above deſcribed, which has a conſtant tendency to degenerate into a confirmed cancer, (though not always equally rapid in its progreſs) will ſeldom or never yield to diſcutient applications; and ſhould therefore be extirpated without delay, if the circumſtances of the patient do not otherwiſe prohibit this operation. The ſcirrhus, on its removal, will exhibit a ſomewhat different appearance in its ſtructure, according to the progreſs it has previouſly made towards maturity. In its early ſtage, the centre is more denſe and ſemi-cartilaginous than the circumference, the whole being interſected by irregular bands of a ligamentous texture, blended with glandular ſubſtance; but as it advances, this central point is leſs obſervable, although the interſecting filaments ſtill exiſt, and an irregular ſpongoid cavity is formed within the tumour, filled with a bloody fluid. Sometimes the maſs is compoſed of ſeveral diſtinct portions, enveloped by the ligamentous bands diſpoſed in concentric circles; and in other caſes there are cyſts of various magnitude, in different parts of the tumour, which Dr. Adams believes to be real hydatids, poſſeſſed of vitality.

Means have been adopted by ſeveral practitioners at different times, to analyſe ſcirrhous or cancerous maſſes; but without affording, hitherto, any ſatisfactory reſults. Indeed, the teſts to which they have ſubmitted theſe morbid ſubſtances muſt have entirely decompoſed them and altered their nature; ſo that, probably, we ſhall not obtain much uſeful information by having recourſe to chemical agents for this purpoſe.

The chief deſideratum in ſurgical practice, is to diſcriminate between ſcrofulous indurations and ſcirrhous tumours in the living body; for it is a queſtion, on which the well being of patients muſt often depend, to determine the preciſe nature of a diſeaſe, before we proceed to active meaſures. Notwithſtanding the apparent confidence with which Mr. Home, in a paſſage we have quoted, ventures to pronounce reſpecting the facility of diſtinguiſhing and aſcertaining a ſcirrhous affection, he, in another part of this book (p. 167.) acknowledges himſelf to have frequently been miſtaken in his diagnoſis; and theſe are his words:

"So much does the ſame diſeaſe differ in its appearances, in different patients, from the endleſs peculiarities of their conſtitutions, by which every part of their body muſt be more or leſs influenced, that it is not poſſible in practice to diſtinguiſh, in all caſes, between cancerous and ſcrofulous tumours, after they have advanced to a certain ſize; and I am ready to confeſs that, in *many inſtances*, I have miſtaken the one for the other, and have removed, by operation, tumours which, at the time, had the appearance of being cancerous; and upon examination, after their removal, found them of a ſcrofulous nature. On the other hand, I have neglected to remove tumours, from the circumſtances making it probable that they were ſcrofulous; which afterwards became cancerous, and deſtroyed the patient."

In all ſuch doubtful caſes, it is the ſafeſt rule to adviſe the removal of the tumour, if it be ſituated fairly for the operation; as it is a much leſs ſerious inconvenience to get rid of a diſeaſed ſcrofulous gland, than to retain a ſcirrhous tumour, which probably might coſt the patient his life, in the event of its contaminating the adjacent parts by its malignity. There is reaſon to ſuſpect that many ſurgeons, who boaſt of their extraordinary ſucceſs in extirpating cancers, have ſometimes diſſected out tumours which might very innocently have remained: for the ſurpriſing diſparity we find, in the reſults of the practice of different ſurgeons, is not capable of being reconciled by any other ſuppoſition.

Thus Mr. Nooth aſſerts "that in 102 ſchirrous caſes, in the early ſtage of the diſeaſe, where he performed the operation, all remained free from any return of the complaint;" whereas Dr. Monro ſen. ſays, "of ſixty cancers, which he had ſeen extirpated only *four* remained free of the diſeaſe for two years," and theſe became cancerated afterwards!

This report of the late Dr. Alexander Monro (in Edin. Med. Eſſ. Vol. 5.) is ſo very diſcouraging, that it will not be improper to ſuppoſe the failures in thoſe caſes aroſe from ſome peculiarly untoward circumſtances; and yet we have another account, by Mr. J. Hill, "of no leſs than 88 genuine cancers, all ulcerated except four," being extirpated by himſelf, and "all the patients but two recovered of the operation." Mr. Hill ſays, "of the firſt 45 caſes, only one proved unſucceſsful: in three more the cancer broke out in different places: and a fifth was threatened with ſome tumours at a diſtance from the original cancer; theſe tumours did not appear till three years after the operation; but the woman was carried off by a fever before they had made any progreſs. All the reſt of the 45 continued ſound ſo long as they lived, or are ſo to this day; one of them ſurvived the operation above 30 years; and 15 are ſtill alive, though the laſt of them was cured in March 1761.

"Of the next 33, one lived only four months; and, in five more, the cancers broke out afreſh after having been once healed.

"The reaſon why, out of 45 caſes, only four or five proved unſucceſsful, and ſix out of 33, was owing to the following circumſtance: the extraordinary ſucceſs I met with made cancerous patients flock to me from all corners of the country, ſeveral of whom, after delaying till there was little probability of a cure by extirpation or any other means, forced me to perform the operation, contrary both to my judgment and inclination.

"Upon a ſurvey in April 1764, the numbers ſtood thus:

| | | |
|---|---|---|
| "Total cured - - - | | 63 |
| "Of whom, when cured, there were aged between - - - | 70 and 80, | 15 |
| | 60 and 70, | 17 |
| | 50 and 60, | 18 |
| "Below 50, or ages unknown | | 13 |
| | | 63 |

| | | |
|---|---|---|
| "Of the above 63, there were alive in April 1764, | | |
| "Aged between | 80 and 90, | 4 |
| | 70 and 80, | 8 |
| | 60 and 70, | 12 |
| "Below 60, or ages unknown - - | | 15 |
| | In all | 39 |

"In 28 of the above number, the operation had been performed more than two years before.

"In 11, the operation had been done in the courſe of the two laſt years.

"So that, upon the whole, after a courſe of 30 years practice, 39 of 63 patients were alive and ſound.

"From the above ſurvey, it appears, that the different patients lived as long after the extirpation of the cancers as, according to the bills of mortality, they would have done, had they never had any cancers, or undergone any operation.

"The remaining 25, which compleat the 88, were cured ſince the year 1764, 22 of whom have been at leaſt two years cured: one or two of theſe patients were 70 years of age, one 90.

"Mrs. Mundal was 90 when ſhe got a cancer cut off her cheek, 28th June 1768; another appeared on her under-lip in 1770, and was extirpated on the 5th of April that year. After both which ſhe recovered; but a tumour appeared below the *maxilla*, which carried her off in November 1771, above three years after the firſt exciſion; that is, when ſhe was 93 years old.

"The ſum therefore at preſent, July 1770, ſtands thus:

| | |
|---|---|
| "Of 88 cancers extirpated, at leaſt two years ago, | |
| "Not cured - - - | 2 |
| "Broke out afreſh - - | 9 |
| "Threatened with a relapſe - - | 1 |
| | 12 |

"Which is leſs than a ſeventh part of the whole number.

"At this time there are about 40 patients alive and ſound, whoſe cancers had been extirpated above two years ago.

"Of five cancered breaſts, only one was ulcerated, which, with one of the occult kind, did not heal; a third relapſed, probably owing to the whole not being fully cut away; the other two are ſtill firm and ſound in 1772, though one of them was cut October 25th 1761, and the other April 26th 1766." See Mr. Hill's Caſes in Surgery, 12mo. Edin. 1772.

This author's experience, we perceive, was by no means ſo diſcouraging as that of Dr. Monro, nor was it ſo completely unfailing as that of Mr. Nooth: but it ſhould be remarked, that Mr. Hill's caſes were much worſe, and more advanced than thoſe of Mr. Nooth, while the circumſtances are not known which occaſioned the ill ſucceſs alluded to by Dr. Monro. Upon the whole then, we think the numerous patients who are afflicted with external cancers need not ſit down in deſpair; as if it were uſeleſs to undergo the operation, when performed in due time, and by a ſkilful ſurgeon. The reſult of our own practice has not been ſo favourable as that of Mr. Nooth, but has proved at leaſt as ſucceſsful as Mr. Hill's; and we have no reaſon to doubt that our contemporaries have been equally happy in their experience after the operation.

To avoid the diſtreſs and pain attendant on ſuch a ſurgical operation as that of cutting out the part affected, a great variety of means, both external and internal, have been propoſed for the cure of cancer: theſe may be ranked under the ſeveral heads of 1. Diſcutients.—2. Corroſives.—3.

3. Narcotics. We could ſubjoin a long liſt of thoſe remedies from the vegetable, animal, and mineral kingdoms; but ſince no ſurgeon of reputation will truſt to any of them, after the varied trials which have been ſo often made, both in this country and upon the continent, we ſhall not extend the preſent article by reciting their names and ſuppoſed qualities. A few words may, however, be added reſpecting the moſt eligible means of palliating ſymptoms either before the cancer is confirmed, or when it has gone on to a ſtate of ulceration, and cannot be extirpated.

Many hard ſwellings in the breaſt, eſpecially thoſe of a ſcrofulous kind, and ſuch as appear after child-bearing, have been miſtaken for cancerous tumours; but they may generally be diſperſed by the early and repeated application of leeches, bathing with camphorated ſpirits, ſoap liniment, hemlock poultices, ſaturnine lotions, or gentle rubbing with mercurial ointment. It has been juſtly obſerved by Mr. Home, "that the ſucceſs met with in ſome of theſe caſes is often productive of material miſchief, by inducing the practitioner to be too ſanguine, and to go on with the uſe of the ſame means in other caſes, encouraged by his former ſucceſs, till the diſeaſe has arrived at the ſtate of a true cancer; and therefore has advanced beyond that ſtage in which it might have been removed by the operation of extirpating the tumour."

It is of great importance, on the one hand, not to alarm our patients prematurely, by giving too haſty and unfavourable an opinion; but, on the other hand, practitioners would do well to weigh all the circumſtances which may enable them to decide on the nature of ſuch tumours, and if they are confident of their being carcinomatous, to loſe no time in adviſing the only ſtep which can be taken for the ſecurity of the unfortunate ſufferer.

The following are Mr. Hill's rules of determining whether an external ſwelling be of a cancerous nature or not; viz.

" 1. When ſchirrous tumors are conſiderably advanced, they are ſurrounded with large varicoſe veins, reſembling crabs claws, from which reſemblance they have got the name of cancers. The abſence of theſe, therefore, is a favourable circumſtance, but not to be abſolutely depended on.

" 2. The ſkin of a cancer, when near burſting, is of a reddiſh blue, or a blue livid colour, adheres to the under part of the indurated gland, (from which it was originally detached), and is puckered up into ugly folds, as if ſcorched.

" 3. On the other hand, the ſtruma, or boil, when inflamed, is always accompanied with a fever, which keeps pace with the degree of inflammation. But a cancer is never attended with a high inflammatory fever. It is true, the exceſſive pain of a cancer ſometimes quickens the pulſe, but at the ſame time ſinks it.

" 4. The ſkin of the inflamed ſtruma, or phlegmon, inſtead of being wrinkled or plaited, is ſmooth, red, and ſtretched, ſo as ſometimes to have a glazed appearance; and, when near burſting, the matter is always found fluctuating below, which ſeldom happens in cancers. On the contrary, cancers are generally accompanied with a corroding humour, which abrades the cuticle, till the outer parts are conſumed; but no matter is perceived within; whereas, in the ſtruma, &c. the ſcarf-ſkin is the laſt part that gives way, unleſs it be ſcalded or fretted by too hot poultices.

" 5. The cold ſcrophulous tumor is in ſtill leſs danger of being miſtaken than the inflammatory kind. For the pain and hardneſs are not ſo conſpicuous as in the inflammatory tumor; and the matter accumulates for a long time before it burſts. In either kind, if good pus appear, there is no occaſion for being afraid of a cancer: and, although the pus ſhould not be of the moſt laudable kind, but of a whitiſh ſanious aſpect, ſtill it is never ſo acrid as that which proceeds from a cancer. Nay, even a red, bloody, or ſanious matter, is not of itſelf a characteriſtic ſymptom of a cancer. Excepting the caſe mentioned above, I have never ſeen any cancer that contained matter; but I have ſeen numbers of other ulcers, in bad habits of body, full of bloody ichor."

The boaſting cancer-curers of our time have not ſufficient knowledge to diſcriminate between the different kinds of tumours they meet with, and perhaps too little honeſty to confeſs that the caſes in which they have ultimately had ſome ſucceſs were really not cancerous; for ſuch an acknowledgement would annihilate their traffic, and deſtroy their ill gotten reputation. But our own opportunities have enabled us to affirm, that this mercenary claſs of practitioners ſubſiſt chiefly by impoſing on the credulous and inexperienced part of mankind, eſpecially the weaker ſex, who are terrified with curable diſorders, falſely named cancers.

Suppoſing it to be aſcertained that a cancer exiſts, and it has proceeded to a ſtate of ulceration, not admitting of a ſurgical operation, the patient ſhould avoid uſing any means of relief which irritate and give pain; unleſs it be propoſed to deſtroy the whole by a cauſtic, which indeed is a far more tedious, uncertain, and tormenting plan of treatment than by cutting out the part.

The topical applications to an open cancer, which have been found moſt uſeful to alleviate pain, cleanſe the ſore, or to correct the fetid ſmell ariſing from it, are as follow:—1. Freſh bruiſed hemlock leaves.—2. Scraped young carrots.—3. The fermenting poultice.—4. Finely levigated chalk.—5. Powdered charcoal.—6. Carbonic acid gas.—7. A watery ſolution of opium.—8. Liquid tar, or tar-water. The internal remedies which have been moſt beneficial are, 1. Very ſmall and long continued doſes of arſenic.—2. Liberal doſes of cicuta.—3. The free uſe of opium.—4. Belladonna.—5. Solanum.—6. Martial flowers.—7. Corroſive ſublimate.—8. The juice of clivers or gooſe-graſs. But neither the external nor internal remedies, however apparently uſeful for a time, can be in the leaſt depended on for the cure of a genuine confirmed cancer.

The removal of ſcirrhous tumours and cancerous excreſcences may be effected in various external parts of the body; but no ſurgeon perhaps could now be found to undertake the exciſion of any internal organ, for example the uterus. Attempts have been often made by ignorant and bold empirics to deſtroy a cancerous ulcer of the womb by corroſive injections; but the practice is as cruel as it is abſurd, and we have ſeen the moſt dreadful conſequences from ſuch attempts, without affording the ſmalleſt relief to the unhappy patient. Several examples are recorded of the uterus having been exſcinded, and ſome of theſe women have ſurvived; but no caſe, that we know of, is related of ſuch an operation being performed for the purpoſe of extirpating a cancer, although we are aware that it has been lately propoſed by a ſpeculative writer of Germany. See Med. and Phyſ. Journ. vol. xi. p. 34.

The circumſtances which indicate the propriety of an operation are theſe:—1. When the cancer is ſo ſituated as not to expoſe any large blood-veſſels or nerves to be cut during the operation.—2. When the whole of the morbid parts can certainly be removed.—3. When the diſeaſe has ariſen from ſome accident, and not ſpontaneouſly.—4. When the patient is otherwiſe healthy.—5. When the cancer has not ſhewn evident ſymptoms of conſiderable malignancy during its progreſs, and does not ſeem to have involved the adjacent glands or abſorbent veſſels. The two firſt of theſe requiſites are not to be diſpenſed with; for unleſs we can diſſect out all the morbid parts, without incurring the danger of dividing important nerves or arteries, this operation muſt never be attempted.

The mode of operating will vary in different caſes and ſituations. Some excellent directions are given on this ſubject by Meſſrs. Fearon, Home, Pearſon, Bernſtein, Richter, Le Dran, Sabatier, and Calliſen; which young ſurgeons ſhould conſult, in particular emergencies: the only general rules we can here lay down are,

1. To make the external wound nearly in the direction of the ſubjacent muſcular fibres, and to make it large enough for the removal of all the morbid parts.
2. To ſave all the ſkin which is not diſeaſed, unleſs there ſhould be too much to heal up neatly.
3. To ſecure every bleeding veſſel, by a ligature, which might hazard a ſubſequent hæmorrhage.
4. To maintain the lips of the wound in cloſe contact, without interpoſing any dreſſing or extraneous ſubſtance between them.
5. To preſerve the parts in an eaſy and ſteady poſition for ſome days, before they are looked at or opened.
6. To uſe no other than mild and cooling applications during the cure.

The only point of importance on which we have as yet offered no obſervations, but which will nevertheleſs be deemed highly deſerving of general attention, is the comparative advantages and diſadvantages attending the modes uſually employed for the extirpation of cancers.

This is a ſubject, reſpecting which, unprofeſſional readers, eſpecially thoſe who ſuffer from the complaint, may naturally deſire to make up their minds; and, on that account, we ſhall not heſitate to lay before them the judicious remarks of a late author, who has treated this queſtion very amply. See Home's Obſerv. pp. 178—189.

" There are two modes by which a cancer may be extirpated; one is, taking out all the parts that are diſeaſed, by a cutting inſtrument; the other, making uſe of ſuch applications as will render them dead, and thereby occaſion their being thrown off.

" The advantages attending the operation by the knife are ſuch as to give it a decided preference in all cancerous diſeaſes. It is the only mode which is capable, in the more advanced ſtate of the diſeaſe, of removing the contaminated parts to a great extent; and, in doing it, the ſurgeon is enabled to take away with preciſion every part he thinks liable to have been affected. When the operation is over, he can examine the diſeaſed part that has been extirpated, and ſee whether it is every where ſurrounded by healthy parts; and, if it is not, by referring it to its natural ſituation can remove any part which may give him the leaſt cauſe to ſuppoſe that it is contaminated. The ſkin, after ſuch an operation, is in a looſe ſtate, and admits of its edges being brought together, ſo that the wound may always be much diminiſhed in ſize; and, in very many inſtances, the cut edges may be brought together like thoſe of a ſimple inciſion.

" The operation is only of a few minutes continuance, and the moment it is over, the parts are in a ſtate to commence the proceſs which is neceſſary for their recovery; and in the courſe of two or three weeks they are entirely healed, even where the diſeaſe has not been completely removed.

" The modes of deadening the diſeaſed part, which have at different times been employed, are three; and as theſe have ſometimes been preferred to the operation by the knife, and ſome of them are ſtill in uſe, it becomes neceſſary to explain in what way they acquired their reputation, and to ſhew the diſadvantages which attend their operation.

" In the earlier times, when the knowledge of cancer was ſtill more imperfect than it is at preſent, an idea was entertained of its growth being ſimilar to that of a vegetable; and it was therefore thought that unleſs it was taken out by the roots, the diſeaſe was not completely removed. It was then found that very active cauſtics were capable of deadening the whole tumour, which is always more or leſs of an irregular form; and when the diſeaſed part was thus brought away, the projecting portions were conſidered as the roots of the cancer; and the proof of its being completely eradicated was, that the ſore readily admitted of being healed. Any recurrence of the diſeaſe from the contaminated parts, which had not been deſtroyed, was ſuppoſed to ariſe from the conſtitution having been in a diſeaſed ſtate, and not from any failure of the action of the cauſtic: and in this way the original idea of its being a conſtitutional diſeaſe was moſt probably formed.

" The fact is, that diſeaſed parts have leſs powers of ſupporting themſelves than healthy ones, and therefore are more readily deſtroyed; ſo that a powerful cauſtic acts to twice the extent, in a diſeaſed part, to what it does in a natural one; and an indolent tumour can have every part of it deadened by means that would only produce a violent inflammation upon the common ſkin. It was therefore by no means an unfair concluſion, till it was contradicted by experience, that ſuch applications as were capable of deadening every part that was in a diſeaſed ſtate without acting upon the healthy ſurrounding parts, were to be preferred to the operation by the knife; and it is within my own remembrance, that ſuch an opinion was general in London. Since that time, two things have been aſcertained, which prove, that when the tumour has become cancerous, ſuch cauſtic applications are incapable of removing the diſeaſe entirely; the one, that when the poiſon is once formed, the contamination precedes and extends beyond the diſeaſed alteration of ſtructure; the other, that every thing which irritates the diſeaſed part increaſes its action, and its power of contamination: and in fact, all regular practitioners have laid aſide the arſenical applications to cancerous tumours in the breaſt, in conſequence of finding that the diſeaſe was rarely removed by them.

" They ſtill retain a certain degree of reputation, and are uſed by ſeveral empyrics in London; and cures performed in this way are well authenticated; that is, they ſucceed when applied to tumours which are yet in an indolent ſtate, if they are ſufficiently powerful to deſtroy the whole tumour; and as there is no poſſibility of aſcertaining what the ſtructure of the tumour was, which has been thus deſtroyed, it is ſtated by the practitioner to have been an inveterate cancer, which is attempted to be proved by ſhewing its roots, or the irregularities upon its external ſurface. But the cauſtic, when too weak for the deſtruction of the diſeaſed part, irritates, and makes it ſooner become cancerous. When applied to a cancerous tumour, although ſtrong enough to deaden the whole, it irritates the ſurrounding parts that have been previouſly contaminated, and makes them ſooner aſſume the characters of the diſeaſe. This not only happens when cauſtic applications are uſed, but when mortification takes place from any other cauſe, as in the caſe ſtated in a former part of this work.

" This fact of the contaminating power of morbid poiſons being increaſed by any thing that irritates the diſeaſed parts, is not peculiar to cancer. It happens alſo in the venereal diſeaſe, of which too many inſtances have come under my own obſervation.

" It has been, for ſome years, a favourite practice to attempt the cure of chancres by touching them with cauſtic, while yet of a ſmall ſize, and repeating the application till a ſound ſurface is expoſed, after the ſlough has been thrown off, and then to allow it to heal. The effect of this practice is exactly ſimilar to what has been ſtated. The chancre is cured, but the poiſon is abſorbed, and the conſtitution contaminated by the diſeaſe. But if the chancre be ſo ſmall, when the cauſtic is firſt applied, that the whole ulcer and ſome of the ſurrounding parts are deadened completely by one application, the patient will then be perfectly cured of the diſeaſe; as there was not time for abſorption before the application was made, and its effects were ſuch as to preclude its taking place afterwards. If, on the contrary, the firſt application only deſtroys a part of the diſeaſe, it irritates the abſorbents, and gives them a diſpoſition to take up the poiſon at an earlier ſtage than is uſual. From an experience of this being the caſe, I have for many years entirely left off the practice of uſing ſuch modes of treatment, in the early ſtages of chancres.

"The cauſtic applications which have been employed for the deſtruction of cancerous tumours are the following: arſenic, corroſive ſublimate, and the actual cautery. As theſe means are alſo uſed for the purpoſe of removing other tumours, whoſe ſtructure prevents the knife from being employed, I have had frequent opportunities of making obſervations on their comparative effects. Indeed the ſtatement contained in the ſecond caſe which has been mentioned in this volume, explains their different effects upon the ſame perſon, ſo as to afford us the moſt ſatisfactory information reſpecting them.

"The only preparation of arſenic which I have uſed, is equal parts of the white arſenic and ſulphur; theſe proportions were firſt recommended to me by Mr. Cline. This acts as a powerful cauſtic, and appears capable of deſtroying any tumour which has not acquired the diſpoſition to throw out a fungus. The ſloughs formed by each application will be very much in proportion to the quantity of the powder applied. By this means I have removed a large tumour in the cheek, which appeared to be taking on the previous ſtate to becoming a cancer. I have alſo deſtroyed a large tumour in the foot. In the laſt caſe it certainly affected the conſtitution, in a manner very ſimilar to what has been already deſcribed. In the other, no ſuch effect was produced; ſo that it would appear that the arſenic is in ſome caſes abſorbed more readily than in others.

"The local effect of arſenic is that of producing ſo violent a degree of inflammation in the part to which it is applied, that mortification enſues. When applied to the ſtomach, indeed, it deſtroys the patient before mortification abſolutely takes place; and the apparent effects of inflammation upon the part, are not ſuch as would deſtroy life, were they produced by any other cauſe. It is to be preſumed therefore that the arſenic, taken internally, kills by being abſorbed, and producing effects in the circulation incompatible with life. Several inſtances of patients dying from the effects of arſenic upon the internal coat of the ſtomach have come under my obſervation, and ſpecimens of its local effects are preſerved among the morbid preparations in the Hunterian Muſeum.

"Corroſive ſublimate appears to act both locally and conſtitutionally, as well as arſenic. Its local effects are however leſs powerful, deſtroying parts to a leſs extent, and the conſtitutional effects from abſorption are more like thoſe common to the different preparations of mercury than to thoſe of arſenic.

"The actual cautery is at preſent almoſt entirely diſuſed in ſurgery, except in caſes of diſeaſed bones, where it is employed to produce death in the part affected, and in that way, put an end to the diſeaſe. It is a much milder application than either of the above, gives leſs pain while acting locally, and produces no conſtitutional diſturbance; and where it is neceſſary to keep at bay a fungous excreſcence, whoſe growth is not very luxuriant, I ſhould prefer it to the others, from a belief that it does not in the ſame degree hurry on the diſeaſed action of the tumour. In caſes of fungous tumours in the mouth, it is the only means that can be employed; and in an inſtance of that kind, the diſeaſe was kept under for ſeven or eight months, by its occaſional uſe, without much pain being produced, or the diſeaſe being at all advanced in conſequence of the application.

"This account of the effects of cauſtic applications is given in this place, to ſhew in what they differ from the operation by the knife; and when compared with it, what are the diſadvantages, in caſes of cancer; although in other tumours, of a leſs malignant nature, they may be employed with ſucceſs."

### *Deſiderata relating to Cancer and Scirrhus.*

The following inquiries were ſuggeſted by the peruſal of a paper which was printed and diſtributed in the year 1803, by the medical committee of an inſtitution ſet on foot for the relief of perſons afflicted with cancer. The writer of this article, however, has not thought it neceſſary to confine himſelf exactly to the plan which is preſcribed in that paper; but has conſiderably increaſed the number of *queries*, with a view to ſhew readers in general how many difficulties exiſt on a ſubject which certain impoſtors and credulous perſons affect to thoroughly underſtand.

*Query* 1. Is there any peculiar habit of body, or mode of living, in either ſex, which diſpoſes perſons to the formation of cancer, or which enables them to reſiſt its influence?

2. It is well known that at certain periods of life, eſpecially in females, this diſeaſe is frequent in its appearance: on what phyſical cauſes does that liability depend?

3. Are there any means by which the actual formation of a cancer might be prevented, in families where this diſeaſe has ſeemed to be hereditary?

4. Do perſons ever ſuffer in their childhood, or before the time of puberty, from ſpontaneous attacks of cancer?

5. Does a child become cancerous by ſucking a cancerous woman; or could this diſeaſe be produced by transferring the virus from one ſubject to another, in a way of accidental inoculation?

6. Are there any parts of the body exempted from ever aſſuming this diſeaſe; and why do certain organs more frequently become affected than others?

7. Is it clear that the diſeaſe called cancer in ſome brute creatures exactly reſembles this complaint in human beings?

8. Has climate or local ſituation any influence in rendering the human conſtitution more or leſs ſuſceptible of cancer?

9. Do the cancers which ariſe in conſequence of particular employments (as chimney-ſweeping) at all differ in their nature from thoſe which affect perſons under diſſimilar circumſtances?

10. How many kinds or diverſities of cancer are there; and do they all, in their ſeveral ſtages, properly come under the ſame generic appellation?

11. Is there any well marked affinity or relation between cancer and other diſeaſes, in their origin, progreſs, termination, or difficulty of cure?

12. What are the ſpecific differences between ſcirrhus, carcinoma, lupus, noli me tangere, fungus hæmatodes, elephantiaſis, and ſyphilis?

13. Does the exiſtence of a cancer in any one part of the body afford a preſumption that there is a cancerous diatheſis, or tendency to a ſimilar morbid alteration of other parts, in the ſame ſubject?

14. May cancer be regarded at any period of its duration, or under any circumſtances, merely as a local diſorder; i. e. limited to the ſpot which is viſibly affected, and not neceſſarily contaminating (although tending to contaminate) other organs?

15. Has it been incontrovertibly decided, whether external injuries give riſe to cancer in any other way than by rouſing to action a diſeaſe virtually exiſting, or at leaſt which was prediſpoſed to make its appearance?

16. Does this inherent diſpoſition or dormant cancerous tendency imply a morbid change capable of detection, and of being rendered quieſcent by artificial preventive meaſures?

17. In what ſenſe may it be admitted that cancer, or the carcinomatous diſpoſition, is ever hereditary? And are there any well authenticated facts to ſupport this notion, in any other ſenſe than as children may inherit the ſame organization or bodily ſtructure which their parents poſſeſſed?

18. Is it certainly known and proved that one particular conſtitution or temperament of body pre-diſpoſes to this diſeaſe?

19. Is the cancerous matter of a volatile and infecting nature, ſo as to generate this diſeaſe in a healthy perſon, (without real contact) by effluvia in the atmoſphere exhaled from a cancerous ſore; or does it only contaminate by direct abſorption of the virus?

20. Can the eſſential form of any other diſeaſe be ſo changed as to aſſume a carcinomatous ſtate, and finally to degenerate into a cancer.

21. Are there any phyſical ſigns, either local or general, by which we can foretel that more obvious morbid change named cancer; or does there neceſſarily occur any viſible alteration of ſtructure in a part, prior to its being abſolutely affected by this diſorder?

22. Has a genuine and confirmed cancer been cured by art, without extirpating or deſtroying the morbid maſs?

23. What is the ſureſt and moſt effectual method of eradicating cancers of every deſcription?

Cancer is a *Surgical* term alſo applied to a ſpecies of bandage for the head, and divided into ſeveral parts, reſembling the legs of a crab-fiſh.

Cancer, in *Zoology*, one of the genera of apterous inſects in the Linnæan ſyſtem. It is alſo a ſubdiviſion or family of the Linnæan Cancri moulded into a diſtinct genus in the Fabrician Entomologia Syſtematica, and other works of that writer, and a genus of cruſtaceous animals diſtinct from inſects with Cuvier, La Marck, Latreille, Boſc, and others.

Under the generic title of cancer, Linnæus compriſes all the ſpecies of crabs, lobſters, ſhrimps, hermit or paraſitic crabs, and in a word every animal of the true cruſtaceous kind that appears to have been known to him, with the exception only of the two genera *Monoculus* and *Oniſcus*, both which are ſeparated by him from cancer.

Linnæus was induced to conſider the cancri, and the two laſt-mentioned tribes of cruſtacea, as inſects, principally from the circumſtance of their being furniſhed with antennæ, poſſeſſing articulated limbs or legs, and having the body covered with a ſolid cruſt. Being deſtitute of wings theſe are referred to the laſt order of inſects *Aptera*, where they follow the genus Scorpio, and precede the two analogous tribes Monoculus and Oniſcus. That Linnæus was not ſtrictly correct in placing the cancri with inſects, even according to his own definition of the inſect tribe, is evident, but the objections ſo far as they regarded exterior characters were of little conſequence, and after his ſyſtem had become generally known the cancri were admitted without further inquiry as genuine inſects into every entomological cabinet. The French naturaliſts of the preſent day do not, however, conſider them as inſects; but independent of thoſe there are indeed few who, either from accuſtomed habit, or opinion, founded on the Linnæan method, do not acquieſce in conſidering them as a branch of entomology.

From the earlieſt times, in which mankind appear to have diſcriminated with tolerable preciſion the affinity which natural objects bear to each other, and their relative poſition in the chain of nature, crabs and lobſters were ſuppoſed to belong to the piſcivorous tribes of animals, and not to inſects. But they were inattentive to thoſe minutiæ of character which in the preſent ſtate of ſcience we are compelled to have recourſe to; thoſe animals were inhabitants of the waters, and in their ideas muſt of courſe partake of the nature of fiſhes. The Greeks and Romans entertained this notion; they admitted them as a race of creatures ſtrongly allied to fiſhes, and from being covered with a ſhell as forming an intermediate link between fiſhes and the covered or teſtaceous molluſca, or what is commonly underſtood even at this time amongſt us by the name of ſhell fiſh. In this light only they were viewed by ſucceeding generations even till the time of Linnæus, who in his great reform of the animal kingdom thought it neceſſary to ſeparate them entirely from the covered molluſca, and place them among inſects.

How far Linnæus was right in rejecting the eſtabliſhed though vulgar notions that had prevailed among mankind for ſo many ages, remains to be examined. To a curſory obſerver it muſt appear ſtrange, we had almoſt ſaid unphiloſophical, to be told by thoſe to whom they look up for ſcientific information, that crabs and lobſters belong to the ſame claſs of animated beings as beetles, moths, and butterflies. But we are not to be governed by prejudices, nor by the veneration we are too apt to entertain for the knowledge of paſt ages in thoſe matters where our own judgment may be employed with equal or greater certainty; they may really have a natural affinity to each other without being obviouſly ſo in their external characters. Cetaceous animals are called fiſhes by the bulk of mankind, though the naturaliſt is fully ſatisfied they have ſcarcely any other relation to fiſhes than exterior figure, and living in the ſame element. The opinion alſo that crabs and lobſters are inſects, as Linnæus deſcribes them, is ſanctioned by the authority of ſo many writers of ability that we cannot be too cautious in venturing to diſcountenance an opinion ſo well ſupported. It is a matter of diſcuſſion that claims the moſt mature deliberation of the naturaliſt, and fortunately one that has undergone inveſtigation by men well qualified for the taſk, or it would be impoſſible to do it juſtice within the limits of our preſent article. The leading particulars may be explained; and if from the reſult of theſe it ſhould appear that the cruſtacea ought really to be ſeparated from inſects, neither the opinion, nor the example of Linnæus, or his admirers, ſhould deter us from moving them to a more applicable ſtation in the ſcale of zoology. The queſtion is plain, and reſolves itſelf to this point. Is Linnæus correct or not in placing the cancri among inſects? and if he is wrong in this reſpect, not the cancri alone, but the monoculi, and other true cruſtacea, muſt be referred, as well as the cancer genus, to ſome new order or tribe perfectly diſtinct from and independent of entomology.

Were it not for the following characters which the cruſtacea poſſeſs in common with inſects, there are circumſtances attending them that might at once forbid us to place them where Linnæus has. Like inſects they are furniſhed with antennæ, and with limbs divided into joints, and in theſe eſſential particulars approach ſo near the apterous order of inſects, that it would ſeem almoſt as conſiſtent to expunge the whole apterous order from the ſyſtem of entomology as to deprive it of the genus cancer. Theſe reaſons have weight with many, and among others with Fabricius. This writer, to whoſe entomological knowledge we ought not to deny conſiderable praiſe, is a tower of ſtrength on the Linnæan ſide of the queſtion; for like Linnæus he admits the cruſtacea as inſects, although he invariably rejects the Linnæan mode of claſſing them; however therefore he may diſſent from Linnæus in ſyſtematic arrangement, he affords him countenance in the moſt material point under immediate conſideration; namely that the cruſtacea, and of courſe the cancri, are genuine inſects.—But the arguments on the other ſide are alſo ſtrong, and in the minds of ſome may be equally convincing.

It is worthy of remark that our countryman Pennant, a writer, whoſe knowledge of entomology was confeſſedly limited, ſhould be the firſt among modern writers who preſumed to divide the crabs, lobſters, and marine oniſci from the inſect tribes, after the Linnæan Syſtema Naturæ had been generally adopted throughout Europe, and that without having any other motive than a deſire to include thoſe cruſtacea in his Britiſh Zoology. He had but a ſmall acquaintance, as he himſelf expreſſes it, with inſects, and therefore took the liberty of ſeparating the cruſtacea from inſects that he might treat of the former alone. (vid. pref. v. 4. Brit. Zool.) Mr. Pennant was not at that time aware that future naturaliſts might accede to ſuch a ſeparation as he had ſtruck out by accident, from a conviction of its being both natural and juſt; but this has ultimately proved to be the caſe at leaſt to a certain extent.

The idea of cruſtaceous animals being inſects prevailed among the continental naturaliſts from the time of Linnæus till very lately. Cuvier was perhaps the firſt who attended with deciſive accuracy to the internal organizations of thoſe creatures, if we except Zoeſel, whoſe inveſtigations, though laborious, were not well directed. (vid. Inſecten-Beluſtigung, &c.) The reſult of thoſe anatomical obſervations made on them by Cuvier are intereſting. They go far to demonſtrate, or rather they effectually prove, that the cruſtacea, and inſects are perfectly diſtinct from each other. Linnæus, it need be ſcarcely repeated, ſeparated the cetaceous animals, ſuch as whales, porpoiſes, &c. from the fiſh tribe, where they had been previouſly placed by authors, and to which they are ſo cloſely allied in figure and habit, becauſe their internal organization did not accord with that of fiſhes. He proved from the reſult of anatomical obſervations, that notwithſtanding their external form they are of the mammalia tribe, having a heart with two auricles, and two ventricles, blood warm, and lactiferous teats, and for theſe reaſons refers them to the ſame order as man and quadrupeds whoſe internal organization correſponds. The ſame arguments will bear good in this inſtance, and if the remarks of Cuvier are correct, crabs, and various other cruſtacea are certainly not inſects. Cuvier found the interior organization of cruſtaceous animals to be very different from that of inſects. In his "Leçons d'Anatomie Comparée," he affirms that cruſtaceous animals breath and reſpire by means of gills in the ſame manner as molluſca, whereas in inſects the organs of reſpiration are aſcertained from the experiments of Reaumur, Swammerdam, and Malpighi, to be diſtributed along both ſides of the body; the ſmall lateral ſpiracles, which we ſee one on each ſide every annulation of the body of an inſect being the openings, through which the air is received into the tracheal organs; and no ſuch ſpiracles are found on the ſides of cruſtaceous animals. Cuvier likewiſe found that the heart of cruſtaceous animals reſembled that of the molluſca, being muſcular, and furniſhed with veſſels for the circulation of fluids. La Marck in his "Syſtême des animaux ſans invertèbres," follows Cuvier in a ſimilar train of obſervation, and mentions alſo, that although inſects undergo one or more changes, during which they ſeveral times caſt their ſkin, this never happens after the inſect has aſſumed its laſt or perfect form (his *arachnides*, ſome of the Linnæan inſects of the apterous kinds excepted.) Crabs and other cruſtacea, he remarks, do not undergo any ſuch metamorphoſe as inſects; their ſkin or ſhell is of a different nature, being half calcareous, and is renewed at ſtated periods, or annually, the old one being thrown off and another growing in its place. Inſects, it is further obſerved, neither couple nor engender more than once in their lives, which ſeems to be the fact with all (ſome aptera excepted); but the cruſtacea, on the contrary, breed many times in the courſe of theirs. The cruſtacea, as is particularly noticed by Boſc, have many pairs of jaws, and antennæ moſt commonly in greater number than inſects, the latter having never more or leſs than two, while the others have almoſt conſtantly four; and the antennæ of the cruſtacea are alſo of a very different ſtructure from thoſe of inſects. Theſe are the moſt material peculiarities in which the cruſtacea differ from inſects, and which we cannot but allow in our own mind to be ſufficient to juſtify the removal of the cruſtacea for ever from the tribes of entomology. Firmly as we admire the merits of the great Swediſh naturaliſt, we ſhould not preſume to attempt the overthrow of a part of his ſyſtem ſo conſiderable as that under preſent conſideration upon trivial grounds, but the reaſons againſt it are cogent, perhaps unanſwerable. We have ever been taught by Linnæus himſelf to regard the internal organization of animals, as an eſſential and unerring guide in the natural diſtribution of the tribes of zoology; it is by this ſtandard the merit of his methodical arrangement of this tribe has been appreciated, and it has fallen to the ground.

The cruſtaceous tribes, thus ſeparated from entomology, muſt conſtitute a new and diſtinct order of animals. Some difficulty next ariſes as to the ſtation in the ſyſtem to which they ought to be referred. By placing them as a ſeparate order immediately after inſects, the innovation might create the leaſt confuſion; but this is even liable to objection. Cuvier arranges them between the worms and inſects, the worms, in his ſyſtem, contrary to that of Linnæus, occurring firſt. La Marck places them between the molluſca and the *arachnides*, a new claſs, compriſing moſt of the Linnæan *aptera*, (cruſtacea excepted) ſuch as the ſcorpion, pycnognon, ſcolopendræ, and others that have *ſtigmates*, or lateral apertures communicating with the tracheal organs of reſpiration, and which engender many times in the courſe of their lives. Latreille's Tableau Methodique des Cruſtacées is placed between the *annelides* (a claſs of worms,) and the inſects, the latter beginning with the *arachnides* of La Marck. See article CRUSTACEOUS ANIMALS.

To follow the French naturaliſts through the mazes of the various ſyſtems propoſed for the arrangement of the crabs and other cruſtaceous animals, is not within the compaſs of our preſent deſign. Thoſe naturaliſts ſeem only to agree in the one decided point, that *cruſtacées* are not inſects, each having in turn rejected the mode of claſſification adopted by his predeceſſor; ſo that no permanent arrangement has hitherto been formed, or perhaps ever may; and to embrace the whole, ſtill fluctuating even in the unſettled ideas of their own authors, would only tend to create inexplicable confuſion. It will very likely be thought more than ſufficient, by the faſtidious few, that the writer of this article has followed them ſo far. In proceeding further he conceives the propriety of forming a new order, as in the preſent ſtate of things it would be impoſſible to purſue any of thoſe already adopted. That which he propoſes is moulded as nearly as poſſible to the Linnæan method. So far as the plain and ſimple rules of ſubdividing the cancri into families rather than genera, as laid down by Linnæus, could be conveniently adhered to, his example is followed; the principal deviations are in thoſe inſtances where alteration has been rendered neceſſary by the diſcoveries of recent naturaliſts in this tribe of animals, and which are of too much conſequence to be overlooked.

The laſt edition of the Linnæan Syſtema Naturæ compriſes only a ſmall number of the ſpecies of cancer at preſent known: his genus cancer is divided into ſeveral families, in which the whole of his crabs, lobſters, paraſitic crabs, &c. are included. The CANCER genus is thus deſcribed. Legs eight, (rarely ſix, or ten) and two chelate hand-claws, or claws furniſhed with a moveable pincer; feelers ſix, unequal; eyes two, for the moſt part placed on peduncles, elongated, and moveable; mandibles horny and thick; lip triple; tail jointed, and unarmed.—The crabs are ſeparated into two principal ſections, *brachyuri*, crabs with ſhort tails, and *macrouri*, crabs with long tails, both which are again divided into ſeveral families.

The cruſtacea are divided by Fabricius into many genera. The Linnæan cancri form a diſtinct claſs called *agonata*, in the Genera Inſectorum of that writer, and comprehend five genera, namely, cancer, pagurus, ſcyllarus, aſtacus, and gammarus. His agonata claſs, in Entomologia Syſtematica, contains eight genera, crabs, hippa, ſquilla, and galathea being added to the preceding, beſides ſome other families of cruſtaceous animals, as limulus, cymothoa, and monoculus. The ſame author, in a later work than the foregoing Supplementum Ent. Syſt. retains part of the Linnæan cancri together in his new claſs *kleiſtagnatha*, but divides them into many genera, which he names cancer, calappa, ocypode, leucoſia, parthenope, inachus, dromia, dorippe, orithyia, portunus, matuta, hippa, and ſymethis; and in his next claſs *exochnata* includes the remainder of the Linnæan cancri in the genera albunea, ſcyllarus, palinurus, palæmon, alpheus, aſtacus, penæus, crangon, pagurus, galathea, ſquilla, poſydon, and gammarus. La Marck, it is clear, has derived material aſſiſtance from the laſt mentioned work of Fabricius. The ſyſtem he propoſes is very nearly allied to that projected by Fabricius, as will appear on a curſory view of the following ſtatement of La Marck's genera of crabs.

*Cruſtacées pedocles.* * Corps court, ayant une queue nue ſans feuillets, ſans appendices latéraux, et appliquée ſous l'abdomen. *Genera*, crabe, calappe, ocypode, doripe, portune, podophtalme, matute, porcellane, leucoſie, maïa, and arctopſis. * * Corps oblong, ayant une queue alongée, garnie d'appendices ou de feuillets, ou de crochets. *Genera*, albunée, hippe, ranine, ſcyllare, ecreviſſe, pagure, galathée, palinure, crangon, palemon, ſquillæ, branchiopode. And among his *cruſtacées ſeſſiliocles*, * Corps couvert de pièces cruſtacées nombreuſes, are crevette (or gammarus), and chevrolle (caprella).

Latreille, in his Cruſtacées Malacoſtracés, further increaſes the genera of this natural tribe, conſtituting altogether thirty-nine genera of thoſe which Linnæus confines to the ſingle genus cancer.

Several of the above-mentioned recently eſtabliſhed genera we conceive it neceſſary to retain as genera, and others as ſubdiviſions of the cancri family in a more compendious form in the following arrangement.

### CRUSTACEOUS ANIMALS.

### Firſt Order, *Cancri Brachyuri*, Linn.

Head not diſtinct from the thorax; body ſhort, having a naked tail, without lateral appendages, or crochets, and folded under the abdomen.

### Genus CANCER.

Mouth uſually furniſhed with ſix feelers; mandibles thick and horny; eyes two, diſtant, elongated, moveable, and commonly placed on peduncles; antennæ four, ſhort, and filiform, or ſetaceous, the inner pair (or ſometimes both), bifid at the laſt joint; legs eight or ſix, and two chelate claws; body ſomewhat ovate; tail ſhort.

1ſt Section. * *Thorax ſmooth, ſides very entire.*

Species.

GRAPSUS. Front retuſe, deflected, and armed with four; body variegated. Fabr. &c.—This is a native of the Weſt India iſlands, where it is not very common. The colour is whitiſh, variouſly, but moſt elegantly varied with rufous, or red ſpeckled with white, or with minute dottings of red, with a few ſtreaks of the ſame colour on a white ground, the red ſpecklings pervading the whole upper ſurface both of the thorax and legs. The hand-claws are comparatively rather ſmall, rough, and of a red colour, bordered with white; body beneath pale.—Cancer tenuicruſtatus of Herbſt. Cancr. of which he deſcribes and figures a large and ſmall variety (moſt likely the two ſexes), is certainly a variety of the cancer grapſus of Fabricius and Linnæus.

MUTUS. Thorax cheſnut-brown tranſverſely on the anterior margin. Fabr.—A native of the Mediterranean Sea. The poſterior part of the body is truncated; hand-claws ſmooth; arms denticulated beneath.

QUADRATUS. Thorax ſquare; ſides crenated; hand-claws ſcabrous; *Bankſian cabinet.* Fabr.

A native of Jamaica. Size large, exceeding that of cancer ruricola; the front inflected, and entire; eyes placed nearly together, and pedunculated; eye lid beneath crenated; thorax acute at the ſides; hand-claws ſhort; arms toothed at both ſides; hands ſcabrous, with elevated dots; legs hairy; appears allied to the *ocypode* genus.

RURICOLA. Firſt joint of the legs ſpinous; ſecond and third with tufts of hair. Fabr.—Cancer ruricola. Linn.

This is the great land-crab of the Bahama iſlands, the hiſtory of which has been ſo amply detailed by Sloane, Cateſby, Seba, and others, that the following particulars, ſelected chiefly from theſe authorities, may not prove unacceptable. "Theſe animals live not only in a kind of orderly ſociety in their retreats in the mountains, but regularly march once a year down to the ſea ſide, in a body of ſome millions at a time, as they multiply in great numbers. They chooſe the month of April or May to begin their expedition, and then ſally out by thouſands from the ſtumps of hollow trees, which they excavate, from the holes which they dig for themſelves under the ſurface of the earth, clefts of the rocks, and other hiding-places. At that time the whole ground is covered with this band of adventurers; there is no ſetting down one's foot without treading upon them. The ſea is their place of deſtination, and to that they direct their march with the utmoſt preciſion. They never turn to the right or left for any obſtacles that intervene, if they can poſſibly paſs over them, and even if they meet with a houſe they will attempt to ſcale the walls. But though this be the general order of their route, they, upon other occaſions, are obliged to conform to the face of the country, and if it is interſected with rivers they are ſeen to wind along the courſe of the ſtreams, but if only a ſmall rivulet occurs, they force their paſſage acroſs it. The proceſſion ſets forward from the mountains with the regularity of an army under the guidance of an experienced commander. They are ſaid to be commonly divided into three battalions, of which the firſt conſiſts of the ſtrongeſt and boldeſt males, that, like pioneers, march forward to clear the route, and face the greateſt dangers. Theſe are often obliged to halt for want of rain, and to go into the moſt convenient encampment till the weather changes. The main body of the army is compoſed of females, which never leave the mountains till the rain is ſet in for ſome time, and then deſcend in regular order, being formed into columns of fifty paces broad, and three miles deep, and ſo cloſe that they almoſt cover the ground. Three or four days after this, the rear guard follows, a ſtraggling undiſciplined tribe, conſiſting of males and females, but neither ſo robuſt nor ſo vigorous as the former. The night is the chief time of proceeding, but if it rains by day they do not fail to profit by the occaſion; and they continue to move forward in their ſlow uniform manner. When the ſun ſhines and is hot upon the ſurface of the ground, they halt, and wait till the cool of the evening. When they are terrified, they march back in a confuſed diſorderly manner, holding up their nippers. They try to intimidate their enemies by clattering their nippers together, as if it were to threaten thoſe that come to diſturb them. Their diſpoſition is carnivorous, though they moſt commonly ſubſiſt on vegetables; for if any of them by accident are maimed, in ſuch a manner as to be incapable of proceeding, the reſt fall upon and devour it upon the ſpot, and then purſue their journey.

" After a march of ſometimes two, or perhaps three months, in this manner, they arrive at their deſtined ſpot on the ſea-coaſt, and then proceed to caſt their ſpawn. The eggs are as yet within their bodies, and not excluded and retained, as is uſual with animals of this kind, under the tail, for the creature waits for the benefit of ſea-water to facilitate their excluſion. For this purpoſe the crab has no ſooner reached the ſhore than it goes eagerly to the edge of the water, and lets the waves waſh over its body two or three times. This has been thought neceſſary by ſome to ripen the ſpawn in the ovaria, as the crab, appearing ſatisfied with this ſlight bathing, immediately retires, and ſeeks a lodging on the land. After this, they ſay, the ſpawn grows larger, is excluded out of the body, and adheres to the ciliations, or hairs under the tail. This bunch is ſeen as big as an hen's egg, and exactly reſembling the roes of herrings. In this ſtate of pregnancy they once more ſeek the ſhore for the laſt time; and ſhaking off their ſpawn into the water, leave them to the chance of fortune and accident to bring them to maturity. At this time whole ſhoals of hungry fiſhes are at the ſhore in expectation of this annual ſupply; the ſea to a great diſtance ſeems black with them, and about two thirds of the eggs are immediately devoured by thoſe rapacious invaders. The eggs that eſcape are hatched under the ſand; and ſoon after, millions at a time of the little crabs are ſeen quitting the ſhore, and ſlowly travelling up to the mountains. The old ones, however, are not ſo active to return; they have become ſo feeble and lean that they can hardly crawl along, and the fleſh at that time changes its colour. The moſt of them, therefore, are obliged to continue in the flat parts of the country till they recover, making holes in the earth, which they cover at the mouth with leaves and dirt, ſo that no air may enter. There they throw off their old ſhells, which they leave, as it were, quite whole. At that time they are quite naked, and almoſt without motion, for ſix days together, when they become ſo fat as to be delicious food. It is ſaid they have then under their ſtomachs four large white ſtones, which gradually decreaſe in proportion as the ſhell hardens, and when they come to perfection are not to be found. At that time the animal is ſeen ſlowly making its way back; and all this is commonly performed in the ſpace of ſix weeks. This animal, when poſſeſſed of its retreats in the mountains, is impregnable, for only ſubſiſting on vegetables it ſeldom ventures out; and its habitation being in the moſt inacceſſible places, it remains for a great part of the ſeaſon in perfect ſecurity. It is only when impelled by the deſire of bringing forth its young, and when compelled to deſcend into the flat country, that it is taken. At that time the natives wait for their deſcent, in eager expectation, and deſtroy thouſands, but diſregarding their bodies, they only ſeek for the ſmall ſpawn which lies on each ſide of the ſtomach, within the ſhell, of about the thickneſs of a man's thumb. They are much more valuable on their return, after they have caſt their ſhells, for, being covered with a ſkin reſembling ſoft parchment, almoſt every part, except the ſtomach, may be eaten. They are taken in the holes, by feeling for them with an inſtrument; they are ſought after by night, when on their journey, by flambeaux light. The inſtant the animal perceives itſelf attacked, it throws itſelf on its back, and with its claws pinches moſt terribly whatever it happens to faſten upon. But dextrous crab-catchers take them by the hinder legs in ſuch a manner that the nippers cannot touch them, and thus they throw them into their bags. Sometimes alſo they are caught when they take refuge in the bottoms of holes in rocks by the ſea-ſide, by clapping a ſtick to the mouth of the hole, which prevents their getting out: and then ſoon after the tide coming, enters the hole, and the animal is found upon the water retiring, drowned in its retreat.

" Theſe crabs are of various colours, ſome are reddiſh, varied with black, ſome yellowiſh, and others black, inclining to blue. Thoſe of a light colour are eſteemed moſt, and when full in fleſh are well taſted. In ſome of the ſugar iſlands they are eaten without apprehenſion of danger, and form no inconſiderable part of the food of the poor negroes."

PAEDERUS. Thorax oblong, with three teeth in front; eyes large and kidney-ſhaped. Herbſt.

Body ſize of a horſe-bean, yellowiſh, with a ferruginous ſpot in the middle of the thorax.

RESIDUUS. Thorax ſubrotund; front on both ſides emarginate. Herbſt. Muſ. Cæſar Viennenſ.

Body ſize of a ſmall walnut. Colour entirely olivaceous, inclining to fuſcous.

AURANTIUS. Thorax entire at the ſides, and retuſe before; front truncated and emarginated; hand-claws glabrous; legs compreſſed. Herbſt.

Moderately large; general colour duſky orange, or browniſh on the thorax; legs paler and more obſcure, laſt joints furrowed longitudinally.

CORDATUS. Thorax undulated; hand-claws heart-ſhaped below, and muricated. Linn.

A large ſpecies, being ſomewhat larger than the ordinary ſize of our edible, or pound-crab, Cancer pagurus. The prevailing colour of the body teſtaceous brown, inclining to fuſcous; legs pale fuſcous, and ciliated at the edges. Inhabits Surinam.

ORBICULUS. Thorax orbiculate, ſmooth, and flat; beak with three ſhort ſpine-like tubercles. Herbſt. Fabr. &c.

A ſmall ſpecies of crab brought from New Zealand by ſir J. Banks. The ſnout is ſhort and exſerted; thorax ſlightly depreſſed, and ſurrounded with a very entire margin; tail conic; legs ſmooth.

Obſ. Fabr. erroneouſly refers for a figure of it to Herbſt. Cancr. t. 2. 23. that being longicornis, not orbiculus.

LONGICORNIS. Thorax orbiculate, ſmooth, and ſmaller than the hand-claws, ſnout of three obtuſe ſpines; antennæ very long. Linn. &c. Inhabits European ſeas. Found on the coaſt of Angleſea, and Kent. Muſ. Donov. This, like the preceding, is of a diminutive ſize.

CHELATUS. Thorax ovate, ſmooth, leſs than the hand-claws; ſnout ſimple and obtuſe; antennæ very long. Inhabits New Zealand. Muſ. Banks.

This kind has the ſnout inflected and entire; thorax an elevated, acute, and entire margin. Arms large, projecting, and three-ſpined at the tip; hand-claw large, ovate, ſmooth, with incurvated pincers. Antennæ twice the ſize of the body. Poſterior legs filiform, thighs canaliculated.

HEXAPUS. Thorax orbiculate and toothed in front; antennæ longer than the body. Fabr. Linn. &c.

Body rather larger than a pea; hand-claws large; colour pale teſtaceous. Found in European ſeas.

PLATYCHELES. Thorax ſmooth, orbiculate, very entire; hand-claws flat beneath and ciliated; antennæ very long. Herbſt. Penn. &c.

Herbſt deſcribes *Die breitſcheere*, the name by which he calls this crab, as being rare in Europe. His figure is copied from that in Pennant's zoology, upon the authority of which he records it as an Engliſh ſpecies. It occurs chiefly in our country, on the ſouth coaſt of Angleſea. Muſ. Donov.

ANATUM. Thorax ſmooth, globular, crenated, very entire; hand-claws ſhort, pincers two-edged. Herbſt. Die endtenkrabbe.

CANCELLUS. Thorax ſmooth, crenated; margin of the breaſt prominently crenated; hand-claws two-edged; arms crenated. Muſ. Herbſt.

Body roundiſh, about the ſize of a horſe-bean; hand-claws rather long and linear. Colour pale browniſh, dotted with white; claws and legs ſlightly ferruginous.

HISTRIÆ. Thorax ſlightly orbiculate and ſmooth, with two teeth on each ſide; tip between the eyes three-toothed, the middle one largeſt. Scopoli.

SCOPOLINUS. Thorax ſubrotund, ſmooth, ſomewhat convex above; antennæ capillaceous. Herbſt. Nutrix of Scop.

ANTENNATUS. Thorax ſubovate; antennæ three times as long; hand-claws wedge-ſhaped. Forſkael.

PHILAGRUS. Thorax convex, and fifteen-toothed behind. Linn. This inhabits Aſia.

CASSIDEUS. Head ſhielded, emarginated; arms with filiform appendages. Forſter. Gmel.

A native of the Indian Seas. Colour ſubdiaphanous, variegated with ſulphur, orange and green.

TALICUNA. Thorax orbicular and very entire; hand-claws muricated. This crab is four inches in breadth, fuſcous, and becomes red in boiling. Fleſh excellent. Inhabits Chili.

GRANARIUS. Thorax ſubovate, ſmooth, very entire; front cuſpidate; eyes cylindrical. Fabr. Slabber.

A minute ſpecies of moſt extraordinary appearance; hardly larger than a grain of wheat. Thorax ſomewhat ovate, ſnout conſiſting of a thick obtuſe ſpine, having a ſmaller one on each ſide at the baſe; the large tubular or cylindrical eyes are placed behind theſe. General colour pale yellowiſh. Found in the freſh waters of Europe, but rarely.

MINUTUS. Thorax ſmooth, very entire, ſomewhat ſquare, with the edges rather ſharp; legs compreſſed. Linn. Cancer nutrix of Scopoli. Frequent in deep waters.

PUSILLUS. Thorax ſmooth, ſquare, very entire, with a ſingle tooth on the tarſi. Herbſt. &c. Inhabits the North Seas, and is greatly allied to minutus, but is not more than one fourth its ſize, and is therefore extremely ſmall; it is alſo depreſſed and of a pale colour.

** Section. *Thorax ſmooth, and cut at the ſides.*

CORALLINUS. Thorax obovate, one-toothed; front three-lobed. This inhabits India, and exceeds the ordinary ſize of our largeſt Engliſh crab, cancer pagurus. The thorax is of a fine coral red, variegated with a few whitiſh marks, but rather pale towards the poſterior end; legs pale reddiſh; pincers blackiſh.

FLORIDUS. Thorax ſmooth, unequal, ſpotted; margin obtuſely ſerrated; hands creſted. Linn.

Canc. incomparabilis, elegantiſſime pictus. Seba. Inhabits India. The figure in Herbſt. p. 39. pl. 5. repreſents the ſhell of the thorax, which appears to be of a white colour, with many large and ſmall red protuberances.

APANTORA. Thorax ovate, denticulated at the ſides; tail triangular. Molin. Hiſt. Chili.

BISPINOSUS. Thorax ſmooth, and two-ſpined each ſide; front four-toothed; hands muricated, and toothed. Inhabits India. Size moderate; thorax roundiſh; colour dirty brown.

MACULATUS. Thorax with round red ſpots, and one-toothed at the ſides; front three-lobed. A native of Aſia. Seba.

SANGUINEUS. Thorax obſoletely two-toothed on each ſide; front four-lobed; hands black. Inhabits deep waters.

XAIVA. Thorax three-toothed at the ſides; front truncated. Body hemiſpherical, and about two inches and a half broad. Inhabits Chili.

MAENAS. Thorax ſmoothiſh, with five ſerrated teeth at each ſide; front three-lobed; joint next the hands with a ſingle tooth. This is our moſt common crab, the general colour of which is green, variegated with yellow. Inhabits Europe.

QUINQUE-DENTATUS. Thorax ſmoothiſh, with five teeth at each ſide; front four-toothed; joints near the hands ſlightly toothed; tail inflected and narrow. Linn. Muſ. Leſk.

CIMICOIDES. Thorax orbicular, five-toothed each ſide, and truncated before; tail inflected; the third joint longeſt and pointed.

PYGMÆUS. Thorax ſmoothiſh, with five teeth each ſide; front very entire; middle joints of the hands one-toothed.

FASCICULARIS. Anterior part of the thorax tufted with hair; ſides with two teeth. Herbſt. Inhabits the Eaſt Indies.

RUFO-PUNCTATUS. Thorax depreſſed, dotted with rufous; front ſix-toothed, ſides two-toothed; hand-claws and legs ſmooth, dotted with rufous. Herbſt.

General colour rich yellow, with innumerable rufous dots. Rather ſmaller than our common crab, C. mænas.

STRIGOSUS. Thorax ſmooth, ſtreaked tranſverſely on the ſides; behind the eye a ſingle tooth; ſnout deflected, with four tubercles before the tip. Herbſt. &c. Larger than C. rufo-punctatus; prevailing colour brown; hand-claws ſhort; legs long and broad. The claws at the extremity of all the legs appear in the figure by Herbſt, rather cancellate, broad, and ſerrated, or faſciculated at the edges, from which it would ſeem rather to belong to the matuta genus than cancer.

LITTERATUS. Thorax impreſſed with the figure of letter H; ſides three-toothed; claws compreſſed and ciliated. Fabr. &c.

A larger ſpecies than C. grapſus. Prevailing colour brown, darkeſt on the thorax.

PLICATUS. Thorax with an elevated longitudinal diverging plait in the middle; ſides emarginate and dentated; hand-claws and legs ſmooth. Herbſt.

Rather ſmall; general colour pale brown; plaits on the back diverging into ſix rays.

TRISPINOSUS. Thorax unequal, front four-toothed, with three ſpines each ſide; hand-claws inflated, pincers blackiſh. Herbſt.

This is a large ſpecies, the legs expanding about twelve inches; the thorax is nearly quadrangular, and moderate in ſize. Colour pale brown.

Marmarinus. Thorax ſmooth, with a ſingle lateral tooth, white with rufous ſpots; front three lobed; middle one emarginate. Herbſt.

Thorax rufous, elegantly charactered with whitiſh; legs pale yellow; hand-claws with a large rufous ſpot on each joint.

Maculatus. Thorax ſmooth, with a ſingle lateral tooth, yellowiſh with rufous ſpots; front three-lobed, middle one emarginate. Herbſt.

Except in colour, this differs very little from the preceding, and may poſſibly be only a variety of it.

Amphitrite. Thorax tuberculated, with four dilated teeth each ſide; front two-lobed; under ſurface of the hands and pincers fuſcous.

Expands ſeven inches; general colour fine orange faintly ſpotted; legs varied, with indented fuſcous marks. Perhaps a variety of floridus. Muſ. Herbſt.

Daira. Thorax, and upper ſurface of the hand-claws tuberculated; thorax broad, and narrowing anteriorly; ſides crenated with teeth; front with two diſtinct tubercles.

Cancer Daria. Herbſt. Length of the thorax an inch; hand-claws moderate; legs ſhort and ſpinous. Inhabits the Eaſt Indies. Muſ. Donov.

Dodone. Thorax rather unequal; front obtuſe, and two-lobed; ſides compreſſed, ſomewhat emarginate, and toothed; hands and legs carinated; pincers black.

Size of the foregoing; thorax blue above; chelate arms and legs teſtaceous brown.

Metis. Thorax unequal, with ſmooth tubercles; front cleft, with two emarginated lobes; margin with five teeth each ſide. Herbſt.

Smaller than C. dodone; colour pale; legs and arms moderate. Muſ. Donov.

Panope. Thorax convex, granulated; front obtuſe, with granulated margin, and cleft in the middle; ſides four-toothed; pincers of the fore-claws black brown.

Smaller than cancer mænas, and ſomewhat ſimilar in figure; general colour olivaceous; upper ſurface of the hand-claws granulated and red. Herbſt.

Tyche. Thorax unequal, flat, tuberculated with granules; front advanced, obtuſely rounded, and cleft; ſides bidentated with two truncated warts; upper ſurface of the hand-claws tuberculated.

Cancer Tyche. Herbſt. Smaller than the laſt, and of a dirty aſh-colour; the tubercles on the hand-claws orange.

Electra. Thorax unequal, and almoſt flat, tuberculated, and minutely granulated; ſides five-toothed; front four-toothed; hand-claws granulated and dentated; pincers rounded, and blackiſh at the tips. Herbſt.

Petræa. Thorax ſmooth, fuſcous, with yellow ſpots; ſides with a ſingle tooth; front three-lobed. Herbſt.

Pitho. Thorax ſmooth, and very glabrous; ſides with a ſingle tooth; front three-lobed, the middle one emarginate.

Length two inches; colour duſky olive. Herbſt.

Ocyroe. Thorax ſmooth, ſomewhat tuberculated, with fuſcous ocellate dots; ſide with a ſingle tooth; front ſlightly truncated, and furrowed in the middle. Herbſt.

Cymodoce. Thorax flat, depreſſed, nearly ſquare, with a ſingle ſpine on each ſide, ſomewhat truncated in front, and ſix-toothed; inner margin of the arm dentated.

Calypso. Thorax convex, unequal, tuberculated, and granulated; ſides three-toothed; front two-lobed, and granulated; hands granulated, and hiſpid; legs ſetaceous.

Eurynome. Thorax flattiſh, tuberculated, and granulated; four jagged ſpines on each ſide; front with many teeth.

Size moderate, colour reddiſh brown, except on the legs, which are brown faſciated with whitiſh: arms and hands prickly; front of the thorax crenulated, with about thirty teeth. Cancer eurynome. Herbſt.

Polydora. Thorax unequal, ſlightly convex, tuberculated, and warted; hands warted; pincers fuſcous; legs tuberculated with ſpines.

Princeps. Thorax elevated in front; ſides emarginate; diſk ſtreaked tranſverſely with ſeries of ſanguineous dots; legs banded with purple.

About the middle ſize; colour ochræous, dotted, and ſpotted with ſanguineous. Herbſt.

Parvulus. Thorax three-toothed at each ſide, and marked with impreſſed lines above; front entire.

Very ſmall. Inhabits the ſhores of the American iſlands.

Pagurus. Thorax with nine obtuſe plaits at each ſide; pincers of the hand-claw black at the tip.

This inhabits moſt of the rocky ſhores of England, and other countries of Europe, and is ſaid to be in the higheſt perfection for the table about Chriſtmas. The fleſh is much eſteemed, as being more palatable and wholeſome than that of any other kind of crab.

Undecim-Dentatus. Thorax nearly ſmooth, with eleven crenulate teeth at each ſide; proboſcis three-toothed; fingers black at the tip.

A native of America. Thorax rather dilated behind, with crenated or rather ſerrated teeth at each ſide; legs and hand-claws ſomewhat hairy.

Spinifrons. Thorax five-toothed at each ſide; ſecond and third tooth bifid; front and hands many-ſpined. Fabr.

Aeneus. Thorax very rugged, obtuſe, and four-lobed at each ſide.

Inhabits India. The legs are compreſſed, varied with grey and rufous; lip doubled, and dotted with black; thighs with a black ſpot in the middle; hands ſmall.

Ochtodes. Thorax unequal, obtuſely toothed at each ſide; proboſcis bifid; hands warty. Herbſt.

Nearly the ſize of cancer mænas; pale fleſh colour. Thorax with four, five, or ſix obtuſe teeth at each ſide; arms and hands of the fore claw tuberculated.

Lactatus. Thorax with four ſerrated lobes at each ſide; hands ovate and ſmooth. Herbſt.

*** Section. *Thorax hairy, or ſpinous on the back.*

Chabrus. Thorax hairy, ſuborbicular unarmed; hands ovate, and muricated. Linn. Inhabits the Indian Ocean.

Setosus. Hiſpid; thorax obcordate, and tuberculated; ſnout bifid and inflected.

Inhabits Chili. Deſcribed by Molin.

Santolla. Thorax prickly, arched, ſubcoriaceous; hands covered with a pellicle. Molin. Chili.

Cristatus. Thorax prickly; proboſcis projecting, bifid, and creſted; legs prickly. Rumpf.

Germanus. Thorax unequal, with a ſpine on the front, and another above the tail.

Inhabits the German Sea. The body is very minute; front with an ovate plate or lamina between the eyes, terminating in a ſpine; tail round, and conſiſting of five globular joints.

Auritus. Thorax one-ſpined in front, with the back ſulcated and ſoftiſh.

A ſpecies of ſmall ſize that inhabits Iceland. Shell with a ſmall erect ſpine behind the eyes; arms one-ſpined at the baſe and tip; thumb with a ſingle tooth.

Cruentatus. Thorax tuberculated and red; ſnout linear and truncated. Scopoli.

Inhabits the Mediterranean. Body ſpotted with white at the tip; hands oblong, ſmooth, and armed with two teeth, legs warty.

Hepaticus. Thorax ſemicircular, gibbous, and warty; the margin ſerrated. Herbſt. A native of America and India.

Scruposus. Thorax tuberculated and flattiſh; the margin prickly; hands creſted at the inner margin.

Deſcribed by Herbſt as an inhabitant of India.

### Genus Dorippe.

Antennæ four, the exterior ones ſetaceous, interior palpiform; thorax ſomewhat heart ſhaped and wideſt behind; hand-claws two, terminating in pincers; four poſterior legs prehenſile, and uſually folded over the back.

Lanata. Thorax heart-ſhaped, unequal, depreſſed, hairy, and four-toothed in front; tail with ſix teeth at the baſe.

Cancer lanatus, Linn. Cancer quadridens. Fabr. Ent. Syſt. Der. Wollenſchild, Herbſt. Inhabits India.

Facchino. Thorax ſmooth; margin very entire, with eight teeth in front. Der maulaſſe, Herbſt. Pale brown, and twice the ſize of the following.

Mascarone. Thorax ſmooth; margin very entire, with ſix teeth in front. Der maſcarell, Herbſt.

The two laſt mentioned ſpecies have the back of the thorax ſingularly indented with waved lines, that bear the reſemblance of a groteſque human face; colour pale fuſcous.

Frascone. Thorax tuberculated, entire; anterior part lobed and dentated. Herbſt.

Colour browniſh; hand-claws and two poſterior pair of legs hairy; firſt joint of the two anterior pair hairy, the reſt naked.

Astuta. Thorax heart-ſhaped, depreſſed, and hairy; anterior part four-toothed; tail ſmooth. Fabr.

Callida. Thorax heart-ſhaped, depreſſed, naked; front quadridentated; tail carinated. Fabr.

Dromia. Thorax hairy, five-toothed each ſide: four poſterior legs equal.

Dromia Rumphii. Fabr. Suppl. Cancer dromia. Linn. Cancer lanoſus. Rumpf.

Aegagropila. Thorax globular, unarmed, and very hirſute; pincers naked, and dentated within.

Dromia aegagropila. Fabr. Suppl.

Artificiosa. Thorax downy, depreſſed, three-toothed at each ſide; poſterior legs large.

Dromia artificioſa. Fabr. Suppl. Inhabits the Indian Ocean.

Obſ. There is reaſon to apprehend that ſeveral ſpecies of crabs deſcribed on the authority of naturaliſts in the genus cancer belong rather to this genus or family.

### Genus Portunus.

Antennæ four, unequal, ſmall, and jointed; the exterior ones ſetaceous and longeſt, interior palpiform; body large, ſhort, and dentated at the edges. Legs ten, the poſterior pair terminated in an ovate plate, or ſwimmer.

† Diviſion. *Thorax bidentated at each ſide.*

Vigil. Thorax ſmooth; arms ſpinous. This is a native of the Indian Ocean. Size moderate, eyes approximate, and ſituated upon very long peduncles; anterior tooth on the thorax much longer than the poſterior one.

†† Diviſion. *Thorax with four teeth at each ſide.*

Peymea. Thorax depreſſed and flat; front truncated and plaited. A ſmall ſpecies of a pale browniſh colour, thorax tinged with red.

††† Diviſion. *Thorax with five teeth on each ſide.*

Puber. Thorax heart ſhaped, and hairy; hands with a ſingle tooth, and tipped with black.

Cancer Puber, Linn. Larger than cancer grapſus, and inhabits the Mediterranean. Front with three obtuſe crenated teeth; ſhells rugoſe of a brown colour with rufous heir.

Feriatus. Thorax ſmooth; hands ovate, multangular, the ſecond joint of the arms with a ſingle tooth. Inhabits the Indian Sea. Cancer Feriatus Linn.

Depurator. Thorax ſmooth; hands compreſſed at the tip.

Cancer Depurator, Linn. Cancer Ramipes, Barrel.

Lancifer. Thorax ſlightly tuberculated with a ſingle ſpine on each ſide, and four teeth in front; anterior legs lineate.

Diſcovered in the Pacific Ocean. Muſ. Banks. Thorax ovate, with ſix tubercles on the back; hands with ſpinous protuberances, the pincers toothed within; thighs of the firſt ſix legs toothed on the inner margin, the laſt joint but one with a ſharp and long ſpine before the tip, the laſt lanceolate and acute; plate of the poſterior legs roundiſh, obtuſe, and ciliated.

Holsatus. Thorax ſmoothiſh, with five teeth in front between the eyes. Size and form of Depurator. Inhabits European ſeas. Muſ. Daldorff.

Rumphii. Thorax ſmoothiſh, with four tuberculate teeth in front; hand-claws ſmooth. Herbſt.

Lassinassa. Thorax unequal, attenuated behind; front advanced, and three toothed. Herbſt.

Velutinus. Thorax three-lobed in front; velvety; hands granulated; legs velvety and furrowed.

Larger than Cancer mænas; colour brown. Muſ. Donov.

Admete. Thorax flat, with crenated tranſverſe lines, and truncated in front; fourth lateral tooth ſmalleſt. Herbſt.

Half the ſize of Cancer mænas, broad, pale brown; fingers of the hands black at the tip.

†††† Diviſion. *Thorax with ſix teeth on each ſide.*

Crucifer. Thorax ſomewhat ſmooth; with eight teeth in front; laſt of the ſix lateral teeth emarginate.

Found in the Indian ſeas. Size large; frontal teeth obtuſe; colour rufous with a croſs in the middle, and lateral ſtripe white. Muſ. Donov.

Lucifer. Thorax ſomewhat ſmooth; front with eight teeth; fingers rufous and black at the apex. Inhabits the Indian Ocean. Daldorff. Colour rufous or reddiſh with four large white ſpots. Shines by night.

Annulatus. Thorax ſmooth; front with eight teeth; legs annulated with violaceous.

Inhabits the Indian Ocean. Smaller than lucifer, ſmoothiſh, and duſky, hand-claws ſpinous, pincers red, a white band in the middle, end black with white tip. All the legs variegated with violaceous and white. Fabr. &c.

Variegatus. Thorax heart-ſhaped, pubeſcent, back tooth of the thorax large; front with eight teeth; hands ſpinous. Fabr.

Bears a ſtrong reſemblance to the following ſpecies, but is ſmaller; and has the thorax rugoſe, the poſterior ſpine longer, and the fingers white. Both are inhabitants of the Indian ſeas, and deſcribed from Daldorff's Muſeum.

Holosericeus. Thorax heart-ſhaped, pubeſcent, front eight-toothed; hands ſpinous.

Truncatus. Thorax heart-ſhaped, pubeſcent, truncated in front, and eight-toothed.

Nearly allied to the two former, but differs in having the thorax broader, truncated in front and all the teeth ſmaller and more obtuſe.

Fasciatus. Thorax in front eight-toothed; legs banded with purple; pincers ſcarlet. Herbſt.

Callianassa. Thorax ſix-toothed; hands ſpinous, and papillous at the angles. Herbſt. Colour uniform dirty olivaceous brown.

††††† Diviſion. *Thorax with eight teeth on each ſide.*

Menestho. Thorax downy, truncated, and four-toothed in front, poſterior lateral tooth large; arms of the fore-claws ſpinous. Herbſt.

A large ſpecies; thorax above ochraceous brown, legs ſame paler.

†††††† Diviſion. *Thorax with nine teeth on each ſide.*

Tranquebaricus. Thorax ſmooth, with four teeth in front; arm dentated. Fabr.

A native of Tranquebar. This kind is eaten in the Eaſt Indies. The thorax is glabrous. Muſ. Daldorff.

Pelagicus. Thorax ſmooth; poſterior tooth large; hands multangular.

Found among ſea weeds. Degæer. Cancer pelagicus. Linn. Colour pale yellowiſh brown; fore-claws long, firſt joint ſpinous.

Sanguinolentus. Thorax ſmooth; poſterior tooth very large, and three ſanguineous ſpots on the thorax. Herbſt. Der Blutfleck.

Commonly confounded with pelagicus, but certainly a diſtinct ſpecies: it has three red ſpots on the back of the thorax, and one on each hand, by which it may be readily known. Pelagicus is ſmaller, the thorax more rounded; poſterior ſpine ſlender, and outline very diſſimilar.

Defensor. Thorax ſmooth; poſterior tooth ſhort; front four-toothed, middle ones very ſhort.

Cancer defenſor. Fabr. Ent. Syſt. Inhabits the South Seas. Muſ. Banks.

Hastatus. Thorax rugoſe; poſterior tooth large: front four-toothed; teeth equal.

A native of America. Muſ. Pflug. and Muſ. Donov.

Armiger. Thorax ſomewhat ſmooth; poſterior tooth large; front five-lobed; arms dentated on both ſides.

Diſcovered in the South Seas. Muſ. Banks. Cancer armiger. Fabr. Ent. Syſt.

Gladiator. Thorax downy; poſterior tooth large; hands ſpotted with ſanguineous. Daldorff. Inhabits the Aſiatic ſeas.

Reticulatus. Yellow reticulated with green; thorax four-toothed in front; poſterior lateral, tooth very long.

Cancer reticulatus. Herbſt. Above the middle ſize; prevailing colour yellowiſh; fore-claws reticulated reddiſh, fingers red. This is a moſt elegant ſpecies.

Forceps. Thorax ſmooth; poſterior lateral tooth largeſt; fingers very long and filiform. Fabr. &c.

Rather ſmall, and entirely of a pale bluiſh green colour. Herbſt.

Ponticus. Thorax rugoſe; poſterior lateral tooth large; hands filiform, fingers ſhort. Fabr.

Smaller than cancer mænas; colour pale brown. Muſ. Donov.

Cedo-nulli. Thorax ſmooth, punctured; poſterior lateral tooth large; front dentated and emarginate, green with yellow ſpots; hand-claws elongated and multangular. Herbſt.

This appears both in ſize and other particulars ſo nearly allied to portunus reticulatus, that they may be conſidered almoſt as varieties of the ſame ſpecies.

Hastatoides. Thorax downy; poſterior tooth large with a ſingle ſmall tooth each ſide behind. Inhabits the Indian Ocean.

††††††† Diviſion. *Thorax oblong-ovate, with three or more nearly equi-diſtant ſpines along each ſide.*

Mammillaris. Thorax ſomewhat aculeated and obtuſe, with a three-ſpined lobe in front; on each ſide a diſtinct rufous mammillated ſpot. Muſ. Donov.

Fabricius conſtitutes a new genus of this ſpecies in his Suppl. Ent. under the name of orithyia. It is the only ſpecies of this genus known.

* Section. Matuta.

Antennæ commonly four, the inner pair of four joints, with the laſt joint bifid, the two exterior ſhort, and ſcarcely viſible; the hand-claws armed with pincers; all the legs terminating in an ovate plate or ſwimmer.

Victor. Thorax dotted all over, lateral margin ſubdentated, the poſterior tooth very large.

Cancer lunaris, Rumpſius and Herbſt. Inhabits the coaſts of Malabar. General colour yellowiſh. Size larger than C. mænas. Muſ. Donov.

Planipes. Poſterior part of the thorax ſtriated. This inhabits the Indian Sea. Muſ. Daldorff.

### Genus Calappa.

Antennæ four, nearly equal; exterior ones ſetaceous; interior of four joints, the laſt bifid; body ſhort, enlarged behind; margin much dilated, and concealing the legs when folded; legs eight, terminating in claws; hand-claws two, hands compreſſed, and armed with pincers.

Fornicata. Thorax ſmooth, crenulated; poſterior dilated, angles very entire; hands creſted.

Inhabits the American Ocean. Cancer calappa of Linn. and Fabr. Ent. Syſt.

Tuberculata. Thorax tuberculated, and many toothed, poſterior dilated angle with crenated teeth; hands dentated.

Diſcovered in the Pacific Ocean. Muſ. Bank. Cancer tuberculatus, Fabr. Ent. Syſt. The thorax of this ſpecies is gibbous, with many tubercles and two impreſſed lines; ſnout ſhort, obtuſe, and ſomewhat reflected at the margins; legs ſimple, fingers ſtriated, and red at the tip; ſecond joint of the hands tuberculated and acute; hands tuberculated.

Granulata. Thorax ſomewhat ſmooth and crenated; poſterior dilated margin five-toothed; hands creſted.

Cancer granulatus, Linn. Inhabits the Mediterranean. This is a large ſpecies, of a pale yellowiſh, or cream colour, with ſeveral obtuſe roundiſh tubercles, of a reddiſh colour, on the fore part of the thorax, and a few on the under ſide of the hands.

Marmorata. Thorax ſomewhat plaited, with three teeth on each ſide; front crenated and emarginated; arms dilated and toothed at the tip.

Lophos. Thorax ſlightly plaited, and crenated on both ſides; hind-margin dentated, and ſix toothed, the poſterior angles dilated and five-toothed each.

Cancer lophos, Muſ. Herbſt. Inhabits the Eaſt Indies.

Cristata. Thorax ſlightly plaited, and crenated on both ſides; hind-margin with ſeven teeth; dilated poſterior angle with three-teeth; hands creſted and toothed. Inhabits China. Muſ. Donov.

Angustata. Thorax ſmooth, crenated on both ſides with teeth, the poſterior one narrow and ſmooth. Inhabits America. Muſ. Lund.

Gallus. Anterior half of the thorax tuberculated; both ſides crenated and dentated; the poſterior dilated angle ſix-toothed; hands tuberculated above. Herbſt.

### Genus Leucosia.

Two or four antennæ, ſmall, quadriarticulate, and inſerted between the eyes. Body ſuborbicular, more or leſs convex, and generally inflated; tail naked; legs eight, and all furniſhed with claws; hand claws two, terminating in pincers.

### Species.

### Diviſion † *with ovate hands.*

**Scabriuscula.** Thorax depreſſed and ſcabrous, front emarginate.

The body of this ſpecies is ſmall, depreſſed, and rough, with elevated whitiſh dots. This inhabits India.

**Globosa.** Thorax ſlightly crenated; tail with two tubercles at the baſe; arms rough. Fabr. A curious ſpecies, diſcovered on the coaſt of Malabar by Dr. Koenig. Its ſize is ſmall, figure ſomewhat globoſe; arms rough, hands filiform. Herbſt deſcribes it under the name of *Die kugelkrabbe*, Cancer globus.

**Craniolaris.** Ovate, very glabrous, or poliſhed; anterior part projecting, and armed with three teeth; hands two-edged and ſmooth. Linn. Die Hirnſchaalkrabbe, Herbſt.

Body about the ſize of a ſmall walnut, or rather leſs, the colour bluiſh, ſlightly tinged with faint red and purpliſh, the claws are of the ſame colour, except the pincers, which are pink; legs browniſh. This inhabits the ſhores of Malabar. Muſ. Donov.

**Porcellanus.** Thorax very glabrous, or poliſhed, ovate, obtuſe at the anterior part; arms granulated. Fabr. *Die porcellankrabbe*, Cancer porcellaneus, Herbſt.

This ſpecies is about the ſame ſize as the preceding, and ſomewhat reſembles it in form, but has the anterior part obtuſe, and without teeth; the lateral margins of the thorax are granulated; general colour pale brown, with the two extreme joints of the hand-claws bluiſh. Inhabits Tranquebar. Muſ. Donov.

**Pila.** Thorax globoſe, with a ſingle obtuſe elevated tooth in the middle, and the margin crenated with teeth.

Inhabits India. The body is ſmall, globular; front obtuſe; hand-claws ſhort and ſmooth.

**Planeta.** Thorax orbicular and flat; ſides bidentated; front with three teeth.

This is a minute ſpecies, and inhabit Terra del Fuego.

**Urania.** Globoſe, highly poliſhed; anterior part projecting and roundiſh; arms warted, hands ſmooth. Herbſt.

An elegant kind of crab, nearly allied to Cancer craniolaris in figure, but above twice the ſize. The body and hand-claws are olivaceous, with ſome obſcure rufous ſpots: from the tip of the ſnout a broad white ſtripe deſcends nearly to the centre of the thorax, where it ends in a bifid termination. The pincers of the hand-claws, and all the legs are yellow ſpotted with ferruginous.

### Diviſion †† *with filiform hands.*

**Punctata.** Thorax ovate, crenated, and three-toothed behind; fingers unarmed.

Inhabits America. Body large, ovate, and rough, with elevated dots; hand-claws long, filiform, and the arms granulated; hands elongated, fingers unarmed. Muſ. Donov.

**Fugax.** Thorax oblong, three-toothed behind; middle tooth longeſt and recurved; fingers dentated.

Frequently confounded with the preceding ſpecies, but is certainly diſtinct. Muſ. Donov.

**Nucleus.** Thorax orbiculate, with two ſpines behind; arms granulated.

Cancer nucleus, Linn. Inhabits the Mediterranean. Muſ. Donov.

**Septemspinosa.** Thorax with an elongated and very acute ſpine on each ſide; five ſpines behind.

Cancer hytrix, Fabr. Ent. Syſt. Inhabits the Indian Ocean.

**Cylindricus.** Thorax with two furrows; ſides dilated, cylindrical, and ſpinous at the tip.

Inhabits Tranquebar. This is of a ſmall ſize; front obtuſe, and grooved in the middle; thorax with two large grooves, and a tranſverſe one on the fore part, all hairy; ſides of the thorax whitiſh, with red dots, rough, and armed at the tip with a ſtrong acute ſpine; tail whitiſh, and rough, with two longitudinal grooves in the middle; legs and arms very thin. Fabr. &c.

**Erinaceus.** Thorax ovate and very ſpinous; marginal ones longeſt and dentated; arms prickly.

Deſcribed from the cabinet of Spengler, by Fabricius, as an inhabitant of the Indian Sea.

### Genus Ocypode.

Antennæ four (ſometimes two), very ſhort, and unequal; peduncles of the eyes lengthened, inſerted in a central projection of the head, and extending along the front to the lateral angle of the thorax; body almoſt ſquare; legs ten, armed with claws, the anterior pair, or arms, terminated in pincers.

**Ceratophthalma.** Thorax dotted; eyes prominent, and terminated in a ſpine.

Cancer curſor, Linn. Cancer ceratophthalma, Fabr. Ent. Syſt. and Pallas, and Cancer curſor of Herbſt and Gmelin. This is a ſpecies of moderate ſize, being rather larger than Mænas, that inhabits the Mediterranean and Indian ſeas, from whence, about ſun-ſet, it comes up the ſhores, and wanders about the ſtrand, running at intervals with great velocity. The right claw is commonly larger than the other; both are ſcabrous, as alſo are the legs, though only in a ſlight degree. The general colour is brown.

Fabricius ſuppoſes the two ſpecies, Curſor and Uca, of Linnæus, to be both of this kind, the latter being only an accidental variety, in which the thorax is marked with a rude figure, ſomewhat reſembling the letter H.

**Heterochelos.** Thorax granulated; hand of one arm much larger than the other.

Cancer vocans, Linn. Cancer vocans major, Herbſt. O. Heterochelos, La Marck. Inhabits Jamaica, where it conceals itſelf under ſtones, and when caught, emits a kind of cry. Size of our common crab, Cancer Mænas.

Obſ. Herbſt has the figure of another ſpecies nearly allied to the above; in form the ſame, but not above one fourth of the ſize. This he calls Cancer vocans major; perhaps the young, or a variety of the preceding, Cancer minor paluſtris, heterochelos of Plumier. M. S. G.

**Quadrata.** Thorax ſmooth; crenated at the ſides; hands ſcabrous. Inhabits Jamaica. Muſ. Banks. Cancer quadratus, Fabr. Syſt. Ent.

**Rhomboides.** Thorax ſmooth; lateral angle armed with a ſpine in front. Cancer rhomboides, Linn. Das Würfelſchild, Herbſt.

Colour pale browniſh; arms long, and ſhaded with rufous. Muſ. Donov.

**Angulatus.** Thorax ſmooth; oblong, with two ſpines at the anterior part of the lateral angle. Cancer angulatus Linn. Ocypoda biſpinoſa, La Marck. Muſ. Donov.

**Lævis.** Thorax ſmooth, with a ſingle tooth at each ſide; hand-claws very ſmooth, right hand largeſt. Inhabits the Indian Sea. Daldorff. Fabr. Suppl.

**Minuta.** Thorax ſmooth, with a ſingle tooth at each ſide; hand claws very ſmooth and equal. Inhabits the iſle of France. Muſ. Daldorff, Fabr. Suppl.

**Brevis.** Thorax ſhort, plaited, with three teeth at each ſide; hand-claws long. Herbſt. Suppl.

Moderately ſmall, colour in general pale brown. Muſ. Donov.

Vocator. Thorax rugoſe, anterior part ſinuous; right hand very large. Herbſt. Suppl.

Body ſomewhat gibbous at the ſides, and narrowing rather behind; colour of the thorax; left hand-claw, and firſt joints of the legs dark red, the firſt variegated with black; largeſt claw, and extreme joints of the legs pale browniſh. Muſ. Donov.

### Genus Maja.

Antennæ four, the interior ones palpiform, exterior ſetaceous; body oval and ſubconic, much enlarged behind, and narrowing towards a point in front; legs eight, armed with claws; hand-claws terminated in pincers.

### Species.

* Section. Parthenope, Fabr. *Arms of the chelate-claws uſually very large.*

Giraffa. Thorax ſpinous, ſpines ramoſe; hand-claws very long and tuberculated beneath. Inhabits the Eaſt Indies. Muſ. Daldorff.

Longimana. Thorax ſpinous, ſpines ſimple; hand-claws very long and ſmooth beneath.

Cancer longimanus, Linn. A native of Aſiatic ſeas. Muſ. Donov.

Regina. Thorax unequal; margin ſpinous; hand-claws very long, with ſpinous angles. An inhabitant of the Indian ſea.

Horrida. Thorax rugged with prickles and tubercles; hands large, tuberculated, and ſomewhat ovate; tail carious. Inhabits the Aſiatic ocean. Called by *Rumpſius* Rotſkrabbe, Die Schreckliche, Herbſt. Great warty Crab of *Petiver*. Muſ. Donov.

Lar. Thorax unequal, four toothed; margin ſpinous; hand-claws ſmooth. This is a native of the Eaſt Indies. Muſ. Daldorff.

Eriocheles. Thorax aculeated, hands ventricoſe, and ſpinous; fingers tufted with hairs. Cancer Eriocheles of Olivier.

Cancer maja, Linn. Parthenope maja, Fabr. Inhabits the northern parts of Europe, and England. Muſ. Donov. Miſtaken by Pennant for Cancer Horridus. This is a large ſpecies.

Dubia. Thorax ſmooth, three toothed in front; hands compreſſed, and ciliated; poſterior legs very ſhort and dorſal. Inhabits the Indian Sea.

Muricata. Thorax hairy, unequal, with a dorſal line and two dorſal ſpines on each ſide; marginal ſpines four; legs hairy.

Cancer muricatus, Fabr. Ent. Syſt.

Contrarius. Thorax very unequal, tuberculated, and ſpinous, the front projecting and pointed; hand-claws muricated; legs ſimple, and banded with rufous. Herbſt.

Body three inches in length, hand-claws ſix inches long and very large; colour pale brown in general, tips of the pincers of the fore-claws black.

Echinatus. Thorax heart-ſhaped, warted, aculeated; arms and hands of the chelate-claws echinated; legs muricated. Muſ. Donov.

* Section. Inachus. Fabr. *Arms of the chelate-claws uſually ſhort or moderate.*

Hybrida. Thorax hairy, unequal, with a dorſal line, and two dorſal ſpines; marginal ſpines four; legs naked at the tip.

Inachus hyridus. Fabr. Suppl. Very much reſembles the foregoing, but is diſtinct. Inhabits India.

Ovis. Thorax ovate, hairy, with four ſpines each ſide. Cancer ovis Fabr. Ent. Syſt. Inachus Ovis Suppl. Cancer hircus, Herbſt. Inhabits the Eaſt Indies.

Hircus. Thorax woolly, tuberculated; arms muricated; hands ſmooth.

Cancer hircus, Fabr. Syſt. Ent. Inachus hircus, Suppl. Inhabits Jamaica.

Cornuta. Thorax prickly; ſnout with two horn-ſhaped bearded ſpines; hands rounded. Inhabits the Mediterranean ſea. Cancer cornutus, Linn. Inachus cornutus, Fabr. Suppl.

Araneus. Thorax unequal; margin crenated on both ſides; anterior part dilated and acute.

Opilio. Thorax prickly; margin three-toothed behind; hands ſomewhat ſmooth.

In the cabinet of Prof. Vahl. Inhabits the Mediterranean.

Condyliatus. Thorax ovate and prickly; three erect ſpines above the tail; hands muricated.

Size of Cancer Araneus or larger. Thorax unequal, many-ſpined; three large tubercles on the dorſal ſpine behind; thighs armed with a ſpine before the tip. Inhabits the Mediterranean.

Aculeata. Thorax covered with prickles; ſnout long, bifid; five-toothed above, and one beneath. Inhabits the Norway ſeas. Muſ. Vahl.

Chiagra. Thorax tuberculated, unequal; ſnout flat, retuſe; legs tuberculated. Muſ. Donov.

A native of the Mediterranean. Inachus chiagra. Fabr. Suppl.

Angustata. Thorax attenuated in front, and ſmoothiſh; ſnout projecting, bearded, and emarginate at the apex. Inhabits the Eaſt Indies. Body minute; thorax ſmoothiſh with entire margin; legs ſpinous; hand-claws ſhort, hands ſmoothiſh, the reſt ſpinous.

Scorpio. Thorax pubeſcent, with four erect ſpines; anterior legs very long.

Cancer Scorpio, Fabr. Ent. Syſt. Inachus Scorpio, Fabr. Suppl. A native of the European ſeas, chiefly Norway, rarely England. Muſ. Donov.

Phalangium. Thorax pubeſcent, with three acute ſpines on the anterior part, obtuſe tubercles behind; ſnout bifid.

Common in Northern ſeas; frequent on the coaſt of England.

Longirostra. Thorax prickly, projecting, aſcending, ſnout acute and bifid.

Cancer longiroſtris, Fabr. Ent. Syſt. Cancer dodecos, Linn. A native of the Mediterranean and Northern ſeas.

Longipes. Thorax prickly; hands ovate and ſcabrous; poſterior legs very long.

Cancer Longipes, Linn. A native of the Indian Ocean. Rumpf.

Seticornis. Thorax ovate, ſmooth, ſnout very long, and ſerrated on both ſides. Herbſt.

Planissima. Thorax quite flat, and nearly ſquare, with five teeth on each ſide, front trifid with ſpines; inner margin of the thighs, and firſt joint of the hand-claws dentated. Herbſt.

Hirticornis. Thorax heart-ſhaped, unequal, dentated; front with two long, approximate, hirſute ſpines.

Thorax about the ſize of a ſmall walnut; legs moderate, chelate; claws nearly the ſame ſize as the anterior pair of legs, or rather leſs; the whole ſlightly ſpinous, ſomewhat hairy, and of a fuſcous colour. Muſ. Donov.

Dama. Thorax ovate, and granulated, with ſeven ſpines on each ſide; front with two ramoſe ſpines of three branches; arm and joint below the hands of the chelate claws very ſpinous. Herbſt.

Length of the body three inches: legs, and chelate claws moderate; thorax brown; hand claws pale brown; legs blackiſh. Muſ. Donov.

Cornudo. Thorax ovate, unequal, with four ſpines at each ſide; front four-ſpined, the interior pair very long. Herbſt.

From three to four inches long: hand claws filiform, arms four-toothed: thorax paliſh, olivaceous: legs darker. Muſ. Donov.

Squinado. Thorax obovate, unequal, prickly with lateral ſpines; front bifurcated; chelate claws moderate and filiform, arm and joint below the hand prickly; legs unarmed. Muſ. Donov.

Cancer Squinado. Herbſt. Inhabits European ſeas, and is a large ſpecies.

Philyra. Thorax ſubovate, granulated, and unequal; ſnout very large, broad, ſquare, and four-toothed in front; hand-claws ſmall and glabrous. Herbſt.

Rather ſmall, length one inch and a quarter, colour pale, legs faint yellow, ſpotted obſcurely with reddiſh.

Thalia. Thorax ovate and granulated; ſides ſpinous; front truncated, with two acute incurvated ſpines; hand-claws very ſmall.

Length almoſt two inches; prevailing colour ferruginous; hands black or blackiſh.

Cervicornis. Thorax ſomewhat ovate and tuberculated; anterior part much advanced, and armed with four long curved, horn-like ſpines.

Plejone. Thorax conic, tuberculated and ſpinous, with two long ſpines in front; hand-claws and legs unarmed. Herbſt.

This is about an inch and a half in length; thorax pale brown, the two anterior ſpines approximate at the baſe, and curving a little to the ſides upwards; legs pale fuſcous, the firſt pair longer than the chelate claws.

Styx. Thorax ovate, ſubconic, warted, ſnout ſimple, and forked at the apex; anterior pair of legs thick, and hiſpid. Herbſt.

Half the ſize of the former; hand claws very ſmall; colour brown, paleſt on the thorax.

### Crustaceous Animals.

### Second Order. *Cancri Macrouri.* Linn.

Head not diſtinct from the thorax: thorax oblong, with an elongated tail, furniſhed with lateral appendages or crochets.

### Genus Astacus.

Antennæ pedunculated, unequal, the exterior ones long and ſetaceous, inner pair divided at the extremity; body elongated; legs commonly ten; tail foliaceous.

### Species.

Section*. *Inner pair of antennæ two-cleft or bifid.*

Gammarus. Thorax ſmooth; proboſcis toothed at the ſides, with a double tooth on each ſide, at the baſe; hands ſmooth.

Cancer gammarus. Linn. Aſtacus Marinus. Fabr.

This is the common lobſter, a ſpecies frequent in all the northern parts of Europe. It is moſt abundant with us in the northern extremity of Scotland, but is far more frequent than even there on the coaſt of Norway. In a general point of view we can add little to the hiſtory of the lobſter beyond what has been already related by Mr. Pennant, upon the authority principally of Mr. Travis of Scarborough, and of which we ſhall avail ourſelves in this place.

The lobſter inhabits, ſays Mr. Pennant, all the rocky ſhores of our iſland, but chiefly where there is a depth of water. In Llyn in Caernarvonſhire, a certain ſmall lobſter, nothing different, except in ſize, burrows in the ſand. In addition to this we muſt obſerve that the largeſt lobſters we have ever ſeen, ſome few from the coaſt of Scotland excepted, were taken in the lobſter traps within a ſhort diſtance of that part of Caernarvonſhire mentioned by Mr. Pennant, and though ſo very large their flavour was delicious.

Lobſters are brought in vaſt quantities from the Orkney iſlands, and many parts of the eaſtern coaſts of Scotland to the London markets; (but the metropolis is alſo well ſupplied with lobſters at moſt ſeaſons of the year from the coaſt of Norway, and theſe latter are in more eſteem for the table than the Scottiſh kind). Mr. Pennant mentions in his tour in Scotland, in 1772, that ſixty or ſeventy thouſand lobſters are annually brought to London from the neighbourhood of Montroſe alone. Lobſters fear thunder, and are apt to caſt their claws on a great clap; it is ſaid they will do the ſame on the firing of a great gun, and that when men of war meet a lobſter boat, a jocular threat is uſed, that if the maſter does not ſell them good lobſters they will ſalute him. When irritated, or in fear, the lobſters frequently throw off their claws, and the ſame happens commonly when thoſe poor animals are plunged into the boiling-pot for dreſſing. When firſt caught, if taken or entangled only by the claw, they will throw it off with a ſudden jerk, and ſo effect their eſcape.

The habitation of this ſpecies, as Mr. Pennant tells us, is in the cleareſt water, at the foot of rocks that impend over the ſea. This has given opportunity of examining more cloſely into the natural hiſtory of the animal than many others, who live in an element that prohibits moſt of the human reſearches, and limits the inquiries of the moſt inquiſitive. Lobſters are found on moſt of the rocky coaſts of Great Britain. Some are taken by the hand, but the greater quantity in pots, a ſort of trap formed of twigs, and baited with garbage; they are formed like a wire mouſe-trap, ſo that when the lobſters get in, there is no poſſibility of returning. Theſe are faſtened to a cord ſunk into the ſea, and their place marked by a buoy. They begin to breed in the ſpring, and continue breeding moſt part of the ſummer. They are highly prolific. Dr. Baſter ſays he counted 12,444 eggs under the tail of one female, beſides thoſe that remained in the body unprotruded. The eggs they depoſit in the ſand, where they are ſoon hatched. Lobſters change their ſhell annually like other cruſtaceous animals. Previous to their putting off their old one they appear ſickly, languid, and reſtleſs. They totally acquire a new coat in a few days after caſting off the former one. During the time that they remain defenceleſs they ſeek ſome very lonely place, for fear of being attacked and devoured by ſuch of their brethren who are not in the ſame weak ſituation. The circumſtance of the reproduction of the claws in lobſters, though ſurpriſing, is ſufficiently well known: lobſters, as well as crabs, will renew their claws, if by accident they are torn off, within the ſpace of a few weeks after the miſchance has happened. They are very voracious animals, and feed on ſea-weed, garbage, dead bodies, and ſimilar filth.

Mr. Travis communicated ſome intereſting particulars relative to the hiſtory of the lobſter from a variety of obſervations made by himſelf on the coaſt of Scarborough. Lobſters, he obſerves, are found in vaſt numbers, and very fine, upon that coaſt. The larger ones are in general in their beſt ſeaſon from the middle of October till the beginning of May. Many of the ſmall ones, and ſome few of the larger ſort, are good all the ſummer. They are, in general, from four to four inches and a half from the tip of the head to the end of the back ſhell. Commonly the pincers of one of the lobſter's large claws are furniſhed with knobs, and thoſe of the other claw ſerrated; with the former it keeps firm hold of the ſtalks of ſubmarine plants, and with the other it cuts and minces its food very dexterouſly. The knobbed or numb-claw, as the fiſhermen call it, is ſometimes on the right, and ſometimes on the left indifferently. It is more dangerous to be ſeized by them with the cutting claw than the other, but in either caſe the quickeſt way to get diſengaged from the creature is to pluck off its claw: a new one will be produced in its place, though it will never attain the ſize of the former. The female, or hen lobſter, does not caſt her ſhell the ſame year that ſhe depoſits her ova, or in the common phraſe, the berry. When the ova firſt appear under her tail, they are very ſmall and extremely black, but they become in ſucceſſion almoſt as large as ripe elder berries before they are depoſited, and turn of a dark brown colour, eſpecially towards the end of the time of her depoſiting them. They continue full, and depoſiting the ova in conſtant ſucceſſion as long as the black ſubſtance can be found in their body, which, when boiled, turns of a beautiful red colour and is called the coral. Hen lobſters are found in berry at all times of the year. It is a common miſtake that a berried hen is always in perfection for the table. When her berries appear large and browniſh, ſhe will always be found exhauſted, watery, and poor. Though the ova be caſt at all times of the year, they ſeem only to come to life during the warm ſummer months of July and Auguſt. Great numbers of them may then be found under the appearance of *tadpoles* ſwimming about the little pools left by the tides among the rocks, and many alſo under their proper form from half an inch to four inches in length.

In caſting their ſhells, it is hard to conceive how the lobſters are able to draw the fleſh of their large claws out, leaving the ſhell entire, and attached to their body; in which ſtate they are conſtantly found. The fiſhermen ſay the lobſters pine before caſting, till the fleſh of its large claw is no thicker than the quill of a gooſe, which enables it to draw its parts through the joints and narrow paſſage near the trunk. The new ſhell is quite membranous at firſt, but hardens by degrees. Lobſters only grow in ſize while their ſhells are in their ſoft ſtate. They are choſen for the table by their being heavy, in proportion to their ſize; and by the hardneſs of their ſhells on the ſides, which when in perfection will not yield to moderate preſſure. Barnacles and other ſmall ſhell-fiſh adhering to them are eſteemed certain indications of ſuperior goodneſs. Cock lobſters are in general better than the hens in winter: they are diſtinguiſhed by the narrowneſs of their tail, and by their having a ſtrong ſpine upon the centre of each of the tranſverſe proceſſes beneath the tail, which ſupport the four middle plates of the tails. The fiſh of the lobſter's claw is more tender, delicate, and eaſy of digeſtion than that of the tail. The Scarborough fiſhermen do not take lobſters in pots as is uſual in ſtill and deep waters; they uſe a bag-net fixed to an iron hoop, about two feet in diameter, and ſuſpended by three lines like a ſcale. The bait is commonly fiſh-guts tied to the bottom and middle of the net. They can take none in the day-time, except when the water is thick: they are commonly caught in the night, but even then it is not poſſible to take any when the ſea has that luminous appearance which is ſuppoſed to proceed from the nereis noctiluca. In ſummer the lobſters are found near the ſhore, and thence to about ſix fathoms depth of water; and in winter they are ſeldom taken in leſs than twelve or fifteen fathoms. Like inſects, they are much more active and alert in warm weather than in cold. In the water they can run nimbly upon their legs, or ſmall claws, and if alarmed, can ſpring, tail foremoſt, to a ſurpriſing diſtance as ſwift as a bird can fly. The fiſhermen can ſee them paſs about thirty feet, and by the ſwiftneſs of their motions, ſuppoſe they may go much further. Athenæus remarks this circumſtance, and ſays the *incurvated* lobſters *will ſpring with the activity of dolphins*. Their eyes are raiſed upon moveable baſes, which enables them to ſee readily every way. When frightened, they will ſpring from a conſiderable diſtance to their hold in the rock; and, what is not leſs ſurpriſing than true, will throw themſelves into their hold in that manner, through an entrance barely ſufficient for their bodies to paſs; as is frequently ſeen by the people who endeavour to take them at Filey bridge. In froſty weather, if any happen to be found near the ſhore, they are quite torpid and benumbed.

FLUVIATILIS. Thorax ſmooth; ſnout dentated and armed at the baſe with a ſingle tooth on each ſide; hands ſcabrous.

Cancer aſtacus, Linn. The common craw-fiſh of Engliſh writers. This kind ſometimes, though very rarely, attains the ſize of a moderately ſmall lobſter; more commonly they ſcarcely exceed a finger's length. They inhabit rivers, lodging themſelves in holes, which they perforate in clayey banks. Colour olivaceous, or dark brown. Fleſh good. Found in various parts of Europe.

SERRATUS. Hands ſerrated; tail muricated on each ſide by a triple row of ſpinous protuberances. Zool. N. Holl. Inhabits New Holland.

NARVAL. Snout very long, aſcending, compreſſed, and ſerrated on each ſide. Fabr.

A native of the Mediterranean. The tail conſiſts of five leaves, the middle one of which is ſubulate.

CÆMENTARIUS. Thorax ſmooth, cylindrical; ſnout obtuſe; hands aculeated. Molin. Chili.

Very common in the rivers of Chili. Length eight inches; colour fuſcous, veined with red; fleſh white and very good.

CÆRULESCENS. Bluiſh; thorax ſmooth; ſnout advanced, ſubulate, and bidentated. Fabr. Inhabits deep waters. Thorax with two ſmall teeth at the baſe of the proboſcis; firſt ſegment of the abdomen very large; middle leaf of the tail emarginate; legs filiform. Very frequent between the tropics.

FULGENS. Proboſcis very ſhort and ſubulate; legs ſimple. Fabr.

Body ſmall, whitiſh, ſubdiaphanous; ſhines by night. Inhabits the ſea round Braſil.

HOMARI. Segments of the body ſlightly ſpinous on the back; tail faſciculated, and armed with ſerrated ſtyles. Fabr. Found on the coaſt of Norway.

FULVUS. Thorax ſmooth; proboſcis ſhort, ſerrated on both ſides; hands compreſſed, and crenated on each ſide. Fabr.

HARENGUM. Snout ſubulate; eyes globoſe and prominent. Fabr.

This is the principal food of herrings and cod-fiſh, inhabiting the ſeas in prodigious numbers. The body is minute, white, and filiform. Aſtacus halecum of Gmelin.

CRASSICORNIS. Thorax articulated, the ſixth pair of legs very long. Fabr. Inhabits the American ſeas. Thorax carinated on the back, and conſiſting of eight joints; the anterior part retuſe and without proboſcis; tail with ſix filiform ſtyles. Colour reddiſh. Size of the common ſhrimp.

HISTRIO. Thorax armed at the margin with two teeth; ſnout lanceolate, and ſerrated; body variegated. Fabr. Inhabits Greenland. Size ſmall.

PLANATUS. Proboſcis very ſhort and ſubulate; hands very long, with a compreſſed carinated finger. Fabr. Brit. Muſ.

Body ſmooth, pale, and without ſpots; hands flat, above reddiſh, beneath yellowiſh, with a ſingle raiſed line; legs yellowiſh. Size of the common ſhrimp.

BOREAS. Thorax prickly, ſecond and third pair of legs filiform. Fabr. Deſcribed in Phipps's voyage as an inhabitant of the North Sea. The proboſcis is ſhort, depreſſed, acute, grooved on both ſides, with a ſtrong tooth beneath.

CARINATUS. Thorax with a dentated keel; proboſcis ſhort, recurved, and furniſhed with three teeth at the tip. The native place of this ſpecies is unknown.

GROENLANDICUS. Anterior margin of the thorax and proboſcis toothed; feelers ſpinous at the tip; body fuſcous. Inhabits the Greenland ſeas. Snout advanced, with three teeth above and two beneath; exterior pair of antennæ very long, and variegated with red and white; anterior part of the margin of the thorax with three teeth, and back carinated with four; ſegments of the abdomen ending in a ſpine each ſide; middle leaf of the tail with two toothed lines.

VARIUS. Margin of the thorax with a ſingle tooth; proboſcis ſerrated on both ſides; body variegated.

Deſcribed by Fabricius from a ſpecimen taken in the Norway Ocean in the month of Auguſt. The exterior antennæ are longer than the body, rufous with four white ſpots. Thorax cylindrical, ſmooth, with a ſtrong tooth above the eyes. Proboſcis projecting, aſcending, and ſerrated both above and beneath. Abdomen cinereous, with many oblique rufous bands; middle leaf of the tail ſubulate; ſecond pair of legs filiform, and longer than the reſt.

SCABER. Anterior part of the thorax ſcabrous; ſnout ſhort, ſubulate; hands oblong and hairy. Fabr. Inhabits the Indian Ocean. Muſ. Daldorff. Smaller than aſtacus norwegicus.

### Section. ** *Inner pair of antennæ three-cleft.*

JAMAICENSIS. Proboſcis ſerrated above, beneath tridentated; arms and hands muricated, pincers with a ſtrong ſpine on the inner edge. Sloane, &c. Inhabits Jamaica.

NORWEGICUS. Thorax ſpinous on the anterior part; hands priſm-ſhaped, with ſpinous angles. Fabr. Cancer norwegicus. Linn. Found chiefly in the Norway ſea, from whence its name.

PENNACEUS. Thorax ſmooth; proboſcis projecting and ſerrated above, beneath ſmooth; fingers filiform.

This is ſmaller than the laſt. Margin of the thorax with a ſingle tooth each ſide; hands ſhort, ovate with linear acute fingers.

CRANGON. Thorax ſmooth; proboſcis ſhort, and very entire; hands with a ſingle moveable fang. Inhabits moſt ſandy ſhores of Europe. With us is known by the name of ſhrimp. Fleſh delicate. This has only ſix legs; middle leaf of the tail ſubulate; colour pale-yellowiſh, ſemi-tranſparent and dotted.

TETTIGONUS. Thorax ſpinous; four anterior legs filiform. Fabr. Inhabits Iceland.

### *** Family PALÆMON.

Antennæ four; the interior ſhort, trifid, with a ſcale, or plate at the baſe; the exterior very long and ſetaceous; body ſubcylindric; anterior feet terminating commonly in pincers.

CARCINUS. Hand-claws equal, projecting and muricated; proboſcis aſcending, and longer than the antennæ plates. Fabr.—Locuſta marina. Rumpf. Aſtacus fluviatilis major, Sloane. Inhabits rivers of America.

LONGIMANUS. Hand-claws advanced, unequal, ſmooth; ſnout ſtraight, and of the ſame length as the antennæ plates.

Inhabits the Eaſt Indies. The thorax is ſmooth, with two teeth on each ſide at the anterior part; hands filiform, projecting, ſmooth, the left one much longeſt; legs ſmooth.

BREVIMANUS. Hand claws of moderate length; fingers or pincers rather ſhort; proboſcis aſcending, and longer than the antennæ plates.

A native of the Eaſt Indies. *Muſ.* Daldorff.

Smaller than *longimanus*; ſnout compreſſed, and ſerrated on both ſides; thorax ſmooth, glabrous, with two teeth on each ſide of the anterior part; hand-claws filiform, and rather longer than the legs, and ſmooth.

COROMANDELIANUS. Hand-claws of moderate length; pincers rather ſhort; ſnout ſame length as the antennæ plates. From the coaſt of Coromandel. Very ſimilar to the preceding, of which it may be only a variety; it differs principally in the proboſcis, being ſhorter as well as the pincers.

TRANQUEBARICUS. Hand-claws long and filiform; hands ovate. Inhabits Tranquebar. Daldorff.

Snout aſcending, rather longer than the antennæ plates, and ſerrated at the back; hand-claws as long as the body, filiform, very thin and ſmooth; hands thick; legs filiform and ſmooth.

LAR. Hand-claws projecting, equal, muricated; ſnout ſtraight, and length of the antennæ ſcales.

Inhabits India. Fabr. Thorax ſmooth, with two acute teeth on each ſide; ſnout compreſſed and ſerrated; legs muricated.

SERRATUS. Thorax ſmooth and ſubcarinated; ſnout ſerrated on each ſide. Inhabits the Norway Sea. Vahl.

FUCORUM. Thorax ſmooth; ſnout aſcending, with five teeth at the apex. Lives among fuci. Daldorff.

SQUILLA. Thorax ſmooth; proboſcis ſerrated above, and three-toothed beneath; margin of the thorax with five teeth. Fabr.

The prawn. Inhabits European ſeas.

LOCUSTA. Thorax ſmooth; proboſcis projecting, advanced, above ſerrated, beneath ſmooth; pincers elongated and filiform. Aſtacus locuſta. Fabr. Ent. Syſt. Cancer locuſta. Linn.

### **** Family. ALPHEUS.

Antennæ four; the interior ſhort and bifid; exterior long, ſimple, with a ſcale or plate at the firſt joint of the peduncle.

TAMULUS. Hand-claws unequal; the left hand ſmall and filiform. Inhabits the Indian Ocean. Daldorff.

AVARUS. Hand-claws unequal; ſnout ſhort and ſubulate. Inhabits India. Daldorff. The inner pair of antennæ blue; thorax ſmooth; ſnout ſharp-pointed; four hand-claws, the anterior ones largeſt; right hand large and compreſſed; poſterior pair very thin and filiform.

*Obſ.* Tamulus and avarus are perhaps only varieties of the ſame ſpecies.

RAPAX. Hand-claws unequal; anterior part of the thorax carinated; ſnout ſubulate. Daldorff.

A native of the Indian Sea. Thorax ſmooth and glabrous; four hand-claws, the anterior pair of which has ſometimes the right hand, ſometimes the left hand largeſt.

MALABARICUS. Hand-claws unequal; right hand largeſt; legs filiform.

Inhabits the Indian Sea. Left hand longer than the right, (which is largeſt), and filiform.

### Genus Scyllarus.

Antennæ four, unequal; inner pair rather long, filiform, with the laſt joint bifid; exterior ones depreſſed, flat, and dilated, and ciliated with ſpines; thorax large, and uſually aculeated or rough; body long; tail with ſwimming appendages; legs ten; no cheliform arms.

Species.

Arctus. Five ſpines on the anterior part of the thorax; plates of the antennæ ciliated and aculeated.

Cancer arctus. Linn. Potiquiquixe. Jonſt. Umiktak. Müller. Urſa caſtrata. Belon. and Der Bärenkrebs of Herbſt. This is an inhabitant of moſt ſeas. Its ſize is ſuperior to that of the common lobſter. The ſhells are tuberculated, of a brown colour, and ſpotted with yellow; legs ſpotted; thighs ſpinous. Muſ. Donov.

Æquinoctialis. Scabrous; thorax and plates of the antennæ crenated. Brow. Jam. Fabr. &c.

Antarctius. Rough and piloſe; thorax and plates of the antennæ ſerrated and ciliated. A native of India. Fabr. Muſ. Donov.

Orientalis. Scabrous; anterior part of the thorax at each ſide armed with three ſpines; eyes placed cloſe to the foremoſt one. Eaſt Indies. Fabr. Muſ. Donov.

The thorax of this ſpecies, which is of the middle ſize, is rough, with three diſtinct elevated ſpines down the back; colour pale brown.

Australis. Plates of the antennæ roundiſh and ſmooth. Fabr. Muſ. Bankſ.

Diſcovered in the South Seas. Its general figure ſomewhat reſembles arctus, but is narrower; the thorax unequal, with crenated margin; claws ſimple.

### Genus Palinurus.

Antennæ four, unequal, pedunculate; peduncle jointed; interior pair ſhort, ſetaceous, bifid, and unarmed; exterior very long, ſetaceous, and aculeated, or hiſpid; body elongated; legs ten, armed with claws deſtitute of pincers, and tufted with hair at their extremity.

Species.

Homarus. Thorax prickly on the anterior part with two horns in front; arms without hand-claws.—Cancer homarus. Linn. Aſtacus homarus. Fabr. Ent. Syſt. &c. Larger than the common lobſter.

Elephas. Thorax muricate, with four horns on the anterior part; the middle ones larger and toothed.—Palinurus quadricornis. Fabr. Suppl. Aſtacus elephas. Ent. Syſt.

Polyphagus. Thorax very ſlightly ſpinous; legs marbled with blue. Herbſt.

Ornatus. Green, ſides ſpotted with white, abdominal ſegments ſmoothiſh; nearly allied to homarus; ſhorter antennæ, and legs blue, banded with white.

Inhabits the Indian Sea. Fabr. &c. Probably a variety of polyphagus, and not ſufficiently diſtinct from the following ſpecies, which is alſo introduced from Fabricius.

Fasciatus. Greeniſh; abdominal ſegments with a white poſterior band. Muſ. Daldorff. Fabr. A native of the Indian Ocean.

### Genus Galathea.

Antennæ four, unequal and pedunculate; inner ones ſhort, filiform, of three joints, that at the extremity bifid: outer pair ſetaceous and long; body elongated; tail foliaceous; legs uſually ten; arms chelate.

Species.

Strigosa. Thorax plaited on the fore part with ciliated wrinkles; ſnout acute, with ſeven denticles. Fabr. Cancer ſtrigoſus. Linn.

Length from five to ſeven inches when full grown; colour brown; tips of the pincers of the fore-claws red. Inhabits Europe. Muſ. Donov.

Rugosa. Thorax with ciliated wrinkles on the anterior part, and ſpinous; ſnout with three denticles; arms long and ſlender. Galathea rugoſa. Fabr. Cancer rugoſus. Gmel. Cancer bamffius. Penn.

Diſcovered by Mr. Cordiner on the coaſt of Bamff, Scotland. Muſ. Donov.

Gregaria. Thorax with ciliated plates; ſnout with three denticles; anterior feelers very long. Fabr.

Much ſmaller than the two preceding. It is found in the ſea round the coaſt of Patagonia, where it occurs ſometimes in ſuch vaſt ſhoals that the ſea appears perfectly red, that being the prevailing colour of them when alive; it has a brown ſpot on the back; and the hand-claws are rough, Muſ. Bankſ.

Amplectens. Thorax ſmooth; ſnout very ſhort and emarginate; middle pair of legs very long.

The body of this kind is ſmall, whitiſh, ſubdiaphanous, and dotted with red; thorax unarmed, roundiſh behind, and broad, and narrowing towards the front; four antennæ ſetaceous, and very long; abdomen of five ſegments; tail of five leaves, the middle one tongue-ſhaped.

This kind is highly luminous by night; it inhabits the Atlantic, near the coaſt of Braſil. Fabr. Muſ. Bankſ.

### Genus Hippa.

Antennæ ſometimes two, and pedunculate; commonly four, unequal, and fringed with thick hairs; inner pair very ſhort, and bifid; body oblong; tail with ſmall lateral appendages at the joints next the baſe; legs uſually ten, and deſtitute of pincers.

Species.

Adactyla. Thorax ſmooth, with very entire margin; tail inflected, the laſt joint long, ſubulate, and ciliated at each ſide; hand-claw without fangs. Inhabits the South ſeas. Bankſian Cab. Cancer Adactylus, Gmel.

Testudinaria. Thorax ſomewhat ovate, ſmooth, four-toothed in front, ſecond pair of legs longeſt. Herbſt. Muſ.

Eremitus. Tail inflected, laſt joint ovate. Fabr. Inhabits the Indian ſeas. Manibus nullis, pedibus utrinque quinque natatoriis, Linn.

Dorsipes. Thorax glabrous, truncated in front, and armed with ſeven teeth; hand-claws compreſſed, and furniſhed with a falcated thumb. Fabr. Cancer dorſipes, Linn.

This kind inhabits the Indian and Southern Oceans. Length of the body and tail about three inches. Thorax ſmooth, and of a whitiſh colour, the margins hairy and crenated; a ſmall plait ciliated with denticles projects before the front. The outer feelers contain four joints, the firſt and ſecond of which are long, cruſtaceous, compreſſed, and ciliated; tail thin; hand-claws rough above, beneath ſmooth, pincers very ſhort.

Symnista. Thorax truncated and ciliated in front; hand-claws heart-ſhaped. Inhabits India. Cancer ſymniſta of Linnæus.

Scabra. Thorax ovate, truncated before, and armed with many teeth; hand-claws compreſſed, and toothed at each ſide. A native of the South Seas. Muſ. Bankſ.

The thorax of this ſpecies is large, ovate, and rough, with elevated oblong dots, ſides crenated; tail very ſhort, inflected and ciliated; hand-claws incurvated, hands large and rough, with two teeth on the ſuperior margin, and five on the lower one: legs eight, compreſſed, and ciliated, the extreme joint ovate-lanceolate. Fabr. &c.

Dentata. Thorax ſmooth, with five teeth on each ſide; tarſi ſpinous. Fabr. Inhabits European ſeas.

Moderate ſize, gloſſy, pale colour, with a tooth on each ſide, behind the eye, three in the middle, and one behind; arms twice the length of the body, and ſomewhat ſpinous.

Scutellata. Thorax nearly entire and ciliated; hands chelate. Fabr.

Deſcribed by Fabricius, from a ſpecimen in the Britiſh muſeum. Native place unknown. It is ſmall, with ovate thorax, rounded in front, and becoming narrower behind; hands ſmooth.

Gmelin adds to the above ſpecies, Cancharus of Linn. and Sinicus of Herbſt, but expreſſes doubt whether they are of this family or genus.

Cancharus has the thorax rugoſe, oval, hands compreſſed, and ſpinous at the margin. Linn. Inhabits South America and India.

Sinicus. Thorax ſomewhat compreſſed, oval, and ſpinous; arms and legs ſpinous. Herbſt. A native of China.

### * Section Symethis.

Antennæ two, very ſhort, and containing four joints each.

Variolosa. Thorax variolous, and toothed in front; legs furrowed at the tip. Fabr. Ent. Syſt. Inhabits the Indian Ocean.

This ſpecies, arranged in the former works of Fabricius in the genus Hippa, forms a new genus, of which it is the only ſpecies in Supplementum Ent. Syſt. under the name of Symethis, Fabricius having found that inſtead of four antennæ it poſſeſſes only two, and thoſe different in ſtructure from Hippa. His genus Symethis is thus deſcribed: antennæ duæ breviſſimæ, quadriarticiolatæ, intra roſtrum binulæ reconditæ. Perhaps it ought rather to form a new genus than ſection of Hippa, in the preſent arrangement. It is of the middle ſize; ſnout ſhort and ſeven-toothed; anterior part of the thorax with unequal impreſſed dots and obtuſe teeth, ſmooth behind, with lateral rugoſities; hands ſmooth; legs elongated, ciliated, and hooked at the tip. Muſ. Spengler.

Obſ. Fabricius in Supplementum Ent. refers five of the above deſcribed ſpecies to his new genus albunea; ſymniſta, ſcutellata, dorſipes, ſcabra, and dentata.

### Genus Ranina.

Antennæ four, ſhort; the two inner ones bifid at the extreme joint; body oblong, wedge-ſhaped, truncated in front; tail ſmall, and ciliated at the edges; legs eight, the four poſterior ones terminating in ſwimmers; hand-claws two, armed with pincers.

### Species.

Serrata. Cancer raninus, Linn.? Ranina ſerrata, La Marck.

The thorax of this crab is aculeated, or covered with prickles; colour fuſcous; hairs that fringe the legs and tail yellowiſh brown. Inhabits the Indian ſeas. Rumpf. and Herbſt.

### Genus Squilla.

Antennæ four, nearly equal, and pedunculate; interior pair rather long and trifid, the exterior ones with an oblong plate; thorax ſhort; tail very long, and enlarging towards the poſterior extremity; legs fourteen.

### Species.

Maculata. Hands with a ſingle ten-dentated fang; body very ſmooth; tail five-toothed on each ſide. Fabr. Suppl.

Mantis. Hands with a ſingle ſix-dentated fang, ſubangulated; tail ſerrated and ſpinous. Fabr. Suppl. Cancer mantis, Linn.

Inhabits chiefly the Mediterranean and Aſiatic ſeas. I eaten by the Italians and the Chineſe. Length about five or ſix inches.

Raphidea. Hands with a ſingle eight-dentated fang; body with two elevated lines on each ſide.

Very ſimilar to Squilla mantis. Found in the Indian Ocean. Muſ. Daldorff.

Phalangium. Hands with a ſingle five-dentated fang, the firſt and third tooth of which are longeſt; body ſmooth. Inhabits the Eaſt Indian ſeas. Body ſmaller than S. mantis, ſmooth, glabrous; laſt ſegment ſerrated with ſpines. Muſ. Daldorff.

Ichneumon. Hands with a ſingle four-dentated fang; margin of the tail ciliated, with thick ſpinous protuberances. From the Eaſt Indies. Muſ. Daldorff. Smaller than S. phalangium; body with three elevated lines on both ſides.

Scyllarus. Hands with a ſingle ſtraight, ventricoſe, angular, three-toothed fang. Inhabits Aſia. Fabr. Cancer ſcyllarus, Linn.

Ciliata. Hands with a ſingle three-toothed fang; two extreme joints of the abdomen ciliated with ſpines. Inhabits the Indian ſeas. Spengler.

Chiagra. Hands with a ſingle fang, ſubulate, with a rufous protuberance at the baſe. Fabr. Squilla arenaria of Rumphius. This is a native of the South Sea. Muſ. Banks.

Vitrea. Thorax ſmooth, carinated with ſubulate angles; hands with a ſingle ſubulate unarmed fang. Found in the Atlantic Ocean. Muſ. Banks.

### Genus Pagurus.

Antennæ four, unequal, the inner ones ſhort and bifid at the ſummit, the exterior ſetaceous, and uſually longeſt; body oblong, thorax cruſtaceous; abdomen veſicular, naked, ſoft, and furniſhed at the tip with hooks or claws.

The ſpecies of this genus are moſtly paraſitical, and inhabit the empty cavities of turbinated ſhells, the animals of which they attack and devour to gain poſſeſſion of their ſhell, and it is chiefly on the teſtaceous molluſca, or *ſhell fiſh*, that they ſubſiſt. They change their habitation as they increaſe in growth, firſt occupying the ſhells of the common periwinkle, or trochus, then perhaps a nerit as large as a walnut, and after that a whelk. But the paguri of climates warmer than thoſe of Europe are often larger than with us, and require ſhells of conſiderable ſize for their habitation. The tail is naked and tender, being covered only with a ſkin of very delicate texture, but it is furniſhed at the extremity with one or more hooks, by means of which it ſecures itſelf to the ſhell which it makes choice of. It is aſtoniſhing with what facility thoſe animals crawl both in the water and on the ſtrand, bearing at the ſame time the ſhell that ſerves them as a covering on their back. They are indiſcriminately called ſoldier-crabs and hermit-crabs, from the idea of their living in a tent, or retiring into a cell.

### Species.

Latro. Thorax at the ſuture four-cleft; tail ſimple and ventricoſe beneath. Linn. Bouverſires, Rochef. &c. A native of the Eaſt Indies. Inhabits the holes and cavities of rocks, from whence it wanders abroad in the night-time in ſearch of cocoa nuts, which it procures by climbing up the trees, and throwing them down, then deſcending after them, and tearing them open with the two fore-claws.

The Indians eat the fleſh of this kind of hermit-crab after taking out the entrails, which they think poiſonous.

Miles. *Paraſitic.* Left hand largeſt, and muricated on each ſide; legs with very long ſerrated claws. Herbſt. Fabr.

A ſpecies of large ſize. Inhabits the Eaſt Indies.

Custos. *Paraſitic.* Left hand-claw largeſt; hand ſmooth; legs with very long ſmooth claws. Fabr.

A native of the Eaſt Indies, deſcribed in Suppl. Fabr. from the Muſeum of Daldorff; much reſembles *Miles*, but is diſtinct.

Diaphanus. *Paraſitic.* Depreſſed; left hand largeſt and ſmoothiſh; joint below dilated on the back. Inhabits the Indian ſea.

Aniculus. *Paraſitic.* Thorax ovate, ciliated at the ſides; legs rugged, and hairy. Fabr. Deſcribed from the Bankſian cabinet. Inhabits the South Seas.

Bernhardus. *Paraſitic.* Hand-claws muricated, the right one largeſt. Linn. An European kind.

Hungarus. *Paraſitic.* Hands hairy and tipped with black, the right one largeſt, body banded with red. Herbſt.

A native of India. Smaller than Pagurus Diogenes. Peduncle of the eyes pale with red bands; body ſmooth; legs and hands hirſute.

Clypeatus. *Paraſitic.* Thorax ſmooth, very entire and compreſſed; left hand largeſt, and with the legs dotted. Fabr.

Body ſmall, compreſſed, whitiſh. Antennæ fuſcous; hands white, with purple dots, and a marginal blue ſpot. Legs white with innumerable dots and ſpecklings of purple.

Diogenes. *Paraſitic.* Hands muricated, pubeſcent; left hand largeſt. Fabr. Suppl. &c.

Called by Kaempfer, Gami na al Koona, and Modderman of Rumphius. Inhabits American and Indian ſeas. This, like moſt of its genus, inhabits empty ſhells; the general colour is pale teſtaceous or yellowiſh brown.

Tubularis. *Paraſitic.* Subcylindrical: ſhell with excavated dots. Fabr.

Cancer tubularis, Linn. Inhabits the ſhells of Serpula glomerata in the Mediterranean.

Oculatus. *Paraſitic.* Hand-claws muricated, equal; peduncles of the eyes as long as the thorax. Fabr.

Found chiefly in the ſhells of Murex Brandaris. Size of Bernhardus, our common hermit crab. Body entirely ferruginous; peduncles of the eyes advanced or projecting, cylindrical, with a tooth at the baſe. Arms with a ſanguineous ſpot on each ſide; hand-claws rough.

Alatus. *Paraſitic.* Hands ſmooth, with three wing-like projections; right hand largeſt. Fabr. Inhabits Iceland. Dr. Koenig. Rather ſmaller than Bernhardus; joint below the hands rough; wing-like projections acute.

Ophthalmicus. *Paraſitic.* Hands equal, muricated; legs faſciculated with hairs; eyes clavate. Inhabits the Indian Ocean. Daldorff. Eyes large, and placed on ſhort peduncles, at the baſe a ſmall acute ſcale; hands ſhort, equal, muricated, with hairs, rufous. Perhaps Cancer Clibanarius of Herbſt.

Araneiformis. *Paraſitic.* Hands rough; tail callous at the tip, and furniſhed with a hooked tip. Fabr.

Sclopetarius. *Paraſitic.* Thorax ſmooth, entire; hands equal, granulated, thighs of the ſecond pair of legs compreſſed. Herbſt. Der Muſketier.

This is about half the ſize of Pagurus Bernhardus; colour pale brown, with a blue ſtreak down the middle of the two anterior pair of legs, and peduncles of the eyes of the ſame colour.

Tympanista. *Paraſitic.* Thorax ſmooth, very entire; legs ſtriated; claws marbled. Der Trommelſchläger. Herbſt. Smaller than the foregoing; hands linear.

Tibicen. *Paraſitic.* Thorax ſmooth, and very entire; left hand-claw largeſt; hands and legs cheſnut, whitiſh at the tip.

Excavatus. *Paraſitic.* Right hand largeſt, with two excavations, and another ſimilar on the moveable pincer. Der Auſgehöhlte. Herbſt.

Scævola. *Paraſitic.* Hands muricated, left one largeſt, whitiſh; inner ſides bearded; eyes obliquely wedged, pedicle compreſſed. Forſkäl, &c.

Lagopodes. *Paraſitic.* Cinereous brown; legs rough with hirſuties; left hand largeſt. Forſkäl.

Dubius. *Paraſitic.* Hands ſomewhat glabrous; that on the left ſide ſmalleſt. Herbſt. Muſ. Donov.

Canaliculatus. *Paraſitic.* Hands and joint below grooved, with elevated denticulate margin; legs with hairy tufts. Cancer canaliculatus. Herbſt.

Megistos. Rufous with roundiſh white ſpots; hands and legs ſpinous, and hirſute. Herbſt.

A beautiful ſpecies, legs and claws vermilion; thorax paler and body inclining to purple, and ſprinkled all over with diſtinct roundiſh white ſpots; laſt ſegment of the abdomen and baſe of the tail red, but the tail itſelf brown and immaculate. Size of a moderately ſmall lobſter, or rather leſs.

Strigatus. *Paraſitic.* Thorax rather flat, and whitiſh; hands and legs rufous, with tranſverſe ſtreaks. Herbſt. Muſ. Found in a volute. Smaller than Pagurus Bernhardus.

Pedunculatus. *Paraſitic.* Thorax flat, depreſſed; peduncles of the eyes thick; left hand largeſt, inflated, and muricated. Herbſt. Muſ. Donov.

General colour pale ferruginous; abdomen cinereous, marked with pale, yellowiſh at the tip; two poſterior pair of legs pale.

Arrosor. *Paraſitic.* Thorax flat; hands and legs with numerous tranſverſe, irregular furrows. Cancer Arroſor, Herbſt.

### Crustaceous Animals.

Third order, *Cruſtacées ſeſſiliocles, La Marck.*

Heads generally diſtinct from the thorax; eyes fixed and ſeſſile; body long, and covered with many plates.

### Genus Gammarus.

Antennæ four, very ſimple and pedunculate; anterior ones ſhort and ſubulate; poſterior ſetaceous. Head diſtinct, body ſmall, oblong, compreſſed, linear, of many joints. Tail with many ſtyles; legs numerous.

### Species.

Ampulla. Hands without fangs; legs fourteen; poſterior thighs compreſſed and dilated. Inhabits the North Seas. Phipps.

Carinatus. Hands without fangs; legs fourteen; back carinated, and ſpinous. Fabr.

Larger than Gammarus Locuſta; body whitiſh, ſomewhat compreſſed, back carinated; ſegments ſomewhat ſpinous behind. Muſ. Brit.

Nugax. Hands without fangs; legs fourteen; ſix poſterior thighs compreſſed and dilated. Inhabits the North Seas. Phipps Voy.

Cancellus. Hands without fangs; legs ſixteen. Inhabits rivers of Siberia. Oniſcus cancellus of Pallas.

Longicornis. Hands without fangs; antennæ longer than the body; tail obtuſe. Fabr. Cancer groſſipes, Linn. Oniſcus volutator, Pallas. Cancer linearis. Penn.

Locusta. Hands four, without fangs; legs fourteen, thighs ſimple; tail with bifid ſpines. Inhabits ſandy ſhores of Europe.

Pulex. Hands four, without fangs; legs ten. Fabr. Cancer pulex, Linn. Pulex fluviatilis, Ray. Very common in rivers, rivulets, and fountains. Suppoſed to be luminous at times by night. Swims in an incurvated poſture.

Corniger. Hands without fangs; proboſcis incurvated and ſubulate; ſides of the thorax with a double horn. Inhabits the Norway ſeas. The body conſiſts of eleven ſhort ſegments, whitiſh, edged with red.

Linearis. Hands four with a ſingle fang; legs ten. Cancer linearis, Linn. Oniſcus ſcolopendroides, Pallas.

Salinus. Legs twenty, ſpreading; tail ſubulate. Matty.

Stagnalis. Hands without fangs; legs twenty-two; tail cylindrical and bifid. Linn. Tranſ.

Gibbosus. Oblong, gibbous; antennæ folded, and very long. Inhabits Portugal.

Body ſmall, ſmooth, glabrous, yellowiſh ſprinkled with dots of fuſcous. Head thick, obtuſe, with a large green ſpot; eyes large. Antennæ ſetaceous, and bent under the body, folded, and three times the length of the body; tail conſiſting of three acuminated leaves.

Esca. Hands without fangs; tail jointed, ſubulate, and cleft at the tip. Size of Gammarus pulex. Inhabits the Norway Sea, and is the principal food of herrings. Body blackiſh; head ſomewhat hyaline; tail nearly as long as the body.

Medusarum. Hands four with a ſingle fang; head very obtuſe. Inhabits Northern ſeas, and often found adhering to Meduſæ. Ström.

Podurus. Body containing twelve joints; hands four without fangs; legs eight; two laſt joints of the body and the tail ſpinous. Müller.

Mutilus. Arms four, ſecond pair chelate; legs eight; body of ten joints. Müller.

Arenarius. Anterior part flattiſh; poſterior carinated, and ſomewhat ſerrated; four anterior legs cheliform and ſmooth; antennæ nearly equal. Acta Halfn.

Spinicarpus. Four anterior legs cheliform, the joint below the hand produced into an incurvated acute ſpine. Zool. Dan.

Ventricosus. Inflated in the middle, flattiſh, and red; legs fourteen; ſetaceous, the ſecond pair clavate, Müller. Much reſembling the larva of a mantis. Length half an inch.

CANCHARUS, in *Entomology*, a ſpecies of Cancer, (Hippa Fabr.) deſcribed by Linnæus as a native of South America and India, the thorax of which is oval and rugged, with the hand-claws compreſſed, and ſpinous at the margin.

CANCHE, in *Geography*, a river of France, which runs into the ſea, near Etaples, in the department of the Straits of Calais.

CANCHY, a town of France, in the department of the Somme; 5 miles N. of Abbeville.—Alſo, a town in the department of the Calvados; 10 miles W. of Bayeux.

CANCON, a town of France, in the department of the Lot and Garonne, and chief place of a canton, in the diſtrict of Villeneuve-d'Agen, 2 leagues W. of Montflanquin. The place contains 1425, and the canton 8506 inhabitants; the territory includes 162½ kiliometres, and 11 communes.

CANCRIFORMIS, in *Entomology*, a ſpecies of Cerambyx, found in South America. The thorax is armed with many teeth; back flat; wing-caſes and anterior ſhanks with a ſingle tooth. Fabricius. Obſ. This is cerambyx puſtulatus of Drury's illuſtrations.

CANCRINE verſes, in *Poetry*, denote the ſame with *retrograde*; which ſee.

CANCRINUS of Rumphius, in *Entomology*, ſynonymous with Cancer cursor. See Cursor.

CANCRIZANS, Lat. Cancrizante, Ital. terms in *Muſic* for a canon, in which one of the parts moves like a crab-fiſh, backwards: as when two parts begin together at different ends of the movement in the ſame melody, paſſing each other till they arrive at the ſeveral ends; then turning back and ending where they began.

CANCROMA, in *Ornithology*, a curious genus of birds, called in England the boat-bill. The ſtructure of its bill is very extraordinary, and has been not inaptly compared to an inverted boat, whence its name; it is alſo gibbous, or ſwollen; noſtrils ſmall, placed in a furrow; tongue ſmall; toes divided.

Two ſpecies only of this genus have been hitherto diſcovered, namely, cochlearia and cancrophaga, which ſee.

CANCROPHAGA, a ſpecies of Cancroma, with a whitiſh belly. This is the cochlearius fuſcus of Briſſ. the tamatia of Maregrave, Ray, &c. and cuillier brune of Buffon.

CANCZUCA, in *Geography*, a town of Poland, in the palatinate of Lemberg; 36 miles W. of Lemberg.

CANDA, a town of Italy, belonging to the ſtate of Venice, in the Poleſin de Rovigno; 14 miles W.S.W. of Rovigno.—Alſo, a river of England, which runs into the Eden at Carliſle.

CANDABORA, in *Ancient Geography*, a town of Spain belonging to the Celtiberians. Ptolemy.

CANDAHAR, or Kandákar, in *Geography*, a country of Aſia, being part of the ancient *Paropamiſus*, and ſituate between the two powerful kingdoms of Hindooſtan and Perſia, became alternately a province of the Mogul empire and of Perſia, till it was again formed into an independent kingdom, as it had formerly been, by Ahmed Shah, one of the Afghan tribe of Abdalli, who, from an obſcure origin, roſe progreſſively in the ſervice of Nadir Shah, or Kuli Khan, to the rank of an Afghan prince. Nadir ſtripped him of his country, and compelled him to join his army in 1739. On the death of Nadir he ſuddenly appeared among his former ſubjects, and in a ſhort time erected for himſelf a conſiderable kingdom in the eaſtern part of Perſia; adding to it moſt of the Indian provinces ceded by the mogul to Nadir Shah. He died about the year 1773, and was ſucceeded by Timur Shah, uſually ſtyled king of Candahar, whoſe ſubjects, in 1783, are ſaid to have lived under an eaſy government, conſidered as an Aſiatic one. At this time the military force of Candahar was eſtimated at 200,000 men. His predeceſſor Ahmed Abdalla had regular infantry, cloathed like the Britiſh ſepoys, and, at one time, made uſe of the Britiſh manufactures for this purpoſe. The trade went by Sindy, and up the Indus and its branches, to Cabul; but it has been long at an end. The ſucceſſor of Timur was Zemaun, whoſe chief ſubjects are Afghans, or the people of the mountains between Perſia and Hindooſtan, who may be conſidered as the founders of the empire; the others are Hindoos, Perſians, and a few Tartars. Candahar is bounded on the north by the Gaur and the province of Balk; on the eaſt by Cabul and the river Indus; on the weſt by Segeſtan, and on the ſouth by Arrhokage, Mekran, Sewee, and Moultan. Beſides Candahar Proper, this empire in its greater extent includes Cabuliſtan, Ghizni, Caſhmire, part of Segeſtan and part of Chioraſan. See Cabul. Every part of it is mountainous except that which lies towards Perſia. The chief city is Candahar.

Candahar, a city of Candahar, the kingdom abovementioned, is aſcribed by M. d'Anville and others to Perſia. While the Perſian and Mogul empires were ſeverally undivided, this was the frontier city and fortreſs of Hindooſtan towards Perſia, and was eſteemed the key of the weſtern provinces of the latter, and not unfrequently changed maſters. As Cabul was conſidered in a political light as the gate of India towards Tartary, Candahar held the ſame rank with regard to Perſia; and hence it has derived its chief importance. Major Rennell has ſhewn that Candahar cannot be the ſame place, as ſome have ſuppoſed, with the Paromiſan Alexandria of Alexander. This city, ſays Forſter, in his "Journey from Bengal to England," compriſed within an ordinary fortification of about three miles in circumference, and of a ſquare form, is populous and flouriſhing; and lying in the great road which connects India with Perſia and Tartary, it has been long a diſtinguiſhed mart. It is abundantly ſupplied with proviſions; the fruits are of an excellent quality; and the extenſive range of ſhops occupied by Hindoo traders atteſts the liberty and protection which they enjoy at Candahar. The tract of territory dependent upon it is ſaid to produce a revenue of 18 lacs of rupees; and from the appearance of all claſſes of people, the collection ſeems to be made without any extraordinary rigour. The environs of Candahar occupy an extenſive plain, covered with fruit gardens and cultivation, and interſperſed with numerous ſtreams of ſo excellent a quality as to become proverbial; and the climate is happily tempered between the heat of India and the cold of Ghizni. To the weſt there is a conſiderable deſert, extending nearly to Herat, which renders the paſſage from Perſia to Hindooſtan difficult. Between the mountains of Hindoo-Kho, and thoſe of Candahar, the country aſſumes the form of an extenſive valley, from Cabul to the borders of Choraſan; and in the tract between Cabul and Candahar, the higheſt point of elevation of the country is marked by the deſcent of the waters from it in almoſt every direction. The diſtance from Candahar by Cabul to Agra is 1208 miles; to Benares, 1588; to Calcutta by Moorſhedabad, 2152; by Birboom, 2047; and to Delhi by Cabul, 1071. N. lat. 33°. E. long. 65° 33′.

CANDAIL, a town of Perſia, in the province of Mekran; 148 miles E. of Kidge.

CANDANA, in *Ancient Geography*, a town of Aſia, in Paphlagonia.

CANDASA, a town of Aſia Minor, in Caria. Polybius.

CANDAU, in *Geography*, a town of the duchy of Courland; 24 miles E. of Goldingen.

CANDAVIA, in *Ancient Geography*, a county of Macedonia, mentioned by Cæſar and alſo by Seneca, which lay at ſome diſtance E. of Dyrrachium. It was bounded towards the eaſt by the Candavian mountains, from which flowed the river Panyaſus. Theſe are ſuppoſed to be the "Cambavii montes" of Livy, and the "Canaluvii montes" of Ptolemy.

CANDE′, in *Geography*, a town of France in the department of the Maine and Loire, and chief place of a canton, in the diſtrict of Segré, ten miles S.W. of Segré. The place contains 948, and the canton 6,343 inhabitants; the territory includes 285 kiliometres and 6 communes.

CANDEISH, a province of the ſouthern part of Hindooſtan, in the territory of the Poonah, or weſtern Mahrattas, being one of the three ſoubahs formed by Acbar in the 16th century out of the conqueſts in the Deccan. It occupies the ſpace between Malwa on the north, Berar on the eaſt, and Amednagur on the weſt and ſouth. Its ſoil is fertile, though mountainous, and it produces more cotton than any other province of Hindooſtan. The revenue of this province under Aurungzebe, as ſtated by Mr. Fraſer in his "Life of Nadir Shah," amounted to 112 lacs of rupees. The principal town is Burhanpour, which ſee.

CANDEL, and Candela, in *Botany*. See Rhizophora.

Candel, in *Geography*, a town of France, in the department of the Lower Rhine, and chief place of a canton in the diſtrict of Wiſſembourg; the place contains 2366, and the canton 13,424 inhabitants; its territorial extent comprehends 187½ kiliometres, and 16 communes.

CANDELA, a town of Naples, in the province of Capitanata; two miles S.W. of Aſcoli.

CANDELABRUM, in *Architecture*. This term, adopted from the Latin, is employed to denote the ſtands or ſupports, in common uſe among the ancients, to place their lamps upon; or which were hollowed out in the upper part, in the form of a braſier or baſon, for the combuſtion of inflammable ſubſtances.

Candelabra are among the elegant and ornamental remains of antiquity, and curious, as they preſerve the remembrance of primitive cuſtoms. The moſt ancient method of illuminating apartments during the night was apparently by burning dry and reſinous wood, either in braſiers, or more ſimply, by ſingle branches like flambeaux: the uſe of oil and of lamps ſucceeded to theſe imperfect and incommodious methods, and candelabra ſerved to ſupport the lamps.

In treating of Candelabra they are to be divided into the two general claſſes already intimated; thoſe which terminate in braſiers conſtitute the firſt, and thoſe which ſerved as lamp ſtands, the ſecond.

In the firſt claſs are comprehended the moſt remarkable for ſize and magnificence; ſome of theſe, which by their deſtination reſemble altars, and may even be confounded with them, were employed in temples and private chapels for burning incenſe. Cicero informs us, that not a houſe in Sicily was without theſe ſacred utenſils, made of ſilver. Candelabra of this kind are not unfrequently found repreſented in baſſo relievos and on the frizes of temples.

Very large marble candelabra are found at Rome, where, as Winckelmann obſerves, not one of bronze has been diſcovered; theſe from their great ſize and elevation correſpond to the vaſt halls of Roman edifices, which they illuminated.

The marble candelabra vary greatly in the ſhape, both of the braſier, and of the body or pillar which ſupports it; and many of them preſent models of taſte, in form, ornament, and execution. The richeſt collection of theſe objects is publiſhed in the *Muſæum Vaticanum:* two among theſe, which were found in the Barberini palace, are diſtinguiſhed as exquiſite ſpecimens of ornamental workmanſhip; the baſe is a triangular altar, having each face ornamented with a figure of a divinity; the ſhaft is compoſed of acanthus leaves diſpoſed in tiers in the ſtyle of a Corinthian capital, ſo that one of theſe candelabra appears, at firſt ſight, a union of three Corinthian capitals placed upon one another; the other, which is the moſt beautiful, is varied in form by a tuft of acanthus leaves, which fall over like a canopy with a wonderful richneſs of appearance. The baſon of both is fluted, and by its form and ornaments correſponds with the magnificence of the whole.

Our own country poſſeſſes many ancient candelabra, two of admirable workmanſhip were preſented to the Radcliffe library at Oxford, by Sir Roger Newdigate; they were found in the ruins of the emperor Adrian's palace at Tivoli.

Of the ſecond claſs of candelabra there is a very curious collection in the muſeum of Portici, which were found in the excavations of Herculaneum and Pompeii. They are all of bronze, and were uſed for domeſtic purpoſes. In many of theſe we find the ſhaft repreſenting a knotted cane, or a ſpiny branch, with truncated ſhoots and leaf ſtalks. They may be cited as examples of the taſte of the ancients, in adapting ornaments to things of common uſe, to augment their utility, and, at the ſame time, preſerve the type of the objects which give riſe to any uſeful invention. The buds and ſhoots repreſented ornament the ſhafts of the candelabra, which would otherwiſe be too plain; they are convenient in affording a firm graſp to the hand, and at the ſame time they appear to give the hiſtory and agreeably recal the ſimple origin of theſe utenſils. The ſame art which in ſtone and marble preſerved the original forms of the wooden hut, has perpetuated in bronze the reed or ſtaff, which ſupporting a tablet, formed the primitive candelabrum.

Among the conſiderable number of the candelabra in the muſeum of Portici there are many varieties. Their greateſt height is five feet. The ſhaft of one of theſe is ſquare, and on the upper part, immediately below the tablet upon which the lamp was placed, is repreſented a double head, one face of Mercury, and the other of Perſeus. The greater number are in the form of a column placed upon a ſpreading baſe, compoſed of three paws, and above the ſhaft is placed a circular tablet, forming the lamp ſtand. The ornaments are various; in ſome the ſhaft is fluted longitudinally; in others, the flutings are formed ſpirally; and there is equal diverſity in the capitals.

Candelabra of this kind are not employed by any modern European nation: the diſuſe of theſe elegant utenſils is owing to the circumſtance of candles having ſuperſeded lamps.

In Italy the practice of placing round the altar large chandeliers ſeemed to be an imitation of ancient cuſtoms in this reſpect; the ſize and the ſhape even of ſome of theſe chandeliers preſerve a tolerably juſt idea of the ancient candelabra, but they differ eſſentially from theſe in the ſocket neceſſary to receive the candle, and ſupport it in a ſtraight and immoveable poſition, and ſtill more in the choice of forms and taſte of ornament. The fineſt, or, at leaſt, the moſt rich and boaſted modern works of this kind, are the chandeliers of St. Peter's, the deſign of which is attributed to Michael Angelo. Notwithſtanding the name of this great artiſt, the richneſs of the material, and the beauty of the workmanſhip, it muſt be confeſſed that their form is too much divided, the ornaments are capricious, and their proportion very inſufficient for the ſituation which they occupy.

CANDELARES, in *Botany*, the ſixty-ſecond order in Linnæus's fragments of a natural method publiſhed in the Philoſophia Botanica. It conſiſted of Rhizophora, Mimuſops, and Nyſſa: but was afterwards aboliſhed by him, and its three genera referred to the Holeraceæ.

CANDELARIA, in *Entomology*, a ſpecies of FULGORA peculiar to China, that poſſeſſes the power of emanating a clear and vivid light from the extremity of its ſnout in a ſimilar manner to that emitted from the abdominal rings of our common glow-worm (*lampyris noctiluca*). It is ſpecifically diſtinguiſhed from the Fulgoræ, by having the ſnout aſcending: wing-caſes green with pale yellow ſpots; wings yellow, and black at the tip. Linn. Fabr. Donov. Inſ. China. See alſo article FULGORA.

CANDELARO, in *Geography*, a river of Naples, which runs into the ſea, 3 miles S. of Manfredona.

CANDERN, a town of Germany, in the circle of Suabia, and margraviate of Baden-Dourlach; 11 miles N.E. of Bâle, and 52 S. of Straſburgh.

CANDEROS, in the *Materia Medica*, a name of an Eaſt Indian gum not much known among us, though ſometimes imported. It has much the appearance of common amber, only that it wants its yellow colour, being white and pellucid; we ſometimes ſee it turned into toys of various kinds, which are very light, and of a good poliſh. Garcias and ſome other authors tell us, that Borneo, and ſome other places where camphor is produced, have the art of adulterating the crude camphor, which they ſend over to us, with large quantities of this gum.

CANDES, in *Geography*, a town of France, in the department of the Indre and Loire, and chief place of a canton in the diſtrict of Chinon, at the conflux of the Vienne and Loire; 2 leagues N.W. of Chinon.

CANDETTA, a ſmall iſland in the Adriatic, near the coaſt of Greece. N. lat. 39°. E. long. 21°.

CANDIA, a large iſland in the Mediterranean, anciently called *Crete*, (which ſee), is about 60 leagues in length, and about 13 at its greateſt breadth, and partly ſituated under the 35th degree of N. lat. and compriſed between 23° 30′ and 26° 30′ E. long. For the early hiſtory of this iſland, ſee CRETE. Its firſt foreign maſters were the Romans; who reduced it to the ſtate of a Roman province in conſequence of the conqueſt of Q. Cæcilius Metellus, hence ſurnamed "Creticus," or the Cretan, in the year 66 B. C. In this ſtate of ſubjection to the Romans, under the emperors of the Eaſt, it continued till the Saracens, who had ſettled in Spain, induced by the fertility and pleaſantneſs of this iſland, equipped a fleet for ſubduing it. Accordingly they landed in a convenient place, and for their ſecurity built and fortified a city, called "Chandax," or "Candax," ſignifying in their language "entrenchment," A. D. 812. From hence they made frequent excurſions, and, in ſpite of the efforts of Michael II. ſurnamed Balbus, or the Stammerer, they ſoon after reduced the whole iſland, and called it "Chandax," which was afterwards changed into Candia. In 962, Nicephorus Phocas drove the Saracens from this iſland, and reunited it to the empire of the Eaſt, of which it formed a part till the capture of Conſtantinople by the cruſaders in 1204. In recompence of the ſervices which the Venetians had rendered to Baldwin in the ſiege of this city, Candia, together with ſome other iſlands in the Archipelago, was given to them. In 1207, this iſland was ſubdued by the Genoeſe; and in 1211, Boniface, marquis of Montferrat, ſold it to the Venetians. In 1646, the Turks made a deſcent upon the iſland; and, having captured Canea, and proſecuting the ſiege of Candia, which was one of the moſt bloody and deſperate that was ever recorded in hiſtory, they compelled the Venetians to ſurrender it, A. D. 1669; and the whole iſland, a few fortreſſes excepted, was ceded to the conquerors. In 1715, the Turks made themſelves maſters of the Venetian forts; and ſince this time the whole iſland has belonged to them.

Sonnini ſuggeſts that, as the iſland of Candia extends from eaſt to weſt, whilſt the other iſlands of the ſame ſea lie, with reſpect to their length, in a north or ſouth direction, ſomewhat inclining towards the eaſt or weſt, it was detached from Africa by an inundation of the low lands which formerly united them: and this junction of Candia with the coaſt of Barbary acquires, he ſays, an additional degree of probability, when we direct our attention to the ſhallowneſs of the channel which ſeparates them, whoſe bottom every where affords ſoundings. Candia reſembles the other iſlands of this part of the Mediterranean, in having a chain of high mountains, called, from the ſnow that covers them in the winter, the "White Mountains," that traverſes its whole length. The iſland is divided into three pachaliks, or governments, the chief places of which are Candia, Canea, and Retimo. In the firſt of theſe towns is a pacha with three tails, ſeraſkier, or general in chief of all the forces of the iſland. In the other two is a pacha with two tails, independent of that of Candia, as to the adminiſtration of the police, but ſubject to him in every thing that concerns the military department. All three, in their turn, and in their reſpective provinces, ſuperintend the collection of the impoſt, and the ſafety of the places that are entruſted to them. They alſo cauſe juſtice to be done by the Cadis, and order their ſentences to be executed. Each pachalik is divided into a certain number of diſtricts, and each diſtrict compriſes a certain number of villages, of which ſome belong to the imperial moſques, and others to the ſultana-mother; and the greater number are granted for life to agas, or lords, in conſideration of a ſum of money paid into the imperial treaſury, and an annual quit-rent, which is lodged in the coffers of the treaſurer of Candia, for the maintenance of the fortreſſes and the pay of the troops of the country. All land owners pay to the aga, to the moſque, or to the ſultan, a ſeventh of the produce of their lands; and they are obliged to carry their olives to the mills, which the agas alone have a right to cauſe to be conſtructed. Oil pays a ſeventh. The police of the village belongs to the aga, who appoints, for ſubordinate adminiſtration, a ſoubachi, or ſubaltern tyrant, more greedy and more untractable than his maſter. No Greek can marry without the permiſſion of the aga, which is to be purchaſed by a preſent; and the aga ſometimes appropriates the female who is propoſed for marriage to himſelf; and when he wiſhes to part with her, he marries her to ſome Greek inhabitant of the village, who dares not refuſe her. Married men are not allowed to quit the iſland, unleſs they are mariners, or merchants; but bachelors may go to work in the Morea, or elſewhere, upon paying a tax of 60 parats, or two piaſtres a head before their departure. If a murder happen in a village, or within its territory, and the delinquent be unknown, the aga muſt pay to the pacha a ſum of money, which is levied on all the inhabitants, reſerving a part for himſelf. Taxes are arbitrary, and in their amount depend on the population and circumſtances of the inhabitants. For the death of a muſſulman, the fine is exorbitant, and is almoſt always attended by the death of ſeveral Greeks. The Turkiſh villages, as well as thoſe of the Greeks, are ſubject to the police of the aga; but thoſe which belong to moſques or to the ſultana-mother, are leſs oppreſſed than the others. The Greeks can neither occupy employments proceeding from the government, nor can they be admitted into any corps of troops, unleſs they have embraced the religion of Mahomet. Thus the iſland, which long proſpered under the laws of Minos, is now governed; and thus the inhabitants of a country where liberty in a manner took its birth, are bent under the yoke of the moſt ignominious ſlavery. Among the people, who at this day inhabit the iſland of Candia, we may reckon Abadiots, Muſſulmen by religion, Arabs by origin, and ſome remains of the Saracens whoſe anceſtors formerly occupied it. The Abadiots are ſwarthy, meagre, and of middling ſtature, and in their diſpoſition miſtruſtful, malicious, and vindictive; they always go armed like the Turks, and kill each other on the ſmalleſt provocation. They occupy 20 little villages to the ſouth of mount Ida, and form a population of about 4000 perſons. They afford an aſylum to the Turks and Greeks who have committed any crimes, whom they themſelves kill if they become troubleſome. When they have an opportunity, they rob the friars in the Greek monaſteries that lie within the reach of their villages. The inhabitants of the high mountains to the ſouth of Canea and Retimo are conſidered as the real deſcendants of the ancient Cretans, and are known by the name of "Sphachiots." They are diſtinguiſhed from the other Greeks by their tall ſtature, handſome look, love of liberty, courage, ſkill, and above all, by the hatred which they have vowed againſt the uſurpers of their iſland. Theſe Sphachiots have found means to preſerve their laws and their cuſtoms under the Romans, the Saracens, the Venetians, and the Turks. Obliged by the Turks to tranſport, in ſummer, from the tops of their mountains, the ice neceſſary for the conſumption of the inhabitants of Canea and Retimo, they paid no tax nor import; they had no agas; they never ſaw among them the agents of the Turkiſh government; and they formed a republic, in ſome meaſure independent, till, in 1769, the happineſs which they enjoyed on their mountains was interrupted by the part they took with the Ruſſians, and the Turks retaliated upon them their revolt by hoſtile meaſures that proceeded almoſt to their utter extermination. The amount of the population of this iſland conſiſting of Greeks and Turks is eſtimated by Olivier at 240,000.

The climate of Candia has from remote antiquity been deemed ſingularly healthful, which has been attributed to the abundance of its ſalutary plants. Hippocrates ſent his patients thither to breath the air charged with wholeſome vapours. The Turks in the iſland of Candia, under the happy influence of its climate, have there acquired a taller ſtature, muſcles more prominent and more ſtrongly marked, broader cheſt and ſhoulders, all the proportions which conſtitute beauty and ſtrength, together with an impoſing ſtep and carriage; although with all theſe advantages, the ſternneſs of their countenance gives to their majeſtic exterior a formidable impreſſion. The Greeks, on the other hand, are of a ſtature leſs tall, a corpulence leſs prominent, a ſtep leſs ſolemn, a make leſs robuſt, but more graceful; and they ſeem to have degenerated under a climate which is natural to them, and in which they are abandoned to ſlavery, which alike degrades both the form of the body and that of the mind. The ſame diſparity in the exterior attributes of the Turk and the Greek, is alſo obſerved among the women of the two nations. The Turkiſh women are there handſomer than in the other parts of the eaſt; whereas the female Greeks have, generally ſpeaking, fewer charms than they poſſeſs in ſeveral other countries. The dance of the Greeks of Candia is referred to a very remote antiquity. Homer (Il. l. xviii. ſub fin. Pope's verſion.) has deſcribed it; and it is the image of the labyrinth of Crete, of which it imitates the windings and turnings. It is ſerious and grave, though not deſtitute of ſimplicity and nobleneſs. Their ſongs are ſlow and languid, and the habit which the Greeks have of ſinging through the noſe renders their ſongs ſtill more drawling and leſs ſprightly.

With the exception of the leproſy brought to this iſland from Aſia, there are no contagious nor prevailing diſorders in Candia.

One of the beſt cultivated and moſt productive of the provinces of this iſland is *Kiſſamos*. To the ſouth of this province is *Selino*, to the north of theſe two provinces is *Cidonia*, and to the ſouth *Sphachia*. Three leagues from the town of Canea commences the province of *Apocorona*, which extends to the eaſt as far as *Armiro*, and to the ſouth as far as the mountains of Sphachia. This province is mountainous, and furniſhes abundance of oil, but a ſmall quantity of barley and wheat, and very little wine. It is more peopled by Greeks than by Turks. The province of *Retimo* is well cultivated and very productive. To the ſouth of this are the two provinces of *Aion-Vaſſali* and *Amari*, furniſhing wheat, barley, oil, and ſome fruits. The former, ſituate N.W. of the other, ſupplies alſo excellent cheeſe. In theſe provinces the Greeks are more numerous than the Turks. The firſt province that occurs in the north part of the iſland, after quitting the territory of Retimo, is called *Nilo-Potamo*. The province of *Candia* affords very little cotton, but abundance of wheat and barley, and a conſiderable quantity of raiſins, which laſt are ſhipped for the ſupply of Syria and Egypt. In this territory there are ſcarcely any olive-trees. The Turks are here as numerous as the Greeks. To the ſouth of Candia lies the province of *Meſſara*, which is reckoned the granary of Crete; and to the eaſt of Candia lies the province of *Mirabel*, to the ſouth of which is the province of *Hiera Petra*, or *Gera-Petra*. The province of *Settia* occupies the whole eaſtern part of the iſland. For a more particular account of each of theſe provinces, ſee Kissamos, Selino, &c.

Notwithſtanding the various alimentary productions furniſhed by this iſland, the Greeks live through the whole year on barley-bread, ſalted olives, and wild plants. The more delicate articles of ſubſiſtence they ſell in order to diſcharge the taxes, or to pay the too frequent extortions of their agas. Mutton and pork are every where excellent and cheap. Lambs and kids are likewiſe to be obtained in the three principal towns during ſeveral months of the year. The argali and wild goat are plentiful on the mountains. Beef is ſcarce, and the ox is little uſed but in rural labour. Poultry may be procured with eaſe, and at a cheap rate. Turkeys are ſold at a very moderate price; and the iſland abounds with a great variety of birds fit for food, as the quail, turtle, ring-dove, loriot, roller, thruſh, and fig-peckers. The woodcock paſſes the winter in this iſland, and the blackbird remains all the year. In ſpring and ſummer, larks, ortolans, and many ſmall birds ſupply the place of birds of paſſage. The hare and partridge are very common. There are few countries in the Levant that afford a greater variety of uſeful and intereſting vegetables than the iſland of Crete. Agriculture is ſubject to many diſcouragements and reſtraints in the iſland of Candia; and induſtry is checked by the oppreſſion and rapine of the agas, pachas, and janizaries. Such is more eſpecially the caſe in the villages and territories belonging to the Greeks. The Turks are leſs oppreſſed; and the Sphachiot, more ſure of enjoying the fruits of his labour, exerts a greater degree of energy and activity. Public granaries are very common near the principal towns; they were probably conſtructed in the time of the Venetians, and they conſiſt of large ſquare pits in maſonry, coated with a cement capable of ſecuring from moiſture the grain contained in them. The opening is narrow, and carefully cloſed. As the iſland does not grow a ſufficient quantity of corn for the ſupply of its inhabitants, a large quantity is annually imported from Volo, Salonica, the Morea, Syria, and Egypt. Wine is made only in a few diſtricts; in others, the inhabitants prefer carrying their grapes to the town, or drying them for trade. The mulberry-tree vegetates very well in Candia, and ſilk-worms thrive wonderfully; and yet the ſilk uſed in their meaneſt manufacture is brought from Syria. Some cloths, in ſilk and cotton, and in ſilk and flax, are manufactured and conſumed in the country. Flax, though tolerably plentiful, is not cultivated in ſufficient quantity for the uſe of the inhabitants; a great deal is drawn from Egypt. Cotton is little cultivated; that which is conſumed being brought from Smyrna and the environs of Epheſus. Seſamum is cultivated for the purpoſe of mixing its ſeed with bread, in order to give it flavour. One of the productions of Candia, which has preſerved its ancient reputation, is wine, which, in ſome diſtricts, is ſtill delicious. It is well known, that Homer has praiſed the wine of Crete, and that Jupiter drank no other nectar during his ſtay in this iſland. The malmſey, which is made in the environs of mount Ida, is much eſteemed; but all the Candian wines muſt be drank with caution, as they are of a fiery quality, and apt to fly quickly to the head and to ſhake the nerves. In ſeveral places foreſts of pines, cedars, and firs cover the declivity of the mountains, and crown the ſummit of the hills; and afford, by their ſtraight and tall ſtems, as well as by the reſin which exudes from them, abundant reſources for nautical purpoſes. On the mountains in the vicinity of Canea, and at the foot of mount Ida, grows a ſpecies of rock-roſe (*Ciſtus ladaniferus*, Linn.), which yields ladanum, or labdanum, ſerving for perfumes and the preparation of certain drugs. The horſes of Candia, the race of which originally came from Barbary, have much degenerated in form and beauty. Nevertheleſs, none can be compared to them for ſtrength and ſuppleneſs of limbs, and for being ſure-footed. The dogs of the iſland were formerly reckoned, on account of their fleetneſs and agility, the beſt in Greece, next to thoſe of Lacedæmonia. But, under the Turks, their race is degenerated. The dogs of Candia are a new ſpecies of large greyhounds, or courſing dogs, which, with a little attention, might be handſome animals; but in this land of tyranny and ſlavery theſe animals are neglected. It is ſaid that in Candia no carnivorous and ferocious animal exiſts; and it is certain that if ſuch quadrupeds once inhabited this iſland, their races have entirely diſappeared. But the ancients have blended exaggeration with their accounts, when they aſſert that birds of prey would not ſubſiſt here. It was alſo aſſerted, without foundation, that the iſland of Candia was exempt from ſerpents, and other venomous animals. Pliny, however, has made an exception in favour of the phalangium, or tarantula. Belon has obſerved, that three ſpecies of ſerpents were known here; and Sonnini ſays, that there exiſts a ſpecies of ſpider as dangerous as the tarantula, which lives in ſubterraneous retreats, and is of the ſpecies of the maſon, or mining ſpider, circumſtantially deſcribed by Latreille in the "Mem. de la Societe d'Hiſt. Nat." Whether the gecko (*lacerta gecko*, Linn.) be found on this iſland is not abſolutely certain; but it is not improbable, as it is met with in other countries of the eaſt, in the vicinity of the iſland of Candia, and particularly in Barbary and Egypt. The hydrophobia is ſaid to have occaſionally, though ſeldom, made its appearance in Candia; and Dapper mentions that this iſland has been frequently afflicted by mad dogs. The remedy purchaſed by the king of Pruſſia, and publiſhed in 1777, is known there. The inſect that furniſhed this ſpecific, which the Candiots employed from time immemorial as a ſovereign antidote to madneſs, is the *meloe*, or oil-beetle, (*Meloe proſcarabæus*, Linn.) the larva of which bears the name of "May-worm." In Candia it is reduced to powder, which the patient ſwallows; and it is ſaid to be of ſo active a nature, as to occaſion convulſions, pains in the bowels, inflammations, agony, bleedings at the noſe, bloody urine, and even death, when taken in too large a doſe. Such dangerous means of cure have been wiſely relinquiſhed by modern practitioners. The multiplication of bees is a branch of rural induſtry, which is encouraged in this iſland. The ancients indeed feigned that Jupiter had been fed on the honey obtained from the bees of mount Ida.

The only articles of exportation from this iſland are, oil, ſoap, wax, honey, cheeſe, raiſins, almonds, walnuts, cheſnuts, St. John's bread, linſeed, and liquorice-root. The imports ſupplied by the French conſiſt of woollen cloths, laces, and ſtuffs of Lyons, imperial ſerges of Niſmes, ſmall ſhot, tin, iron, ſteel, coffee, ſugar, nutmegs, cloves, indigo, cochineal, paper, and various articles of hard-ware. Venice and Trieſte ſupply glaſs-ware, hard-ware, and, particularly, planks for making ſoap-caſes; and Caramania, or Greece, furniſhes almoſt all the wood neceſſary for the ſoap-houſes. The iſlanders themſelves carry on ſome trade: from Salonica they draw corn, cotton, tobacco, and iron; from Conſtantinople, Burſa ſtuffs, Angora châlits, ſhoes, handkerchiefs, and copper utenſils. At Smyrna they take hides, Turkey leather or Morocco, cotton, quilted coverlids, Engliſh ſhaloons, and ſome French goods. At Gaza they take aſhes for their ſoap-houſes: at Aleppo, ſilk ſtuffs; and they purchaſe on the coaſt of Syria corn and ſilk. Egypt ſupplies them with corn and rice, flax, linen-cloths, and aſhes. Derna and Bengazi, on the coaſt of Africa, ſend butter known under the name of Mantegue, which is a mixture of butter and mutton-ſuet, uſed by the orientals in their ragouts and paſtry. Tunis and Tripoli exchange their caps and their corn for ſoap and ſequins. The wool is coarſe and ſhort, and wholly conſumed in the country. The hone is a well known article of commerce from Candia and Stancho.

The north coaſt of this iſland has the greateſt number of harbours and roadſteads; in which are many excellent anchorages; but the ſouth coaſt affords few places where a ſhip can reſt in ſafety. The rivers of the iſland are principally torrents ſwelled in winter by the rains, and in ſpring by the melting of the ſnow; but they have a conſiderable number of ſprings, which the inhabitants uſe for the watering of their lands. During the three ſummer months, the exceſſive heat of the ſun is conſtantly tempered every day, from eight or nine in the morning till the evening, by the rapid current of air which prevails from North to South on the northern coaſt of the iſland. This refreſhing wind, called "embat," takes its courſe, and is modified through the Levant, according to the direction of the coaſts and the extent of ſea which lies before them. In the iſland of Candia winter is, properly ſpeaking, no more than a rainy ſeaſon, during which the ſky is more charged with clouds, and the heat leſs powerful, but never ſuch as to make it neceſſary to have recourſe to artificial warmth. However, in this ſeaſon the mountains are covered with ſnow, and in ſome places it remains till the month of June. Sonnini's Travels in Greece, p. 209, &c. Olivier's Travels in the Ottoman Empire, vol. ii. p. 180, &c.

Candia, the *Khandak* of the Arabs, derived from *chandax* or *candax*, is a maritime town of the iſland above deſcribed, and, though leſs populous and commercial than *Canea*, reckoned its capital. Some geographers have ſuppoſed that its ſcite is that of the ancient *Cytæum*; others ſuppoſe it to have been *Matium*, and others again refer it to *Heraclea*. Olivier places Cytæum 4 leagues to the weſt, and Matium 2 leagues to the eaſt, and Heraclea 4 or 5 leagues to the eaſt; and Candia he imagines to have been port *Panormus*, which lay, according to Ptolemy, between Cytæum and Heraclea. Candia is ſituated on a pleaſant plain, interſected by beautiful hills, which ſhare its fertility, and the ground on which it ſtands is ſupported towards the ſea by a ſtrong wall built on rocks, which affords an agreeable walk. The approaches of the place are defended by ſea with ſeveral pieces of cannon, and it is guarded on the land ſide by walls of a ſolid conſtruction, a good ditch, and ſome advanced works. The form of the town, conſiſting of ſtraight ſtreets and regular ſquares, and the ſubſtantial conſtruction of the buildings, indicate that it is not the work of the Turks, but that it owes its exiſtence to the Venetians: at the ſame time its preſent ſtate announces the dreadful ravages of war, and the ſlower havock of want, ſo that the houſes conſtructed by them have diſappeared. Here are ſtill to be ſeen ruins which are the remains of the memorable ſiege which it ſuſtained for twenty-four years, from 1646 to 1670, againſt the Ottoman forces. The decline of its commerce has changed its flouriſhing ſtate and conſiderably reduced the number of its inhabitants, many of whom are removed to Canea, together with the foreign merchants. Although it is ſtill the ſeat of the general government of the iſland, its population is diſproportioned to its extent. It now contains ſcarcely 10 or 12000 Turks, 2 or 3000 Greeks, and about 60 Jews. The Greeks, who inhabited it before it became ſubject to the Turks, followed the Venetians at the time of its capitulation, and made their eſcape into the country: nor have they returned to ſettle in a town, where their exiſtence is inceſſantly threatened by the Janizaries, and their fortune frequently invaded by the Pachas. The handſomeſt churches damaged by the above-mentioned ſiege have been repaired and converted into moſques; but the fortifications have been carefully preſerved. To the ſouth-weſt of Candia, the firſt chain of mount Ida riſes in the form of a pyramid, and ſeems at a diſtance as a land-mark to navigators, who wiſh to anchor in the harbour of that town. The harbour is defended from the north wind by rocks, on which has been built a ſtrong jetty parallel to the coaſt: it is very ſecure; and might contain from 30 to 40 merchant-veſſels, if it were kept in proper order. But the Turks have ſuffered it to be choaked up, ſo that there are no more than eight or nine feet of water in the inſide of the harbour, and about 15 at its entrance. It affords accommodation only to a few ſmall barks of the country; and merchant-veſſels can only enter it in ballaſt, or with a fourth of their lading. To this and other circumſtances it is owing that the trade of Candia is almoſt annihilated. Navigators who frequent the harbour of Candia have been furniſhed by a long ſeries of obſervations with means of aſcertaining the ſtate of the atmoſphere in the open ſea, from the ſole inſpection of the chain of mountains which encircles the town to the ſouth. When the clouds collect in heaps above the moſt prominent of theſe hills, which bears the name of "Calepo," the weather is bad in the offing, and the wind almoſt always to the northward; navigators then take care not to quit the harbour. If, on the contrary, the ridge of the mountain is clear and free from vapours, they are certain of finding, without, the wind moderate and favourable for ſailing out of the gulf, and getting clear of the coaſt.

The environs of Candia preſent a few fertile plains that are cultivated, and ſome riſing grounds ſuſceptible of cultivation. At a little diſtance to the ſouth is ſeen the inſulated pyramidal mountain already mentioned, at the foot of which is a paſſage to the ruins of Gortyna, and its labyrinth: to the Europeans this mountain is known by the name of Jupiter's mountain. To the ſouth-weſt, mount Ida, covered with ſnow almoſt all the year, throws out on one ſide ſome branches towards the town; and, on the other, runs to join the mountains of Sphachia, covered in like manner with ſnow during eight or nine months. In this town there are 25 ſoap-houſes, which employ the greater part of the oils of the province, and of thoſe ſituated in the eaſt part of the iſland. Candia forms one of the three pachalicks of the iſland. See Candia. N. lat. 35° 19′. E. long. 25° 18′.

Candia, a town of Italy, in the Milaneſe; 12 miles W. of Vercelli.

Candia, a townſhip of America in Rockingham county, New Hampſhire, N. of Cheſter; about 36 miles W. of Portſmouth; incorporated in 1767, and containing 1040 inhabitants.

CANDIDA, in *Conchology*, a ſpecies of Arca, the ſhell of which is pellucid, rhomboid, produced in front, truncated behind, and decuſſated with ſtriæ; beaks remote; poſterior margin gaping, the opening ovate and ciliated. Chemnitz, &c. A native of the American and African ſhores. This kind is white, ſomewhat granulated, and covered with a blackiſh ſubfuſcous epidermis.

Candida, in *Zoology*, a ſpecies of Actinia, deſcribed by Mülleri as a native of the northern ſeas of Europe. This is ſmooth, with a rugoſe aperture, the tentacula reſembling briſtles, and diſpoſed at the margin.

CANDIDATE, a perſon who ſets up for ſome poſt or place, either of honour or profit.

The word is formed of *candidus*, white; on account of a white ſhining garment, *toga candida*, in which thoſe who aſpired to preferments in ancient Rome were habited, at the time of their appearing for the ſame, eſpecially at the public aſſemblies, in order to diſtinguiſh them from the crowd. The white gown worn by candidates was looſe and ungirded, nor was there any cloſe garment under it, which ſome interpret as done with deſign to avoid any ſuſpicion people might have of bribery; though Plutarch rather thinks it done to gain the affections of the people, by ſuing in ſuch an humble garb; or elſe that ſuch as had received wounds in the ſervice of their country, might more eaſily exhibit thoſe tokens of their courage and fidelity. The Roman candidates uſually declared their pretenſions a year before the time of election, which was ſpent in making intereſt and gaining friends. Various arts of popularity were practiſed for this purpoſe, and frequent circuits made round the city, and viſits and compliments to all ſorts of perſons, the proceſs of which formed what was called AMBITUS.

Candidate *of baptiſm*, in the *Ancient Church*, was called CATECHUMEN.

Candidates, in the College *of Phyſicians*, London, is the order of members, out of whom the fellows are choſen.

The candidates muſt be natives of England, doctors of phyſic, admitted to the degrees in our own univerſities, and ought to have practiſed phyſic four years before they are admitted into the order. The number of candidates is never to exceed twelve. See College.

Candidate, in *Academical Orders* or *Degrees*, denotes a perſon to whom, after full examination, and the performance of inaugural exerciſes, licence is granted to take up the higheſt or doctoral dignity when he pleaſes. See Degree, Doctor, Licentiate, &c.

Candidati *principis*, were thoſe who were recommended to any offices by the emperors. The *candidatus principis* was alſo an office in the court of the emperor of Conſtantinople, anſwering to a ſecretary of ſtate among us.

The *candidatus principis* was denominated *Quæſtor principis*, or *Auguſti*.

Candidati *milites*. Among the Romans, theſe were ſoldiers diſtinguiſhed by their figure, ſtature, and valour in combat. They were placed near the emperor, who was an eye-witneſs of their exploits. They ſerved him as his body-guards to protect and defend him. It is ſaid that Gordian the younger firſt inſtituted them as well as the Protectores and Scholares; which articles ſee.

CANDIDUM, in *Conchology*, a ſpecies of Buccinum, deſcribed by Martini. This ſhell is oblong, turbinated, ſolid, ſmooth, and white. Country uncertain.

Candidum, *promontorium*, in *Ancient Geography*, *Bas-el-Abeaoh*, a promontory of Africa, N. W. of that of Apollo; mentioned by Livy, Pliny, and Mela.

CANDIDUS, in *Entomology*, a ſpecies of Cerambyx, (*Saperda*, Fabr.) Colour white; thorax and body fuſcous, with two white ſtripes. Fabricius. The country of this inſect is unknown.

CANDIL, in *Commerce*, an Eaſt Indian weight equal to 540 pounds avoirdupois.

CANDIPATNA, in *Ancient Geography*, a town of India, on this ſide of the Ganges, in the country of the Arvarnians, according to Ptolemy.

CANDLE, a cotton or linen wick, looſely twiſted, and covered with tallow, wax, or ſpermaceti, in a cylindrical figure; which, being lighted at the end, ſerves to illuminate a place in the abſence of the ſun.

The word *candle* comes from *candela*, and that from *candor*, of *candeo*, *I burn*; whence alſo the middle age Greek [illegible].

A tallow candle, to be good, muſt be half ſheep's and half bullock's tallow; the fat of hogs makes them gutter, gives an ill ſmell, and a thick black ſmoke.

Tallow candles are of two kinds; the one dipped, the other moulded: the firſt, which are thoſe in ordinary uſe, are of an old ſtanding; the latter are ſaid to be the invention of the ſieur le Brez, at Paris. The manufacture of the two kinds is very different, excepting in what relates to melting of the tallow, and making the wick, which is the ſame in both.

Candles, *method of making*. The different kinds of tallow being weighed and mixed in their due proportion, are cut or hacked into pieces, to facilitate their melting, and thrown into a pot or boiler, having a cavity of ſome depth running round the top, to prevent its boiling over. Being thus perfectly melted and ſkimmed, a certain quantity of water is thrown in, proportioned to the quantity of tallow; this ſerves to precipitate the impurities of the tallow, which had eſcaped the ſkimmer, to the bottom of the veſſel. The tallow, however, intended for the firſt three dips, muſt have no water; becauſe, the dry wick imbibing the water readily, makes the candles ſpit and crackle in the burning. The melted tallow is now emptied through a ſieve into a tub, having a tap for letting it out, as occaſion requires. The tallow, thus prepared, may be uſed after having ſtood three hours; and will continue fit for uſe twenty-four hours in ſummer, and fifteen in winter. The wicks are made of ſpun cotton, which the chandlers buy in ſkeins; and they wind off three or four together, according to the intended thickneſs of the wick, into bottoms, or clues, from a certain number of which threads are drawn off, and then cut with an inſtrument contrived for that purpoſe, into pieces of the ſize and length of the candle required. The machine for cutting the cotton conſiſts of a ſmooth board adapted to reſt on the knees; (ſee *Plate*, *Candle-Making*, *fig.* 1.) on the upper ſurface of which are the blade of a razor, or a knife, A, and a pin or round piece of cane, B, placed at a certain diſtance from one another, according to the length of the cotton that is wanted: the cotton is then carried round the cane, B, and being brought to the razor, or knife, A, is inſtantly ſeparated from the ſeveral bottoms or balls. The next operation is that of "pulling the cotton," which is that of laying ſmooth the threads, removing all knots, &c. and thus rendering it fit for uſe. It is then put on the ſticks, or broaches, or elſe placed in the moulds, as the candles are intended to be either dipped or moulded. The broaches are rods about half an inch in diameter, and ſomewhat more than three feet long.

Candles, *making of dipped*. The liquid tallow is drawn off from the tub above mentioned, into a veſſel called the mould, ſink, or abyſs, of an angular form, perfectly like a priſm, except that it is not equilateral, the ſide on which it opens being only ten inches high; and the others, which make its depth, fifteen. On the angle, formed by the two great ſides, it is ſupported by two feet, and is placed on a kind of bench, in form of a trough, to catch the droppings, as the candles are taken out at each dip. At a convenient diſtance from this is ſeated the workman, who takes three ſticks, or broaches at a time, ſtrung with the proper number of wicks, viz. ſixteen, if the candles are to be of eight in the pound; twelve, if of ſix in the pound, &c. and holding them equidiſtant, by means of the ſecond and third finger of each hand, which he puts between them, he immerges the wicks two or three times for their firſt lay, and, holding them ſome time over the opening of the veſſel to let them drain, hangs them on a rack, or frame, where they continue to drain and grow hard. When cooled, they are dipped a ſecond time, then a third as before; only for the third lay they are immerged but twice, in all the reſt thrice. The operation is repeated more or leſs times, according to the intended thickneſs of the candles. With the laſt dip they neck them; i. e. plunge them below that part of the wick where the other lays ended. Such as we have above deſcribed uſed to be the laborious method of making common candles; till within 15 or 20 years paſt, when an invention was introduced which ſerved very much to diminiſh the labour and to facilitate the operation. This method of making dipped candles, as now practiſed by the manufacturers in London, is as follows: the wicks prepared as above are hung at equal diſtances upon the broaches; and when five of theſe are filled, they are put into holes in two pieces of wood, C, D, (*fig.* 2.); thus forming a frame full of wicks. The veſſel, A, (*fig.* 1.) is then filled with melted tallow. This veſſel is made of lead, and has a hole, B, under it for receiving a chaffing-diſh to keep the tallow warm; on each ſide of the veſſel are two leaves, C, D, for catching the droppings of the candles as they are dipped; over the veſſel is ſuſpended from the ceiling a framed lever, K, K, with two arched heads, L, L, at each end, in order to give a vertical motion to the ſcale, I, and frame, EFGH, the two croſs pieces, E, F, of which are for the leaves, C, D, of *fig.* 2. to reſt upon. The dipper then lays hold of the upper bar at G and H, and gently puſhes down the wicks into the melted tallow, and keeps them down till he finds that, by the tallow adhering to them, they are heavier than the weight in the ſcale I, previouſly adjuſted to the proper weight. The frame of candles is then removed and hung up to cool, which takes ſome days, according to the ſtate of the weather. When they are quite ſtiff, they are dipped again with a heavier weight in the ſcale I, and this operation is continued, till they are of the proper ſize. The workman, by means of this ſimple contrivance, has only to guide the broaches and candles, and not to ſupport the weight of them as in the old method.

It muſt be obſerved, that during the operation the tallow is ſtirred from time to time, and the ſtock ſupplied with freſh tallow. When the candles are finiſhed, their peaked ends, or bottoms, are taken off; not with any cutting inſtrument, but by paſſing them over a kind of flat brazen plate, heated to a proper pitch by fire underneath, which melts down as much as is requiſite.

Candles, *method of making mould.* Theſe candles are made in moulds of different materials; that generally uſed is pewter. Each candle has its mould, conſiſting of three pieces, the neck, ſhaft, and foot: the ſhaft is a hollow pewter cylinder, B, (*fig.* 6.) having the end *a* ſomewhat ſmaller than the other, that the candle may ſlide out eaſily, of the diameter and length of the candle propoſed; at the extremity of this is the neck, A, which is a little metallic cavity, in form of a dome, having a moulding withinſide, and pierced in the middle with a hole big enough for the wick to paſs through. At the other extremity is the foot, in form of a little tunnel, through which the liquid tallow runs into the mould. The neck is ſoldered to the ſhaft, but the foot is moveable, being applied when the wick is to be put in, and taken off again when the candle is cold. A little beneath the place where the foot is applied to the ſhaft, is a kind of ſtring of metal, which ſerves to ſupport that part of the mould, and to prevent the ſhaft from entering too deep in the table to be mentioned hereafter. Laſtly, in the hook of the foot, is a leaf of the ſame metal, ſoldered within ſide, which, advancing into the centre, ſerves to keep up the wick; which is here hooked on, preciſely in the middle of the mould. The wick is introduced into the ſhaft of the mould by a piece of wire, which being thruſt through the aperture of the hook, till it come out at the neck, the wick is tied to it; ſo that in drawing it back, the wick comes along with it, leaving only enough a-top for the neck; the other end is faſtened to the hook, which thus keeps it perpendicular, E E (*fig.* 5.) Ten or fifteen of theſe moulds, in this condition, are fixed in a frame pierced full of holes, the diameter of each being about an inch, by a ſcrew at the top of each mould, which attaches them to the upper board B of the frame. This board has three upright ſides and one ſloping, which forms a ſmall ciſtern for the tallow. When every mould in the frame has been provided with a wick, two wires, *c c*, (*fig.* 5.) are paſſed through the two ends of the ciſtern at the top of the frame, and the loops of the ſeveral wicks. The ends of the wicks which hang out of the mould are pulled tight, their tops are put over the centers of the moulds, and the friction of the mould keeps them in this poſition. Theſe moulds are filled with tallow out of a ciſtern, A (*fig.* 4.) the outſide of which is wood, and lined with lead; within which is another ciſtern of lead for containing the melted tallow, prepared as above, with about two inches ſpace between them all round to be filled with hot water for keeping the tallow warm. In the bottom of the veſſel are three ſmall ſhuttles, B, C, D, communicating with the inner veſſel, and ſerving to fill the moulds, E E, before deſcribed. After the frame is filled and the tallow has acquired its due conſiſtence, the two wires, *c c*, are withdrawn, and the looſe tallow in the ciſtern at the top of the frame ſcraped out; they are ſet out in the open air to cool, and when thoroughly cold, the candles are pulled out of the mould by a bodkin put through the loops of the wicks where the wires, *c c*, paſſed before.

Thoſe who aim at perfection in their work, bleach or whiten their candles, by faſtening them on rods or broaches, and hanging them out to the dew, and earlieſt rays of the ſun, for eight or ten days: care being taken to ſcreen them in the day-time from the too intenſe heat of the ſun, and in the night from rain, by waxed cloths. Tallow-chandlers make other candles, which are intended to burn during the night without the neceſſity of being ſnuffed. The wick of theſe has been uſually made of ſplit ruſhes; but of late, very ſmall cotton wicks have been ſubſtituted for the ruſh; theſe are much more eaſily lighted, are leſs liable to go out, and, on account of the ſmallneſs of the cotton wick, they do not require the aid of ſnuffers. The price of candles uſed formerly to be regulated by the maſters and wardens of the tallow-chandlers' company, who were accuſtomed to meet at their hall every month for the purpoſe; but now the price of every article belonging to the trade is fixed at the weekly markets.

Candles, *wax*, are made of a cotton or flaxen wick, ſlightly twiſted, and covered with white or yellow wax. Of theſe there are ſeveral kinds; ſome called tapers, uſed to illuminate churches, and in proceſſions, funeral ceremonies, &c. and others uſed on ordinary occaſions.

As to the firſt kind, their figure is conical, ſtill diminiſhing from the bottom, which has a hole to receive the point in the candleſtick, to the top, which ends in a point: the latter kind are cylindrical. The firſt are either made with a ladle, or with the hand.

Candles, *wax, manner of making with the ladle.* The wicks being twiſted, and cut off at the proper length, a dozen of them are tied by the neck, at equal diſtances, round an iron circle, ſuſpended directly over a large baſon of copper tinned, and full of melted wax: a large ladle full of this wax is poured gently, by inclination, on the tops of the wicks, one after another; ſo that running down, the whole wick is thus covered; the ſurplus returning into the baſon, where it is kept warm by a pan of coals underneath it. They thus continue to pour on the wax, till the candle arrive at its deſtined ſize: ſtill obſerving, that the three firſt ladles be poured on at the top of the wick, the fourth at the height of $\frac{3}{4}$, the fifth at $\frac{1}{2}$, and the ſixth at $\frac{1}{4}$: by which means the candle arrives at its pyramidal form. The candles are then taken down hot, and laid aſide of each other, in a feather-bed folded in two, to preſerve their warmth, and keep the wax ſoft: they are then taken and rolled, one by one, on an even table, uſually of walnut-tree, with a long ſquare inſtrument of box, ſmooth at the bottom. The candle being thus rolled and ſmoothed, its big end is cut off, and a conical hole is made in it.

Candles, *wax, manner of making by the hand.* The wick being diſpoſed, as in the former, they begin to ſoften the wax, by working it ſeveral times in hot water, contained in a braſs caldron, tinned, very narrow and deep. A piece of the wax is then taken out, and diſpoſed, by little and little, around the wick, which is hung on a hook in the wall, by the extremity oppoſite to the neck; ſo that they begin with the big end, diminiſhing ſtill, as they deſcend towards the neck. In other reſpects, the method is the ſame here as in the former caſe; only that they are not laid in the bed, but are rolled on the table, juſt as they are formed. It muſt be obſerved, however, that in the former caſe, water is always uſed to moiſten the ſeveral inſtruments, to prevent the wax from ſticking; and in the latter, lard, or oil of olives, for the hands, table, &c.

Candles, *wax cylindrical,* are made either with the ladle, or drawn. The firſt kind are made of ſeveral threads of cotton, looſely ſpun, and twiſted together, covered with the ladle, and rolled, as the conical ones, but not pierced.

Candles, *wax, drawn,* are ſo called, becauſe actually drawn, in the manner of wire, by means of two large rollers, or cylinders of wood, turned by a handle, which turning backwards and forwards ſeveral times, paſs the wick through melted wax, contained in a braſs baſon; and at the ſame time through the holes of an inſtrument, like that uſed for drawing wire, faſtened at one ſide of the baſon: ſo that, by little and little, the candle acquires any bulk, at pleaſure, according to the different holes of the inſtrument through which it paſſes: by this method, may four or five hundred ells at length be drawn, running. The invention of this was brought from Venice by Pierre Bleſimare of Paris, about the middle of the 17th century.

The aſcent of the tallow up the wick in a burning candle, may be reſolved into the ſame principle of filtration, or attraction, as that of water up a heap of aſhes, or even up a capillary tube. The wick of a candle is but ſlightly twiſted, that all its hairs may be eaſily come at; which being very ſmall, ſoon take the flame: and the flame by its heat rarefying the air, and diſſolving the tallow underneath, makes the globules thereof aſcend into the rarefied ſpaces of the wick, and theſe, with the air about it, prove food for the flame.

A patent was granted in 1799, to Mr. William Bolts of London, for new modes of improving the form, quality, and uſe of candles. The moſt material alteration in Mr. Bolts's invention from the common method of making candles, conſiſts in ſaving the greater part of the wick by rendering it moveable; and for this purpoſe it is kept conſtantly ſoaking in the tallow as it melts, ſo that the cotton is conſumed very ſlowly as in lamps fed with oil. The patentee employs two methods for accompliſhing this object; one is that of making candles entirely ſolid, without any wick paſſing through them; and applying the wick, which is very ſhort, upon the top of the ſolid candle, where it burns like that of a lamp; the heat which it affords when firſt lighted being ſufficient to furniſh the firſt ſupply of melted tallow, and to continue it as long as any part of the candle remains unconſumed. In order to keep the wick conſtantly applied, it is faſtened to a ſmall projecting ſpring, into which it is firmly fixed; and the ſurface of the candle is always kept in contact with the wick, either by cauſing the wick ſtand to paſs round the candle like a collar, which moving freely on the candle, will ſink in proportion as this is conſumed, or by making the wick ſtand immoveable, and putting a ſpiral ſpring at the bottom of the candleſtick, which conſtantly protrudes the candle upwards againſt the wick in proportion as the tallow is conſumed. His ſecond method of conſtructing the candles is that of forming them in the uſual ſhape, but with a perforation through their whole length; and the wick in this caſe is a ſmall tuft of cotton, which is put into the opening at the top of the hollow candle, and to its lower part is attached a thread which paſſes down through the perforation to the bottom of the candle, where it penetrates the candleſtick, and is wound round a key or pivot, and by turning this pivot, the wick that is attached to the upper part of the thread will be pulled down in proportion as the candle conſumes. This method prevents the guttering of candles, as all the tallow that is melted is readily abſorbed by the wick. By a ſmall variation in the form of the candle, it may be made to ſerve the purpoſe of an Argand's lamp; for which end it is compoſed of a hollow cylinder of tallow, including another cylinder alſo perforated; and the wick, which is of a circular form, is here placed between the inner and outer cylinders. In all theſe caſes, the wick is compoſed of thread, placed longitudinally, and not twiſted, as is the caſe with the common wicks, which undoubtedly aſſiſts the capillary attraction of the melted tallow. Theſe wicks have alſo the advantage of not requiring to be ſnuffed, for removing the carbonaceous matter which eſcapes unconſumed from the tallow. Another advantage attending theſe detached wicks, is the eaſe with which their bulk may be proportioned to that of the candle, and to the fuſibility of the material of which it is compoſed. The patentee alſo propoſes another improvement, which is that of ſubjecting the melted tallow or other material to a conſiderable preſſure, during the act of cooling; which is done by means of a condenſing machine, preſſing the ſurface of the liquid ſubſtance, and then giving it a greater degree of firmneſs and ſolidity when cold. The patentee has likewiſe deſcribed, and illuſtrated by a drawing, the contrivance which he has adopted for caſting the hollow cylindrical candles. For a detail of other circumſtances that occur in his patent, we refer to his ſpecification in the Repertory, vol. xii. p. 368.

Candles, *laws relating to.* Every maker of candles for ſale, other than wax candles, ſhall take out an annual licence at 1l. 24 Geo. III. c. 41. 43 Geo. III. c. 69. And every perſon making wax or ſpermaceti candles ſhall take out a licence at 6l., and for dealing in, or ſelling ſuch candles ſhall pay 10s. 6d., and renew the ſame annually, under a penalty of 20l. 24 Geo. III. c. 36. 43 Geo. III. c. 69. But no perſon who hath paid ſuch licence duty for making, ſhall be obliged to take out a licence for ſelling alſo, during the ſame year. 24 Geo. III. c. 41. By 24 Geo. III. c. 74., no perſon, reſiding within the limits of the head-office, ſhall be permitted to make candles, unleſs he occupy a tenement of 10l. a year, aſſeſſed in his own name, and for which he pays the pariſh rates; and elſewhere, unleſs he be aſſeſſed and pay to church and poor. By 43 Geo. III. c. 69., in lieu of any ſubſiſting duties of exciſe, the following duties are impoſed; viz. for every pound avoirdupois of candles, except thoſe of wax and ſpermaceti, made in Great Britain, 1d.; and for every pound of wax or ſpermaceti candles ſo made, $3\frac{1}{2}$d. All places for making or keeping of candles, and of materials for the ſame, and furnaces, moulds, &c. for melting ſuch materials, are forbidden to be uſed without notice previouſly given in writing at the next office of exciſe, under a penalty of 50l., and forfeiture of all candles and materials, furnaces, &c. which have not been entered. 8 Ann. c. 7. And by 11 Geo. c. 30., makers of candles who make uſe of ſuch places or utenſils without entry incur a forfeiture of 100l. Officers ſhall be permitted, at all times by day, and alſo in the night with a conſtable, to enter the houſe, melting-houſe, &c. of a maker of candles, and to take an account of the quantity, when all cheſts, &c. ſhall be opened; and the penalty of obſtructing or moleſting ſuch officer is 100l.; or if candles, &c. be found in unentered places, the offender ſhall be convicted in the penalty of 100l. 11 Geo. c. 30.; ſee alſo 24 Geo. III. c. 11. and 27 Geo. III. c. 31. Any maker of candles ſhall give notice in writing to the proper officer of his intention to begin a courſe of dipping and preparing for the ſame, with a declaration of the time when he intends to commence his operation, and a ſpecification of the number of ſticks, moulds, &c. which he propoſes to uſe, under a penalty of 50l. 10 Ann. c. 26. 11 Geo. c. 30. 24 Geo. III. c. 11. Such notice ſhall be given, within the limits of the head-office, 6 hours, within any city or market town, 12 hours, and elſewhere 24 hours, before he ſhall begin, on pain of forfeiting 50l. 25 Geo. III. c. 74. If he does not begin and proceed at the time mentioned, or within 3 hours next after, ſuch notice ſhall be void. Having begun, he ſhall continue working without interruption, till the whole courſe is finiſhed, on pain of forfeiting 50l. 26 Geo. III. c. 77. Every candle-maker ſhall provide ſufficient locks and faſtenings to every furnace, copper, mould, &c. to be ſecured by the officer, when they are not uſed; and he ſhall give notice in writing to the ſaid officer, 6 hours before the time when he wiſhes to uſe them, within the limits of the chief office, 12 hours in any market town, and 24 hours elſewhere; any offence againſt the proviſions of this act incurs a penalty of 100l. 27 Geo. III. c. 31. The officer ſhall charge for materials that are miſſing, after he has taken account of the ſame; and obſtruction incurs a forfeiture of 20l. Candles that are ſpoiled in making ſhall be defaced by the officer, and he ſhall make allowance for the duty. No maker of candles ſhall, on pain of 20l., remove candles before they are ſurveyed; and thoſe that have not been ſurveyed are to be kept ſeparate from the others, on pain of 5l. 8 Ann. c. 9. On ſuſpicion, that candles are privately made, or concealed to evade the duty, the ground of which has been ſtated on oath before two commiſſioners or one juſtice reſiding near the place, the officer may be empowered by ſpecial warrant, granted by ſuch juſtices or commiſſioners, to enter the place ſuſpected, and to ſeize as forfeited all candles that are found, and all materials for making them; and the perſon ſo offending, or obſtructing the officer, ſhall forfeit 100l. 5 Geo. III. c. 43. 23 Geo. II. c. 24. If any chandler ſhall mingle candles not weighed by the officer with thoſe that have been weighed, or remove any before weighing, or conceal any candles or materials, he ſhall forfeit 100l. 11 Geo. c. 30. Any perſon who is found aſſiſting in privately making candles ſhall forfeit 20l.; and every perſon making candles ſhall once in every week enter the ſame in writing at the next exciſe-office, with their weight, number, ſize, and quantity; on pain for every neglect of entry to forfeit 20l.; and in one week, after ſuch entry, he ſhall clear off the duties, on pain of double duty, nor ſhall he carry out candles till the duty hath been paid, on pain of double value. 25 Geo. III. c. 74. Perſons buying, receiving, or having in their poſſeſſion candles, not charged with the duty, ſhall forfeit the ſame, and treble value. 26 Geo. III c. 77. Nor ſhall any perſon expoſe to ſale any candles, unleſs in his public ſhop or warehouſe, public fair or market, on pain of 5l. 8 Ann. c. 9. No candles ſhall be imported, otherwiſe than in ſome package containing at leaſt 224lb. of neat candles, on pain of being ſeized and forfeited, and the maſter of the veſſel ſhall forfeit 50l. 23 Geo. II. c. 21. 42 Geo. III. c. 93. And no candles imported otherwiſe than according to 23 Geo. II. c. 21., ſhall be entered for exportation. 42 Geo. III. c. 93. All wax candles ſeized on importation or otherwiſe, and condemned for non-payment of the duties, ſhall be rendered unfit for uſe. 24 Geo. III. c. 36. Candles for which the duty hath been paid may be exported, with a draw-back of the duty. 8 Ann. c. 9. 43 Geo. III. c. 69. If any maker of candles ſhall obſtruct any officer in the execution of the powers given him by any act for ſecuring the duties on candles, he ſhall for every ſuch offence forfeit 100l. 24 Geo. III. c. 11. Every maker ſhall keep juſt ſcales and weights, and permit and aſſiſt the officer in the uſe of them, on pain of 10l. 8 Ann. c. 9.; and if he uſe ſcales and weights that are inſufficient, he ſhall forfeit 100l. 10 Geo. III. c. 44.; and by 28 Geo. III. c. 37., the ſame ſhall be forfeited, and may be ſeized by any officer of exciſe. Obſtruction of the officer in weighing or the hindrance of his taking a juſt account of ſtock, ſubjects to a forfeiture of 100l. 26 Geo. III. c. 77.

CANDLES, *Obſervations on the manufacture, comparative value, and uſe of different.* The Roman candles were at firſt little ſtrings dipped in pitch, or ſurrounded with wax; though afterwards they made them of the papyrus, covered likewiſe with wax; and ſometimes alſo of ruſhes, by ſtripping off the outer rind, and only retaining the pith. For religious offices, wax candles were uſed; for vulgar uſes, thoſe of tallow. Serv. ad. Æn. l. i. v. 731. Plin. Nat. Hiſt. l. xvii. c. 37. Lord Bacon propoſes candles of divers compoſitions and ingredients, and alſo of different ſorts of wicks; with experiments on the degrees of duration, and light of each. Good houſewives are ſaid to bury their candles in flour, or bran, which, it is ſaid, increaſes their durability, almoſt one half. Some ſpeak of perpetual candles made of Salamander wood. Bac. Nat. Hiſt. Cent. 4. c. 369. and Cent. 8. c. 744.

The two ſubſtances moſt commonly uſed in the manufacture of candles are wax and tallow. Wax owes its whiteneſs, and the greater conſiſtency it acquires, to an abſorption of the vital part of the atmoſphere; and in this circumſtance it ſeems principally to differ from tallow, or concrete oil. But as wax is already combined with a portion of vital air or oxygene, it does not burn with ſo luminous a flame as tallow or oil. But it poſſeſſes a very great advantage in the fabrication of candles, ariſing from its freezing point being placed at a conſiderably higher temperature than that of the other ſubſtance. Tallow melts at the 92d. degree of Fahrenheit's thermometer; ſpermaceti at the 133d. degree; and bleached wax at 155°. Hence it will not be difficult to explain the chief advantage of wax candles compared with thoſe of tallow. Oils, it ſhould be conſidered, do not take fire, unleſs they be previouſly volatilized by heat: and this is effected by means of the wick of a candle, or lamp. The oil riſes between the fibres of the wick by the capillary attraction. Heat, being applied to the extremity of the wick, volatilizes and ſets fire to a portion of the oil. While this is diſſipated by combuſtion, another portion paſſes along the fibres, or ſupplies its place by becoming heated and burned likewiſe. In this way a conſtant combuſtion is maintained. A candle, however, differs from a lamp in one very eſſential circumſtance; viz. that the oil, or tallow, is liquefied only as it comes to be in the vicinity of the conflagration; and this fluid is retained in the hollow of the part, which is ſtill concrete, and forms a kind of cup. The wick, therefore, ſhould not, on this account, be too thin; becauſe if this were the caſe, it would not carry off the fluid as faſt as it becomes fuſed; and the conſequence would be, that it would run down the ſides of the candle: and as this inconvenience ariſes from the fuſibility of the oil, it is plain that a more fuſible candle will require a larger wick; or that the wick of a wax candle may be made thinner than that of one of tallow. The flame of a tallow candle will of courſe be yellow, ſmoky, and obſcure, except for a ſhort time after ſnuffing. When a candle with a thick wick is firſt lighted, and the wick ſnuffed ſhort, the flame is perfect and luminous, unleſs its diameter be very great; in which laſt caſe, there is an opake part in the middle, where the combuſtion is impeded for want of air. As the wick becomes longer, the interval between its upper extremity, and the apex of the flame is diminiſhed; and conſequently the oil, which iſſues from that extremity, having a leſs ſpace of ignition to paſs through, is leſs completely burned, and paſſes off partly in ſmoke. This evil increaſes, until at length the upper extremity of the wick projects beyond the flame and forms a ſupport for an accumulation of ſoot which is afforded by the imperfect combuſtion, and which retains its figure, until, by the deſcent of the flame, the external air can have acceſs to the upper extremity. But in this caſe, the requiſite combuſtion which might ſnuff it, is not effected; for the portion of oil emitted by the long wick is not only too large to be perfectly burned, but alſo carries off much of the heat of the flame, while it aſſumes the elaſtic ſtate. By this diminiſhed combuſtion, and increaſed efflux of half-decompoſed oil, a portion of coal or ſoot is depoſited on the upper part of the wick, which gradually accumulates, and at length aſſumes the appearance of a fungus. The candle does not then give more than one-tenth of the light which the due combuſtion of its materials would produce; and, on this account, tallow candles require continual ſnuffing. But if we direct our attention to a wax candle, we find that as its wick lengthens, the light indeed becomes leſs. The wick, however, being thin and flexible, does not long occupy its place in the centre of the flame; neither does it, even in that ſituation, enlarge the diameter of the flame, ſo as to prevent the acceſs of air to its internal part. When its length is too great for the vertical poſition, it bends on one ſide; and its extremity, coming in contact with air, is burned to aſhes; excepting ſuch a portion as is defended by the continual afflux of melted wax, which is volatilized, and completely burned, by the ſurrounding flame. Hence it appears, that the difficult fuſibility of wax renders it practicable to burn a large quantity of fluid by means of a ſmall wick; and that this ſmall wick, by turning on one ſide in conſequence of its flexibility, performs the operation of ſnuffing upon itſelf, in a much more accurate manner than it can ever be performed mechanically. From the above ſtatement it appears, that the important object to ſociety of rendering tallow candles equal to thoſe of wax, does not at all depend on the combuſtibility of the reſpective materials, but upon a mechanical advantage in the cup, which is afforded by the inferior degree of fuſibility in the wax: and that, in order to obtain this valuable object, one of the following effects muſt be produced: either the tallow muſt be burned in a lamp, to avoid the gradual progreſſion of the flame along the wick; or ſome means muſt be deviſed to enable the candle to ſnuff itſelf, as the wax-candle does; or the tallow itſelf muſt be rendered leſs fuſible by ſome chemical proceſs. With a view to the firſt of theſe objects, a cylindrical piece of tallow was inſerted into a metallic tube, the upper aperture of which was partly cloſed by a ring, and the central part occupied by a metallic piece nearly reſembling that part of the common lamp which carries the wick. This piece was provided with a ſhort wick. The cylinder of tallow was ſupported beneath in ſuch a manner that the metallic tube and other part of this lamp were left to reſt with their whole weight upon the tallow at the ring or contraction of the upper aperture. In this ſituation the lamp was lighted, and it burned for a conſiderable time with a bright clear flame, more uniformly intenſe than that of a candle, and ſuperior to the ordinary flame of a lamp in its colour and the perfect abſence of ſmell. After ſome minutes it began to decay, and ſoon afterwards went out. Upon examination it was found, that the metallic piece which covered the wick had fuſed a ſufficient quantity of tallow for the ſupply during the combuſtion; that part of this tallow had flowed beneath the ring, and to other remote parts of the apparatus, beyond the influence of the flame; in conſequence of which, the tube and the cylinder of tallow were faſtened together, and the expected progreſſion of ſupply prevented. In every lamp for burning conſiſtent oils, it ſeems probable, ſays Mr. Nicholſon (ubi infra,) that the materials ought to be ſo diſpoſed as to deſcend to the flame upon the principle of the fountain reſervoir. Although this conſtruction failed, a contrivance of a ſimilar nature would be of very great public utility. With regard to the ſecond object above ſpecified, Mr. Nicholſon is led by various conſiderations to imagine, that the ſpontaneous ſnuffing of candles made of tallow or other fuſible materials, will ſcarcely be effected but by the diſcovery of ſome material for the wick, which ſhall be voluminous enough to abſorb the tallow, and at the ſame time ſufficiently flexible to bend on one ſide. The moſt promiſing ſpeculation reſpecting this moſt uſeful article, ſeems to regard the cup which contains the melted tallow. This is apt to break down by fuſion, and thus to ſuffer its fluid contents to eſcape. The Chineſe have a kind of candle about half an inch in diameter, which, in the harbour of Canton, is called a "lobchock." The wick is of cotton, wrapped round a ſmall ſtick or match of the bamboo cane. The body of the candle is white tallow; but the external part to the thickneſs of about one thirtieth of an inch conſiſts of a waxy matter coloured red; this covering gives a conſiderable degree of ſolidity to the candle and prevents its guttering, becauſe it is leſs fuſible than the tallow itſelf. The ſtick in the middle might probably be of advantage in throwing up a leſs quantity of oil into the flame than would have been conveyed by a wick of cotton ſufficiently ſtout to have occupied its place unſupported in the axis of the candle. Mr. Nicholſon ſays that he formerly made a candle in imitation of the "lobchock." For this purpoſe he adapted the wick in the uſual pewter mould; he then poured in wax, which was immediately afterwards poured out; the film of wax, adhering to the inner ſurface of the mould, ſoon became cool; and the candle was completed by filling the mould with tallow. When it was drawn out, it was found to be cracked longitudinally on its ſurface, which he attributed to the contraction of the wax, by cooling, being greater than that of the tallow: or it might have been owing to the too ſudden cooling of the wax before the tallow was poured in. The experiment was not repeated. After all, the moſt deciſive remedy for the imperfection of this cheapeſt, and in other reſpects beſt material for candles, would undoubtedly be a diminution of its fuſibility: with this view Mr. Nicholſon made ſome experiments. The object is, in a commercial view, entitled to aſſiduous and extenſive inveſtigation. Chemiſts in general, ſuppoſe the hardneſs or leſs fuſibility of wax to ariſe from oxygen; and to this object attention ſhould be directed in the inquiry. Nicholſon's Firſt Principles of Chemiſtry, p. 517. Nicholſon's Journal, Vol. I. p. 70.

The Chineſe obtain from the tallow tree (*Croton ſebiferum*, Linn.) a kind of vegetable fat, with which they make a conſiderable proportion of their candles; which are firmer than thoſe of tallow, and free from all offenſive odour; but they are not equal to thoſe of wax, or ſpermaceti. Cheap candles are alſo made of tallow, and even of greaſe of too little conſiſtence to be uſed, without the contrivance of being coated with the firmer ſubſtance of the tallow tree or of wax. The ſurface of theſe candles is ſometimes painted red. Their wicks are made of different materials. For their lamps, they uſe the amianthus, which burns without being conſumable in fire, or the artemiſia, and carduus marœus, with which tinder is alſo made; but for candles, they uſe a light inflammable wood, in the lower extremity of which is pierced a ſmall tube to receive an iron pin, which is fixed on the flat top of the candleſtick, and thus ſupports the candle, without the neceſſity of a ſocket. The candle-makers at Munich have for ſeveral years paſt prepared tallow candles with wooden wicks, which afford about the ſame quantity of light as a wax candle, burn alſo with great ſteadineſs and uniformity, and never crack or run. Theſe wicks are formed of very thin ſlips of wood, bound round to a conſiderable thickneſs with very fine unſpun cotton, but ſuch that the ſize of the wick does not much exceed that of the wick of a common candle. The candle-makers either purchaſe or prepare for themſelves theſe ſlips of wood, which are ſomewhat ſquare and not completely rounded, and are made of pine, willow, and other kinds of wood, but moſt commonly of fir. Some take ſhoots of the pine-tree a year old, or common fir twigs of the ſame age, ſcrape off the bark, and reduce them to the ſize of a ſmall ſtraw; they then rub over theſe rods with wax or tallow, till they are covered with a thin coating of either of theſe ſubſtances; after which they roll them on a ſmooth table in a very fine carded cotton, drawn out to about the length of the rod or candle-mould. After this preparation the wick will have acquired the ſize of the barrel of a ſmall quill; and the more accurately the ſize of the wick is adapted to that of the candle-mould, ſo much the clearer and longer will the candle burn. Theſe wicks are then placed very exactly in the middle of the mould, and retained in that poſition; and good freſh tallow, previouſly melted with a little water, is then poured round them; but old and rancid tallow will not run if the wicks be properly made. Theſe candles not only burn longer than the common ones, but they do not flare, and they are leſs prejudicial to the eyes of thoſe who are accuſtomed to read or write at night. They muſt be ſnuffed with a pair of ſharp ſciſſars, and in doing this care muſt be taken not to damage or break the wick.

It has been ſuggeſted by Dr. Franklin, that the flame of two candles joined gives a much ſtronger light than both of them ſeparate. Probably the union of the two flames produces a greater degree of heat, by which the vapour is attenuated, and the particles of which light conſiſts more copiouſly emitted. Prieſtley's Hiſt. of Viſion, &c. p. 807. For a compariſon of the light of a candle with that of a lamp, ſee Lamp. For the method of eſtimating the intenſity of candle-light, &c. ſee Light and Photometer.

Dr. Ingenhouſz has deſcribed in the Philoſophical Tranſactions (vol. 68.) a method of lighting a candle by a ſmall electrical ſpark. For this purpoſe he uſes a ſmall phial, having 8 or 10 inches of metallic coating, or even leſs, charged with electricity; and the operation may be performed at any time of the night by a perſon, who has an electrical machine in his room. "When I have occaſion to light a candle," ſays he, "I charge a ſmall coated phial, whoſe knob is bent outwards, ſo as to hang a little over the body of the phial; then I wrap ſome looſe cotton over the extremity of a long braſs pin or a wire, ſo as to ſtick moderately faſt to its ſubſtance. I next roll this extremity of the pin wrapped up with cotton in ſome fine powder of reſin, which I always keep in readineſs upon the table for this purpoſe, either in a wide-mouthed phial or in a looſe paper; this being done, I apply the extremity of the pin or wire to the external coating of the charged phial, and bring as quickly as poſſible the other extremity wrapped round with cotton to the knob; the powder of reſin takes fire and communicates its flame to the cotton, and both together burn long enough to light a candle. As I do not want more than half a minute to light my candle in this way, I find it a readier method than kindling it by a flint and ſteel, or calling a ſervant. I have found, that powder of white or yellow reſin lights eaſier than that of brown. The "farina lycopodii" may be uſed for the ſame purpoſe; but it is not ſo good as the powder of reſin, becauſe it does not take fire quite ſo readily, requiring a ſtronger ſpark not to miſs; beſides, it is ſoon burnt away. By dipping the cotton in oil of turpentine, the ſame effect may be as readily obtained, if you take a jar ſomewhat greater in ſize. This oil will inflame ſo much the readier if you ſtrew a few fine particles of braſs upon it. The pin duſt is the beſt for this purpoſe; but as this oil is ſcattered about by the exploſion, and when kindled fills the room with much more ſmoke than the powder of reſin, I prefer the laſt."

For the method of lighting candles by phoſphoric tapers or matches, ſee Phosphorus.

Candle, a term ſometimes uſed in *Medicine* and *Surgery*. Thus, medicinal candles, *candelæ fumales*, are compoſitions of odoriferous, aromatic, and inflammable matters, as benzoin, ſtorax, olibanum, turpentine, and the like, mixed up with a third or more of the charcoal of willow or lime-tree, reduced to a proper conſiſtence with mucilage of tragacanth, and formed into maſſes in ſhape of candles. The *effluvia* and odours of theſe candles, when burnt, are ſuppoſed to be ſalutary to the breaſt, &c. For candles in ſurgery; ſee Bougie.

Candle, *corpſe*, *canwyll corph*, in Welſh, a name given to a light or flame, reſembling that of a candle, which, according to an opinion very commonly received in the dioceſe of St. David's in South Wales, proceeds from the houſe, and even ſometimes from the bed, where a ſick perſon lies a ſhort time before his death, and purſues its way to the church where the corpſe is to be interred, preciſely in the ſame track which the corpſe is afterwards to follow.

Candle, *ſale* or *auction by inch of*. See Inch *of Candle*. There is alſo a kind of excommunication by inch of candle; wherein the time a lighted candle continues burning is allowed the ſinner to come to repentance; but after which he remains excommunicated to all intents and purpoſes.

Candle-*berry tree*, in *Botany*, ſee Myrica *Cerifera*. For the wax of this tree, ſee Wax.

Candle *bombs*, denote ſmall glaſs bubbles, with a neck of ſlender bore about an inch long, through which a ſmall quantity of water is introduced, and the orifice is then cloſed up. When this ſtalk is applied to the wick of a burning candle, the flame ſoon rarefies the water into ſteam, the elaſticity of which breaks the glaſs with a loud exploſion.

Candle, *philoſophical*, or *candle of the chemiſts*, as it is ſometimes called, conſiſts of a bladder having its orifice furniſhed with a tube of metal ſome inches in length, and capable of being adapted to the neck of a bottle, containing a compoſition formed in the proportion of 3 ounces of oil or ſpirit of vitriol, and 12 ounces of common water, to which, when heated, is added an ounce or two of filings of iron. When the vapour or elaſtic air produced by the ſolution is diſcharged, apply the neck of the bottle to the orifice of the bladder, from which the air has been previouſly expelled by preſſure, and it will be filled with the elaſtic fluid produced by the diſſolution of the iron. When it is full, withdraw it, and apply to the orifice the flame of a torch, which will ſet fire to the vapour and cauſe it to burn ſlowly; and if the bladder be compreſſed, it will yield a fine flaming ſtream of a yellowiſh green colour.

Candles, *ruſh*, are made of the pith of a ſort of ruſhes, peeled or ſtripped of the ſkin, except on one ſide, and dipped in melted greaſe. Theſe are uſed among the poor in ſome parts of Great Britain.

Candle-*wood*, ſlips of pine about the thickneſs of the finger uſed in New England, and other colonies, to burn inſtead of candles, giving a very good light.

The French inhabitants of the iſland of Tortuga uſe ſlips of yellow ſantal wood for the ſame purpoſe, and under the ſame denomination of *bois de chandelle*, which yields a clear flame, though of a green colour. The nations of Otaheitee uſe, as a ſubſtitute for candles, the kernels of an oily nut annexed, one above another, to a ſkewer that paſſes through them; the nuts anſwer the purpoſe of tallow, and the ſkewer that of a wick.

CANDLEMAS, a feaſt of the church, held on the 2d of February, in memory of the Purification of the Bleſſed Virgin.

It takes its name either from the number of lighted candles uſed by the Romiſh church, in the proceſſions of this day; or becauſe, before maſs, the church conſecrated candles for the whole year. This ceremony was prohibited in England, by an order of the council in 1548.

Candlemas is alſo called, in ancient writers, *Hypapante*; and among the moderns, the *Purification*.

Some will have this feaſt to have been inſtituted by pope Gelaſius, in lieu of the heathen lupercalia; and that proceſſion was thereon made with lighted candles round the fields and grounds, by way of exorciſm. Hence Bede ſays, "It is happy for the church to have changed the luſtrations of the heathens, held in the month of February, around the fields, for the proceſſions with hallowed candles, in remembrance of that divine light wherewith Chriſt illuminated the world, whence he was ſtyled by Simeon, a *light to lighten the Gentiles*." Others aſcribe the origin of candlemas to pope Vigilius, in the year 536, and ſuppoſe it inſtituted for the feaſt of Proſerpine, held with burning tapers by the heathens in the beginning of February.

In Scotland, candlemas is one of the four terms of the year. See Term.

In England, this is no day in court, for the judges do not ſit; and it is the grand day in that term of all the inns of court, in which the judges anciently obſerved many ceremonies, and the ſocieties ſeemed to vie with each other in ſumptuous entertainments, accompanied with muſic and all kinds of diverſions.

Candlemas *Iſles*, in *Geography*, two iſlands in the South Pacific Ocean, diſcovered by captain Cook in 1775. S. lat. 57° 10'. W. long. 27° 13'.

Candlemas *Shoals* lie about 2° of latitude due N. of Port Praſlin (which ſee), and were diſcovered, named, and paſſed by Mendana, in 1569.

CANDLESTICK, a houſehold utenſil, contrived to hold one or more lighted candles. Larger and more ſtately candleſticks, contrived for holding a great number of candles, are called *branches*, and *girandoles*; and when made of glaſs, *luſtres*.

In the year 1800, Mr. Raybould, of London, obtained a patent for candleſticks on a new principle, which will admit and firmly hold candles of various ſizes. The candleſtick of his invention is a hollow pillar of metal as uſual; the candle is fixed into a ſocket compoſed of a broad circular ring, formed of two half cylinders cut down perpendicularly, and fixed in the ſame ſtand, ſo as to form a complete cylinder when joined together. Their approach to each other is regulated by a ſcrew, ſo that they may be preſſed upon a candle of any ſize, and will hold it firmly. The candle ſlides up and down the candleſtick by means of a ſmall knob which is fixed to the ſocket containing the candle, and projects on the outſide through a longitudinal ſlit in the candleſtick from the top to the bottom. The candle ſocket is kept up to any height by a ſpring which projects from its lower part, and preſſes on the outſide of the hollow pillar, which forms the ſtem of the candleſtick. *Fig*. 7, *Plate of Candle-making*, repreſents one of Mr. Echardt's patent candleſticks; it is calculated to ſet the candle at any height as it is conſumed: to accompliſh this the upper part A ſlides into that of B, and the part B ſlides up and down in that of C. In order that theſe ſlides may keep in the place they are ſet, the rim D, *fig*. 7, unſcrews, and is repreſented ſeparately in *fig*. 8. To the bottom of the rim is ſoldered a copper cylinder, which goes withinſide of the tube *c*; in three or four places on this cylinder an oblong piece of the metal F is cut out, except at the upper end; it is then bent inwards, to give it a ſufficient ſpring againſt the ſliders A, B, to ſteady it: this contrivance is the ſame as is uſed in ſliding teleſcope tubes. *Figs*. 9, 10, 11, and 12, repreſent different contrivances for making the nozle of the candleſtick fit different ſized candles; in *fig*. 9, the two leaves A, B, which compoſe the nozle, are ſo fixed to the part *c*, as to have a tendency to ſpring from each other; but they can be brought together to fit the candle, by ſliding the ring D upwards. In *fig*. 10, the two pieces of iron plate A, B, are incloſed in a common veſſel, and are riveted to it at *c*; they may be cloſed by the ſcrew D, and their own elaſticity opens them when the ſcrew is ſlackened. In *fig*. 11, the ſize of the nozle A is diminiſhed by three ſegments of a circle *a b*, and another not ſeen, which, when the rim B, on the outſide, is turned one way, they move into, and diminiſh the ſize of the nozle A; but when it is turned the other, they draw back fluſh with the inſide of the tube A. This is effected by the mechaniſm, repreſented in *fig*. 12, where *a*, *b*, *c*, are the ſegments moving on centres; on the inſide of the rim B, C, are three knobs *h*, *h*, *h*, which, when they are moved round one way, preſs on the projections *a*, *b*, *c*, on the long end of the ſegments, and move them into the cavity A; but when turned the other, they preſs the knobs on the ſhort end of the ſegments, and draw them back.

The *golden candleſtick* was the richeſt utenſil in the Jewiſh tabernacle. It was made of ſolid gold, and weighed a talent; and, according to Cumberland, the value of it, excluſive of the workmanſhip, was 5076 pounds. It contained ſeven lights, ſix branching out in three parts on each ſide of the upright ſtem, and one on the top of it. Each branch was adorned with cups, knobs, and flowers, alternate and equidiſtant; and on the top of each was fixed a lamp, in form of an almond, which might be put on or taken off occaſionally; and in theſe were put the oil and the wick, or the cotton, which was drawn in and out by tongs or ſnuffers; under them were ſnuff-diſhes for receiving the ſparks, or refuſe of the oil that fell from the lamps. This candleſtick was placed in the antichamber of the ſanctuary, on the ſouth ſide, and ſerved to illuminate the altar of perfume, and the tabernacle of the ſhew-bread: and it was the buſineſs of the prieſt to light the lamps every evening, at the time of incenſe, and to extinguiſh them at the ſame time every morning. In Solomon's temple there were ten golden candleſticks of the ſame form with that deſcribed by Moſes; five on the north, and five on the ſouth ſide of the holy place. But after the Babyloniſh captivity, the golden candleſtick was placed in the temple, as it had been before in the tabernacle of Moſes; and when the Temple was deſtroyed, it was depoſited in the Temple of Peace, built by Veſpaſian; and the repreſentation of it ſtill remains on the triumphal arch, at the foot of mount Palatine, on which Veſpaſian's triumph is delineated.

CANDLESTICK, *water*, a kind of jet or fountain raiſed on a foot which ſupports a little baſon reſembling the diſk of a candleſtick, down which the water falls into another larger baſon.

CANDO, CUNDI, or CONDI, in *Commerce*, a long meaſure uſed in ſeveral parts of the Eaſt Indies, particularly at Goa, the capital of the Portugueſe ſettlements there.

Silk and woollen ſtuffs are meaſured by the *varre*, and linen by the *cando*. The *cando* uſed in Pegu is equal to the Venetian ell.

CANDOLLEA, in *Botany*, a genus formed by Mirbel for ſome ſpecies ſeparated from *acroſtickum*.

Gen. Ch. Fructification diſpoſed regularly in dots: involucres lodged in ſmall cavities. It contains A. *heterophillum*, *lanceolatum*, and *polypodioides* of Linnæus, and A. *longifolium* of Burman, all natives of the Eaſt Indies. See ACROSTICHUM.

CANDUARRE *Corle*, in *Geography*, a diſtrict or county in the ſouth-eaſtern part of the iſland of Ceylon. See CEYLON.

CANDURA, a cape of the iſland of Rhodes, which forms with cape Tranquillo, the moſt conſiderable and the moſt ſouthern promontory of the iſland, a large open bay. A river alſo, bearing the ſame name, diſcharges itſelf into the ſea, in the vicinity of this cape, after watering the interior parts of the iſland.

CANDY, a very conſiderable province in the iſland of Ceylon, ſituate in the centre of the iſland, and formerly honoured with the royal reſidence. The king ſtill holds his court there; and though all the other provinces have been more or leſs encroached upon, no part of Candia has ever been reduced to permanent ſubjection under a foreign power. The European dominions, however, which lie towards the coaſt, completely encircle the territories of the king of Candy, that occupy the greater part of the interior of the iſland. But ſince the Candians have been driven by their invaders into the mountains of the interior, it has been their policy carefully to prevent any European from ſeeing thoſe objects which might tempt the avarice of his countrymen, or from obſerving the approaches by which an army could penetrate their mountains. If an European by any accident was carried into their territories, they took every precaution to prevent him from eſcaping; and the guards ſtationed every where at the approaches, as well as the wide and pathleſs woods which ſeparate the interior from the coaſt, rendered ſuch an attempt almoſt completely deſperate. The dominions of the native prince are cut off on all ſides from thoſe occupied by the Europeans, by almoſt impenetrable woods and mountains. The paſſes which lead through theſe to the coaſts are extremely ſteep and difficult, and ſcarcely known even to the natives themſelves. Beyond the woods and mountains the country preſents a ſcene widely differing in ſoil, climate, and appearance from that which lies within 10 or 20 miles from the ſea-coaſt; and it ſeems to have advanced but a few ſteps beyond the firſt ſtate of improvement, when compared with the highly cultivated fields, not far diſtant, which ſurround Columbo. The country gradually riſes toward the centre of the iſland, and the woods and mountains that ſeparate its ſeveral parts become more ſteep and impervious. In theſe faſtneſſes the native prince ſtill preſerves thoſe remains of territory and power, which have been left him by ſucceſſive invaders. His dominions are of courſe much reduced in ſize; for beſide the whole of the ſea-coaſts, which were of any value, the Dutch, in their various attacks during the laſt century, have contrived to get into their power every tract from which they could derive either emolument or ſecurity. Thoſe provinces which he ſtill retains are Noureculva and Hotcourly, towards the north and north-weſt; while Matuly, comprehending the diſtricts of Bintana, Velas, and Panoa, with a few others, occupies thoſe parts that lie more to the eaſtward. To the ſouth-eaſt lies Ouvah, a province of ſome note, which gives to the king one of his titles. The weſtern parts are chiefly included in the provinces of Cotemal and Hotteracorley. Theſe different provinces are ſubdivided into "corles," or diſtricts, and entirely belong to the native prince. In the higheſt and moſt centrical part of the native king's dominions lie the "corles," or counties of Oudanour and Tatanour, in which are ſituated the two principal cities. Theſe countries take the pre-eminence of the reſt, and are both better cultivated, and more populous than any of the other diſtricts; and they are diſtinguiſhed by the general name of "Condé Udda;" "condé," or "candé," in the native language ſignifying a mountain, and "udda" the greateſt or higheſt. This province of Condé Udda is even more inacceſſible than the others, and forms a kind of ſeparate kingdom of itſelf. On every ſide it is ſurrounded by lofty mountains covered with wood, and the paths that lead to it are little more than the tracts of wild beaſts. Guards are ſtationed all round it to prevent both entrance and eſcape. The chief cities are Candy, Digliggy Neur, and Nilemby Neur, which ſee. The ruins of other towns, apparently larger and better built, prove that the kingdom of the Candians was once in a more flouriſhing condition, and gradually tending, by the natural courſe of things, to civilization and opulence, when the invaſion of the Europeans deprived them of all thoſe means by which they could have acceſs to foreign nations, and an opportunity of importing either arts or manners into their own. In the northern part of the kingdom lies the province of Noure Calava, where may ſtill be diſcovered the ruins of the once famous and ſplendid city of Anurodgburro; ſtanding almoſt at the northern extremity of the Candian dominions, and bordering on the province of Jafnapatam. In former ages this was the reſidence of the kings of Ceylon, and has for a long time been the place of their burial. Tradition reports, that they reigned in regular ſucceſſion for 90 generations of the ſame family, from the time of the flood, and that they lived to a great age, like the ancient patriarchs. After their death they are ſuppoſed to have been carried up to heaven, and to have been ſince employed as tutelary deities to the inhabitants of the iſland. They were revered as deities, and all buried in a large temple, or tomb, near their ancient city of Anurodgburro, the remaining veſtiges of which indicate an uncommonly excellent architecture for the age in which it was erected. In the vicinity of this town ſtood formerly the ſtately temples and pagodas of the Ceyloneſe worſhip, as appears by the maſſy pillars and hewn ſtones which ſtill remain. The Portugueſe, when they became maſters of the town, ſacrilegiouſly deſtroyed its religious edifices, and tranſported the choiceſt materials to fortify Columbo and the other towns which they erected on the ſea-coaſts;—an act which the Ceyloneſe ſtill record with horror. The whole of the king's country, the plains around Anurodgburro excepted, preſent a conſtant interchange of ſteep mountains and low vallies. The exceſſive thickneſs of the woods, that cover the greateſt part of the country, occaſions heavy fogs and unwholeſome damps. The vallies are generally marſhy, and abounding with ſprings, which excellently adapt them to the cultivation of rice and the rearing of cattle. The inſalubrity of the climate, after the rainy ſeaſon, counteracts theſe advantages. The principal difference between the climate of the interior and that of the coaſts is occaſioned by the ſtagnation of the atmoſphere in the former. The depth of the vallies and the thickneſs of the woods concur in preventing the free circulation of the air; ſo that the night is conſtantly attended with very cold damps, which are ſucceeded by days equally noxious on account of their hot and ſultry vapours. Hence it happens, that an European on coming to the interior is very ſubject to the hill or jungle fever; a diſeaſe reſembling our ague and intermittent fever, accompanied with a violent dyſentery, which never leaves the perſon attacked till he removes to the ſea-coaſt, where the climate is more cool and refreſhing in the day, and more free from the cold and damps of the night. The country of Candy can never derive any improvement from internal navigation; as the ſeveral large rivers that interſect it are rendered, during the rainy ſeaſon, ſo rapid and impetuous by the torrents which fall into them from the ſurrounding hills, that no boat can venture upon them, while in the oppoſite they are almoſt completely dried up. Its largeſt rivers are the *Malivagonga* and *Mulivaddy*, which ſee. The rainy ſeaſon varies in different parts of the interior. The S.W. quarter is ſubject to the influence of the weſtern monſoons, while the N.E. is but ſlightly touched by thoſe from the oppoſite quarter. The high range of mountains that croſſes the country of Candy divides the iſland into two different climates; ſo that there has been a continued drought on one ſide of them for years, while it has rained on the other without intermiſſion. The eaſtern parts are leſs ſubject to the influence of the monſoons than thoſe to the weſt, and conſequently much leſs deluged with rains. Among the mountains of the interior, the ſeaſons do not exactly correſpond to either of the monſoons; and among them it rains inceſſantly in March and April, at which period it is dry in the low lands.

The diſpoſition and character of the Candians derive their caſt from their ſituation. Although they are ſubject to complete deſpotiſm, they are proud of being free from a foreign yoke, and of being ſlaves only to a maſter of their own race. They are in their air and aſpect grave and haughty, and regard with contempt the Cingleſe in our ſervice, as a mean deſpicable race, who barter their natural rights for peace and protection. Nevertheleſs, they are more courteous and polite, and at the ſame time more crafty and treacherous than their countrymen of the low-lands. They are alſo more athletic, and being accuſtomed from their infancy to bear arms, and to watch the different poſts where danger is apprehended, they acquire a military air, which diſtinguiſhes them from the Cingleſe. Their houſes are alſo neater and better built. The dreſs of the higher order of the Candians conſiſts of ſeveral folds of cotton cloth, or calico, drawn cloſe round their waiſts; while another piece, after being wrapped round the body, is tucked up at the back by one end, and by the other drawn together between the legs, or hanging down ſtraight to the ancles: their arms, ſhoulders, and cheſt are bare. On their heads they wear a ſort of turban, broad and flat at the top, narrow towards the lower part, and ſtiffened with "conjee," a ſpecies of ſtarch made of rice. Over their ſhoulders, or round their waiſts they wear a belt, to which a dagger or ſhort hanger is ſuſpended. Before them they wear a purſe, which holds betel-leaf, areka-nuts, and tobacco; and they are commonly attended by a boy, with an ivory or tortoiſe-ſhell box filled with theſe articles. They conſtantly uſe an umbrella of talipot-leaf when they walk abroad in the day. They all wear rings on their fingers; but are prohibited by royal authority from uſing them in their ears. The chief diſtinction, with regard to dreſs, between the higher order of the Candians and the Cingleſe, conſiſts in the form of the cap, and the immenſe quantity of cloth worn round the waiſt of the former. The dreſs of the lower orders among both is in every reſpect the ſame, the diſtinction of the cap excepted. The Candian men in general are better dreſſed than the Cingleſe, and alſo fairer in their complexion. The women are not eaſy of acceſs to the Europeans; but it is ſaid, that there is no material difference in the manners, appearance, or dreſs of the Candian and Cingleſe females.

The Candians are diſtributed into different claſſes, ſcrupulous of their reſpective precedence. The firſt claſs comprehends the nobles, who never contaminate their blood by intermarriage with perſons of an inferior rank. This claſs is known by the name of "Hondrews." The next rank includes artiſts, as painters, ſmiths, carpenters, and goldſmiths. Their dreſs is the ſame with that of the Hondrews, but they are not permitted to eat with the nobles, or to mix in their ſociety. Thoſe who are employed in the lower occupations, as they are deemed, of barbers, potters, waſhers, weavers, &c. form a third caſt, with which the common ſoldier ranks. The fourth caſt includes the peaſantry and labourers of all deſcriptions, who either cultivate the land for themſelves, or are forced to work for others. All theſe four caſts continue unmingled; the ſon purſuing the profeſſion of his father from generation to generation. Beſides theſe caſts, there is in Candia, as well as in other parts of India, another wretched claſs, conſiſting of ſuch, who by any crime or neglect of ſuperſtitious rites have, according to the decree of the prieſts, forfeited their caſt, and are condemned to infamy, pertaining to themſelves, and entailed on their deſcendants through all generations. None of any other caſt will intermarry with them; they are not allowed to exerciſe any trade or profeſſion, nor to hold intercourſe but with ſuch as themſelves; and if they accidentally touch any thing, it is reckoned polluted and accurſed. Not allowed to work, they are reduced to the neceſſity of begging for their ſubſiſtence. Theſe unhappy people are obliged to pay the loweſt of the Candians as much reverence as eaſtern ſervility ordains the latter to pay to their ſovereign.

The government of Candy is an abſolute deſpotiſm, and reſiſtance to the will of the king is attended with certain and immediate deſtruction. Nevertheleſs, the Candians hold in veneration fundamental laws of remote antiquity, the violation of which renders the ſovereign amenable to the juſtice of his country as well as the meaneſt ſubject. By theſe fundamental laws the monarchy is elective, and the people may ſet aſide the next branch of the royal family, and elect the more diſtant, or even a ſtranger; though the throne has been in general, for many ages, poſſeſſed by the ancient Candian royal family, which is now very nearly extinct. The king of Candy yields to no eaſtern prince in the number and extravagance of his titles, which it is needleſs to recount. They claim, however, from his ſubjects correſponding reverence. No one dares approach him without proſtrating himſelf three times before the throne, and at each act of proſtration reciting his titles. Perſons of the higheſt rank are prohibited from coughing or ſpitting in his preſence, and every one maintains before him inviolable ſilence. His progreſs, however, is always attended by a number of performers on various inſtruments, ſuch as tom-toms, or drums of various ſizes, ſhrill and ſqualling clarionets, pipes, flageolets, a ſort of bag-pipes, and pieces of braſs and iron jingled by way of triangles. Among other attendants of the monarch are people furniſhed with long whips, made of hemp, coya, graſs, or hair, with a thong or laſh 8 or 12 feet in length, without any handle; and whoſe buſineſs it is to run before the proceſſion with ſtrange geſtures, in order to clear the way, and to announce his majeſty's approach. As the government is deſpotic, all ſorts of promotion depend on the king's pleaſure; nevertheleſs, reſpect is uniformly manifeſted to the inſtitution of caſts, and officers of a certain rank muſt always be choſen out of a certain claſs. The king's regular troops, or ſtanding army, are always near his perſon, and do duty in the interior; while the defence of the frontiers is entruſted to the adjoining inhabitants, who form a ſort of militia, and watch over the entrances into the country. The higheſt officers of the ſtate are the "Adigars," or prime miniſters, two in number, who ſhare the whole power of the court. Theſe are uſually ſelected from oppoſite factions, and of different diſpoſitions, to prevent an union which might overwhelm the royal power. The adigars are the ſupreme judges of the realm; before them all cauſes are brought, and they pronounce final judgment; though from their ſentence an appeal, ſeldom of any avail, lies to the king himſelf. The diſtinguiſhing badge of the adigars conſiſts of a certain number of officers, who compoſe their train, and who carry a ſort of ſtaves, and a ſeal of hard clay, indicating the king's commiſſion, and never failing to command obedience to any mandate that is iſſued. The embaſſies to the European government at Columbo are entruſted to theſe prime miniſters; and they are alſo charged with the reception of our ambaſſadors. Next in rank to the adigars are the "Diſſauvas," who are the governors of the "corles," or diſtricts, and alſo the principal military commanders: they attend the king's perſon, collect the revenues, and maintain order and diſcipline. But though they poſſeſs great authority, as well as the other officers of ſtate, none of them are allowed to puniſh capitally without the cognizance of the king, whoſe excluſive prerogative it is to pronounce ſentence of death. The diſſauvas, whilſt they retain their office, are allowed by the king a certain portion of land for their ſervices; but under pretence of collecting contributions for their royal maſter, they are chargeable with grievous oppreſſion. Subordinate to theſe are inferior officers reſident in the ſeveral diſtricts in which they are appointed, as their ſuperiors generally reſide at court and attend the perſon of the king. To theſe again there is another inferior rank of officers, who fulfil the duties of conſtables and police officers. The whole plan of government forms a regular ſyſtem of oppreſſion, which is ſeverely felt by the lower orders of the people, whoſe property is wholly at the mercy of the rapacious officers of the court.

The principal revenues of the king ariſe from preſents or contributions brought him by the people, or rather irregularly enforced by his officers, two or three times a year. Theſe contributions conſiſt of money, precious ſtones, ivory, cloth, corn, fruit, honey, wax, arms, and other articles of their own manufacture, as ſpears, arrows, pikes, targets, talipot-leaves, &c. The oppreſſion principally experienced by the lower claſſes of the people is alſo extended to perſons of ſuperior rank. On certain feſtivals obſerved in great ſtate, all the "Mahondrews" and principal people are required to attend, and none muſt approach the royal preſence empty-handed. After depoſiting their preſents at the palace-gate they are admitted into the preſence of the king, and received according to the value of their offering. Beſides theſe ſtated modes of extortion, there are others no leſs oppreſſive. Any perſon who is known to poſſeſs any articles of value is required to impart a portion to the royal treaſury; and artiſts are frequently employed by the king to manufacture for him arms and different articles in ſilver and gold, altogether at their own expence. All the Candians are obliged to take arms without diſtinction at the command of the ſovereign. His regular troops, as they are called, may conſiſt of about 20,000 men. Like other deſpots who are afraid to truſt their own ſubjects, the king always keeps about his perſon a body of Malabars, Malays, and others who are not his own natural ſubjects. In theſe he repoſes his chief confidence, and he employs them as his conſtant body-guard. Beſide this corps of foreign guards, who do perpetual duty at the royal palace, about 8000 of his regular troops and a number of the nobles are quartered in the neighbourhood, ready to be aſſembled at a moment's notice. The reſt of the military force lies ſcattered through the country. Their pay and ſubſiſtence conſiſt of a ſmall allowance of rice and ſalt, a piece of cloth annually given for their dreſs, and an exemption from taxes and all other ſervices, and a ſmall piece of ground which they cultivate for their maintenance. The uſual military puniſhment is compulſion to level a piece of hill, or clear the channel of a river. For more trivial offences the ſoldiers are curtailed of their pay and allowances. Diſtruſt and jealouſy, the conſtant attendants of arbitrary power, pervade the whole military ſyſtem. Officers are encouraged by the king to act as ſpies againſt each other, and they are forbidden to correſpond, or even to ſee each other, except at times when public exigency requires their being aſſembled. They are chiefly prevented from forming any intercourſe or combination with Europeans; and for this purpoſe a continued chain of poſts and watches is eſtabliſhed around all the outſkirts of his dominions. This ſyſtem of vigilance is ſo ſtrictly obſerved, that no one is permitted to paſs from one diſtrict to another without examination and a paſſport, bearing different impreſſions according to the profeſſion of the bearer. The natives univerſally travel on foot; riding on horſeback being a royal privilege, ſeldom uſed by the monarch himſelf. No horſes indeed are kept in the interior except thoſe belonging to his majeſty: nor are any horſes reared in the interior. The Candians have no fixed and eſtabliſhed laws; though they boaſt of an ancient code, which remains in the hands of the king, who is its ſole interpreter. His authority ſuperſedes every other deciſion. The trials of the Candians are ſummary; and their puniſhments, unleſs the king interpoſes, immediate. Their capital puniſhments are always attended with ſome circumſtances of aggravation; ſuch as having the criminal daſhed to pieces by elephants, pounding him in a large mortar, or impaling him on a ſtake. Impriſonment is a ſpecies of puniſhment never inflicted on a Candian; and every ſpecies of confinement conveys ideas peculiarly horrible to their imagination. The great ſafe-guard of juſtice among the Candians is the natural mildneſs and honeſty of their diſpoſitions, in which they excel all other Indians. The Candians, precluded from intercourſe with foreign countries, and proud of immemorial independence, might be ſuppoſed to enjoy amidſt their native mountains and woods, a life of tranquillity and happineſs, not to be found among thoſe buſy nations, that are inflamed by luxury and agitated with the thirſt of gain. But this is far from being the caſe. The oppreſſion of their governors, the conſtant dread of Europeans, and the ſuperſtitious fears ariſing from the nature of their climate, by which they are continually haunted, deprive this iſolated people of all the enjoyments which ſeem congenial to their ſituation. Much of the gloom that overhangs the minds of the Candians originated with the oppreſſive exactions and deſtructive inroads of the Dutch. It is to be hoped, ſays Captain Percival, that our countrymen, by a generous and well regulated policy, will ſpeedily diminiſh their ſources of unhappineſs.

Percival's Account of the Iſland of Ceylon, 4to. 1805. See CEYLON.

CANDY, the capital of the king of Candy's dominions and the royal reſidence, is ſituated in the diſtrict of Tatanour, in the midſt of lofty and ſteep hills covered with thick jungle. The narrow and difficult paſſes, by which it is approached, are interſected with thick hedges of thorn; and hedges of the ſame ſort are drawn round the hills in the vicinity of Candy, like lines of circumvallation. The only paſſage through theſe is by gates of the ſame materials, called by the natives "Caravetties," and ſo contrived as to be drawn up and let down by ropes. When the Candians are obliged to retreat within theſe barriers, they cut the ropes, and then it is impoſſible to force a paſſage except by burning down the gates, which, from their green ſtate, and the conſtant annoyance of the enemy, would prove an enterpriſe of ſome time and difficulty. Theſe hedge-rows form the chief fortifications of Candy. The river Malivagonga alſo nearly ſurrounds the hill on which it ſtands: the river is here broad, rocky, and rapid; a very ſtrict guard is kept on it, and every one who paſſes or repaſſes is cloſely watched and examined. Although the caravetty neareſt Candy has a rampart or breaſt-work, on which ſome of their artillery is occaſionally mounted, it could make but a feeble reſiſtance to the approach of a regular army; ſo that Candy is indebted for its principal fortifications to nature. The city itſelf is a mean and miſerable place, ſurrounded by a mud wall of no ſtrength. Our chief knowledge of this city is derived from the embaſſy of general Macdowal, deputed to the king of Candy by governor North, in the year 1800, of which captain Percival has given a journal, in an appendix to his account of Ceylon: but the information thus obtained muſt neceſſarily be imperfect; as the ambaſſador and his ſuite were admitted only by torch-light, and always retired before break of day. From what they could obſerve the city conſiſts of a long ſtraggling ſtreet built on the declivity of a hill, about two miles long, with leſſer ſtreets branching off on both ſides: the houſes were mean and low, chiefly of mud, but their foundations were raiſed about 5 feet above the level of the ſtreet, ſo that they appeared lofty to paſſengers. The reaſon of this mode of conſtruction is to enable the king to hold his aſſemblies of the people, and to have his elephant or buffalo fights in the ſtreet without interfering with the houſes. Some of the houſes at the upper end of the ſtreet, belonging to the principal inhabitants, are tiled and white-waſhed. When the king paſſes along the ſtreet, none of the inhabitants are allowed to appear before their houſes or in the paths on a level with them, as this would be attended with the heinous indecorum of placing a ſubject higher than the prince deſcended of the ſun. At the upper end of this ſtreet ſtands the palace, built of a kind of cheenan or cement perfectly white, and containing a great number of rooms, the walls of which are painted in a grotesque manner, and covered with inſcriptions: in one room is a gigantic figure of braſs of Buddou in a ſitting poſture, with two ſmaller ones at his feet. The palace is ſurrounded with high ſtone walls, conſiſting of two ſquares, one within the other. In the inner of theſe, to which there is acceſs by a large arched gateway, are the royal apartments, where the court is held, and audiences are given. The hall of audience, or ſtate-room, is a long viranda, with alternate arches and pillars along its ſides, ſomewhat reſembling the aiſle of a church. At the farther end of this hall is placed a kind of platform or throne, covered with a carpet and ſurrounded with ſteps, where the king ſits in ſtate. His feet, and the lower part of his body are concealed from view by a ſmall partition in front. On occaſion of general Macdowal's reception, the courtiers were ſeen below the arches on each ſide of the hall, ſome proſtrate, others ſitting in ſilence and croſs-legged. The king was dreſſed in a robe of fine muſlin, embroidered with gold, drawn cloſe in ſeveral folds round the waiſt, and flowing from thence down like a lady's gown. His arms were bare from the elbows downwards. On his fingers were many broad rings ſet with precious ſtones of different ſorts, and a number of gold-chains were ſuſpended round his neck over a ſtiff frilled piece of muſlin reſembling Queen Elizabeth's ruff. His head was covered with a turban of muſlin ſpangled with gold, and ſurmounted by a crown of gold, by which he is diſtinguiſhed from all the other Aſiatic princes. Round his waiſt was a rich ſaſh, from which was ſuſpended a ſhort curved dagger or ſabre, with the handle richly ornamented, and the ſcabbard of gold fillagree-work. During the conference, which laſted three hours, roſe-water was frequently ſprinkled round from curiouſly wrought veſſels of gold; and perfumes were handed about on ſalvers of gold and ſilver fillagree-work. To one propoſal made on this occaſion, viz. that leave might be given to make a road, and to open a communication from Trincomalee to Columbo through the territories of the king a little north of Candy, he peremptorily refuſed to accede; but he expreſſed his decided averſion from any intercourſe or connexion exiſting between his ſubjects and the Europeans; profeſſing at the ſame time a deſire to live on amicable terms with the Britiſh, whoſe power he acknowledged to be far ſuperior to that of the Dutch. On January 31ſt, 1803, general Macdowal began his march with a conſiderable force into the Candian territory, and on the 20th of February, after encountering many difficulties, arrived at Candy. The king and his chief adigar precipitately withdrew, after having ſet fire to the palace and the temples. The Britiſh troops ſoon extinguiſhed the fire, and took poſſeſſion of the city. Although the Candians ſoon afterwards appeared in conſiderable force, they were quickly diſperſed after a dreadful ſlaughter. Before the Britiſh general left Candy, he adopted various meaſures to ſecure his new conqueſts. After ſome time, viz. in June, 1803, when it was thought tranquillity was eſtabliſhed, and in the midſt of a truce, Candy was attacked by the natives under the command of the firſt adigar; and the commanding officer, whoſe troops were become unfit for duty by the ſickneſs that prevailed among them, was under a neceſſity of capitulating, and of evacuating the fort, under a ſolemn ſtipulation that the garriſon ſhould be allowed to proceed, with arms and ammunition, and without moleſtation to Trincomalee, and that the ſick ſhould alſo be taken care of. In defiance of this agreement, after the commanding officer left the fort, all the Engliſh ſoldiers who accompanied him were treacherouſly murdered. Shortly after this maſſacre, the king of Candy, finding that the Britiſh force on the iſland was weak, determined to attack our forts on the coaſt; but all his efforts were ineffectual; and the Britiſh ſettlements were ſoon reſtored to ſecurity. Candy, or Kandi, lies in the centre of the country, 80 miles diſtant from Columbo, and about 160 miles from Trincomalee. N. lat. 7° 18′. E. long. 80° 46′.

CANDY, in ſpeaking of *Sugar*, denotes a preparation of that ſubſtance, made by melting, and cryſtallizing it ſix or ſeven times over, to render it hard and tranſparent. See SUGAR.

CANDY-*tuft*, in *Botany*. See IBERIS.

CANDYBA, in *Ancient Geography*, one of the moſt conſiderable towns of Aſia Minor in Lycia, which, according to Steph. Byz. derived its name from Candybus, ſon of Deucalion.

CANDYING, denotes an operation in *Pharmacy*, as well as *Confectionary*: thoſe ſimples which are preſerved in ſubſtance by boiling in ſugar being ſaid to be *candied:* though the performance of it is now transferred to the confectioner from the apothecary, to whom it originally belonged.

CANDYS, in *Ancient Geography*, a town of Aſia; in Media. Ptolemy.

CANE, in *Botany*. See Arundo *Bambos*, or *Bamboo.*

Cane, *ſugar*. See Saccharum.

Cane, in *Commerce*, the ſame with reed, called among botaniſts arundo, which ſee.

Canes make a conſiderable article in commerce. There are imported two ſorts, viz. *walking* and *rattan canes*.

Canes, *walking*, are ſaid by Bradley to be joints of the roots of a ſort of reed, called *canna Indica.* This plant ſhoots in joints of about three or four feet long, near the ſurface of the ground, and at every knot produces great numbers of fibres, by which it receives its nouriſhment. The joints are made ſtraight by the fire, which occaſions thoſe ſhades or clouds frequently ſeen in them. Bradley thinks the cane-tree might be propagated here by planting ſome of the roots with their knots in artificial bogs, &c.

Canes may be ſtained like tortoiſe-ſhell, by a mixture of aqua fortis and oil of vitriol laid on them at ſeveral times over live coals, to cauſe it to penetrate the deeper, and afterwards giving them a gloſs with a little ſoft wax, and a dry cloth. Boyle.

Canes, *rattan*, are a ſmaller ſort brought from China, Japan, and Sumatra, very tough; which being ſplit, are uſed for making of cane chairs. They are the produce of a reed called *rattang Malabarica minor*, or leſſer rattan. The ſpecific name is rotang, whence rattan, and in the Malayan language ſignifies a ſtaff or walking ſtick. Theſe when dry, being ſtruck againſt each other, will give fire, and are uſed accordingly in ſome places in lieu of flint and ſteel. Being twiſted together they make cordage of them. The Chineſe and Japaneſe veſſels are ſaid to have their cables made of them, which are leſs liable to rot in the water than hemp. Phil. Tranſ. N° 244, p. 326, and N° 267, p. 717. See Calamus.

The canes, or canas, in the juriſdiction of Guayaquil in South America, are remarkable for both their length and thickneſs, and the water contained in their tubes. Their uſual length is between 6 and 8 toiſes; and the largeſt do not exceed 6 inches in diameter. The wood or ſide of the tube is about 6 lines in diameter; ſo that when the cane is opened, it forms a board near $1\frac{1}{2}$ foot in breadth; and, therefore, it will not appear ſtrange that houſes ſhould be conſtructed of ſuch materials. From the time of their firſt appearance, till they attain their full perfection, when they are either cut down, or of themſelves begin to dry, moſt of their tubes contain a quantity of water, with this remarkable difference, that at full moon they are entirely, or very nearly, full, and with the decreaſe of the moon, the water ebbs, till at the conjunction little or none is to be found. During its decreaſe, the water appears turbid; but about the time of full moon, it is clear as cryſtal. The water is found to be an excellent preſervative againſt the ill conſequence of any bruiſes; at leaſt it is drunk by all who come from the mountains, where ſuch accidents are unavoidable. The canes, being cut, are left to dry, or, as they ſay, to be cured; whence they acquire ſuch a degree of ſtrength, that they ſerve for rafters, beams, floorings, or even maſts for balzas. Ships which load with cacoa are alſo cieled with them, to preſerve the timber from the great heat of that fruit. They are alſo uſed as poles for litters, and in a variety of other ways. Juan and De Ulloa's voyage to South America, by Adams, vol. i. p. 209.

Cane, *fiſhing-rod*. See Reed.

Cane, *Indian*. See Canna.

Cane-*apple*, in *Natural Hiſtory*, a name given by the common people of Ireland to the *arbutus*, or ſtrawberry-tree. See Arbutus.

Cane, Canna, a long meaſure, frequent in Italy, Spain, and the ſouth parts of France; of greater or leſs length, according to the places where it is uſed. It is called by the Latins *calamus*, and in ſcripture a *reed*.

At Naples, the canna is equal to ſeven feet $3\frac{1}{2}$ inches, Engliſh meaſure; the canna of Thoulouſe, and the Upper Languedoc, is equal to the *vara* of Arragon, and contains five feet $8\frac{3}{4}$ inches; at Montpellier, in Provence, Dauphiné, and the Lower Languedoc, to ſix Engliſh feet $5\frac{1}{2}$ inches.

Cane, in *Ancient Geography*, a port-town of Arabia Felix, attributed by Ptolemy to the Adramites, who formed a claſs of the Sabæans.—Alſo, a promontory near this town, on the Red Sea.—Alſo, a promontory of Aſia minor, near the Caicus.

Cane, in *Geography*, a river of Hindooſtan, which runs into the Jumnah, 20 miles S.E. of Corah.

Cane, in *Rural Economy*, a term ſometimes uſed to ſignify a hollow place where water ſtands. It alſo implies a wood of alder, or other aquatic trees, in a moiſt boggy ſituation.

CANEA, in *Geography*, a maritime town of the iſland of Candia, or Crete, ſituate at the eaſtern extremity of a large bay, on the north ſide of the iſland, and ſuppoſed to have been built on the ſite of Cydonia, a flouriſhing city of ancient Crete, although no veſtige of ancient edifices be now perceived. Canea, after reſiſting the efforts of the Ottoman army conſiſting of 60,000 men for 50 days, during which ſiege the Turks are ſaid to have loſt 25,000, was compelled to capitulate in the year 1645. Although it is much leſs extenſive than Candia, the capital, it is the moſt populous and the moſt trading town of the whole iſland. In this place are reckoned upwards of 4000 Turks, 2 or 3 thouſand Greeks, 150 Jews, 4 French houſes, and ſome Italian houſes, which latter are under the protection of the emperor of Germany, or the republic of Raguſa. The form of its buildings reſembles that of the houſes of the Eaſt: in lieu of roofs, inclined and forming a ridge, they have a flat covering without tiles or ſlates, and conſtituting a terrace: moſt of them have only one ſtory. The ſtreets are laid out by the line; ſome of them are tolerably wide; in the public ſquares are fountains that flow with an abundant ſtream. The town is ſurrounded by a ſtrong wall and a wide ditch. It has but one gate on the land ſide. The harbour is defended by batteries in a good condition. To the left, on entering, is ſeen a jetty parallel to the coaſt, behind which a conſiderable number of veſſels might anchor if the bottom were cleanſed. The largeſt are obliged to remain near the entrance of the harbour, expoſed to the waves of a rough ſea when the northerly winds blow with violence. If during theſe northerly gales, they happen to have run into it, it is not poſſible for them to get out; but they are obliged to ſteer for the very narrow mouth of the harbour, where the waves riſe in heaps and frequently ſo high as to clear the mole, and to ſpread and break in the baſon. This baſon, through the negligence of the Turks, is choked up: it can ſcarcely admit veſſels of 200 tons burden: the arſenal and fine docks which the Venetians had conſtructed oppoſite to the jetty are falling into ruins and unfit for uſe. In the environs of Canea, there are ſome beautiful plains that are tolerably fertile and almoſt entirely cultivated; and they preſent to view gardens of orange-trees, foreſts of olive-trees, a few ſcattered vineyards, and fields appropriate to the culture of wheat, barley, cotton, ſeſamum, maize, melons, and different legumes. On the weſt of the town, beyond the little deſert iſland of *San Theodoro*, on which the Venetians had erected a battery for preventing a deſcent on the beach, is ſituate Platania, an extenſive, ſolitary, and rural walk, where grow ſpontaneouſly plane trees that excite aſtoniſhment by their ſize and number. Each of theſe ſupports one or two vine-plants, which embrace the whole compaſs of the tree, and furniſh in abundance, without care or culture, grapes with large ſtones of an excellent quality. A ſmall river alſo traverſes and waters this agreeable foreſt. The banks of the rivulets in the vicinity of Canea are commonly covered with oleanders and myrtles; and a great variety of trees bearing fruit, and of plants perfuming the air with their flowers, render the environs of this town peculiarly pleaſant and inviting.. The famous fraxinella or dittany of Crete, celebrated by the ancients, profuſely clothes the rocks in the neighbourhood. It is collected by the peaſants and formed into ſmall bundles, and brought to the markets of Canea and other towns, where it is much eſteemed for its permanent odour and other virtues that are aſcribed to it. But the moſt uſeful productions, and thoſe which yield the chief revenue of the town and pachalik of Canea, are the olive-trees, that yield a great quantity of fruit, from which is expreſſed an oil, forming an important branch of the commerce of Candia; although it is here badly manufactured: the inhabitants being ignorant of the art of refining it, and rendering it agreeable to the taſte. It is purchaſed by the Europeans only for their ſoap-houſes and manufactories. At Canea there are 20 ſoap houſes, which employ the oils of the provinces of Kiſſamos, Selino, and Cidonia; and theſe are ſo plentiful, that the French houſes eſtabliſhed in this town diſpatched to Marſeilles, during the year of the gathering and the following, to the value of from one to two millions of French livres. About a quarter of a league to the eaſt of Canea is a riſing ground, leading to calcareous hills, which advance into the ſea and form a peninſula terminated by Cape *Melecca*. Among theſe hills on a beautiful ſituation lies the monaſtery of the "Trinity," which is inhabited by a great number of friars, all of whom almoſt apply themſelves to the culture of the land. In the environs of the monaſtery are ſome ſuperb orchards of olive-trees, a few vineyards, and fields deſtined to the cultivation of different ſpecies of corn. Here are alſo many bees and a great number of goats and ſheep. In the garden was ſeen a ricinus or palma Chriſti planted twelve years ago, which indicated by its vigour that moſt of the plants of the warmeſt climates might be introduced into this iſland. Further towards the cape lies the monaſtery of "St. John." In the vicinity of Canea are huts erected for the accommodation of perſons infected with the leproſy, who are prohibited from all intercourſe with healthful perſons, and who ſubſiſt on the produce of a ſmall garden adjoining to their cottage, or poultry they rear, and on the alms of paſſengers. On the edge alſo of the road that leads to the only gate which Canea has on the land ſide, are expoſed the bodies of criminals, who have undergone the terrible puniſhment of empalement. They are ranged on each ſide of the road; and in this dreadful rank are ſeen men whoſe bodies are longitudinally tranſpierced by a ſtake, ſome dead, others expiring: ſome ſmoking their pipe with as much ſangfroid as if they were ſitting on cuſhions, railing at the Europeans, and living as long as 24 hours, in the moſt excruciating torments. In a field near Canea, Sonnini witneſſed the dance, mingled with ſinging, called "Romeca" which the preſent Greeks have received from their anceſtors, and which they have preſerved nearly with all its appendages. Canea is about 70 miles W. of Candia. N. lat. 35° 28'. E. long. 24° 15'.

CANEBEUM, in *Ancient Geography*, a town of Aſia Minor in Caria, mentioned by Steph. Byz. who ſays, that it was alſo called *Cyon*.

CANEFIELD, in *Geography*, a town of North America, in the ſtate of South Carolina; 6 miles N.N.W. of Queenborough.

CANELLA, in *Botany*. Murray Syſt. Veg. 443. Schreb. 817. Willd. 942. Gært. 486. Vent. 3. p. 160. (Winterania, Linn. gen. 598. Juſſ. p. 263. Winterana, Lam. Illuſt. pl. 399. Venterane, Boſ. nouv. dict.) Gen. Ch. *Cal.* one-leafed, deeply divided into three lobes; lobes roundiſh, concave, permanent. *Cor.* Petals five, longer than the calyx, oblong; nectary pitcher-ſhaped, the length of the petals. *Stam.* Filaments none; anthers twenty-one; (ſixteen, Schreb. from 12 to 20. Gært.) linear, parallel, adhering longitudinally to the outſide of the nectary. *Piſt.* Germ. ſuperior, within the nectary, egg-ſhaped, three-celled; ſtyle cylindrical, the length of the nectary; ſtigmas two or three, blunt, convex, wrinkled. *Berry* three-celled, one or two of the cells generally abortive. *Seeds* two, roundiſh-kidney-ſhaped. Eſſ. Ch. Calyx three-lobed. Corolla five petalled; anthers adhering to a pitcher-ſhaped nectary. Berry three-celled.

Sp. C. *alba*. Cluſ. exot. lib. 4. cap. 4. Swartz in Linn. Tranſac. vol. i. tab. 8. Woodville Med. Bot. p. 318. tab. 117. (C. peruana, and C. tubis minoribus alba, Bauh. pin. p. 409. 2, 3, and 4. Park theat. 1581. C. cubane, Johnſ. dendr. 165. C. cinnamomea, Pluk. phyt. tab. 160. f. 7. C. winterana, Gært. fruct. tab. 77. fig. 2.) A tree. *Stem* from 10 to 50 feet high, ſtraight, branched only at the top; bark whitiſh; branches erect, not ſpreading. *Leaves* petioled, alternate, but not regularly, oblong, acuminate, entire, thick, dark green, ſhining. *Flowers* in terminal, compound corymbs, violet, ſmall, ſeldom opening; lobes of the calyx roundiſh, concave, incumbent, ſmooth, membranous; petals concave, erect, thick, deciduous. *Berry* globular, fleſhy, ſmooth, black. *Seeds* fixed to the central angle of the cells, regularly two in each cell, but one or two cells are generally abortive, and ſometimes only one diſcernible, of different ſhapes, according to the number of abortive germs and cells, always black, ſmooth, and ſhining. Swartz and Gært. The whole tree is very aromatic, and when it is in bloſſom perfumes the whole neighbourhood. The flowers dried and ſoftened again in warm water have a fragrant odour, nearly approaching to that of muſk. The leaves have a ſtrong ſmell of laurel. The berries have a faint aromatic taſte and ſmell, and are greedily eaten by the white-bellied and bald-pate pigeons (*Columba jamaicenſis* and *leucocephala*), who acquire from them that peculiar flavour which is ſo much admired. Its bark, which in taſte is moderately warm, aromatic, and bitteriſh, and has an agreeable ſmell, reſembling that of cloves, was formerly a common ingredient in the food and drink of the Caraibs, and at preſent is a neceſſary addition to the meagre pot of the negroes. It is brought to Europe in long quills, which are about three quarters of an inch in diameter, ſomewhat thicker than cinnamum, and both externally and internally of a whitiſh or light brown colour, with a yellowiſh hue, and commonly intermixed with thicker pieces, which are probably obtained from the trunk of the tree. Its virtues are extracted moſt powerfully by proof ſpirit. It has long ſuperſeded the uſe of the Cortex winteranus, with which it was confounded, firſt by John Bauhin, and afterwards by Linnæus, who, in the firſt edition of the Species Plantarum, united the two plants under the name of *laurus winterana*, but in the enſuing editions made it a diſtinct genus, and called it *winterania.* The true codex winteranus brought by captain Winter from the ſtraits of Magellan in the latter end of the 16th century, and deſcribed by Cluſius, was, in conſequence of this miſtake, very rare, and imperfectly known in Europe for nearly a century, but has been recently brought again to light by the late Dr. Fothergill, with the aſſiſtance of the late Dr. Solander. See WINTERA *aromatica.*

The bark of canella alba, which has been received into the London and Edinburgh Pharmacopœias, inſteadof the old bark of Winter, has been ſuppoſed to poſſeſs conſiderable medicinal virtues, and to be an uſeful medicine in the ſcurvy and ſome other complaints; but is now conſidered merely as an aromatic, and is chiefly employed for the purpoſe of correcting, and rendering leſs diſagreeable, the more powerful and nauſeous drugs. It is, therefore, an ingredient in the Pulv. Aloet. Pharm. Lond. and in the Tinctura amara, Vinum amarum, Vinum rhei, &c. of the Pharm. Edinb. See Swartz's Botanical Hiſtory of the Canella Alba, in the Tranſactions of the Linnæan Society, vol. i. p. 96. t. 2. p. 318. and Woodville's Medical Botany, vol. ii. p. 318. This tree is too tender to live in England out of a ſtove. It may be raiſed from freſh ſeeds procured from the Weſt Indies, but is not readily propagated either by layers or cuttings.

CANELLA, in *Geography*, formerly called the *kingdom of Cota*, a large diſtrict of the iſland of Ceylon, containing a great number of cantons, principally occupied by the Dutch, and famous for the quantity of cinnamon, which it produces. It has ſeveral towns, forts, and harbours, on the coaſt. The interior is inhabited by the natives, and it has rich mines of rubies, ſapphires, topazes, cats-eyes, and other precious ſtones.

CANELLA *Alba*. The canella of the Materia Medica, is the inner bark of the *canella*, (which ſee) a very common tree in the Weſt Indies. This bark is brought over in long quills, much thicker than cinnamon, ſmooth, and brittle, and of a white or whitiſh yellow colour. To the taſte it is extremely pungent, and ſomewhat bitter, and is not very grateful. It yields its ſenſible qualities both to water and ſpirit, and has the common chemical characters of all the aromatic barks On account of its extreme pungency it is ſeldom uſed.

CANELLI, a town of Piedmont, in the county of Aſti; 12 miles S.S.E. of Aſti.

CANELOS, a town of Portugal, in the province of Tra-los-Montes; 5 miles N.N.E. of Lamego.

CANEM, or KANEM, a name ſometimes given to the country of Africa, called *Bornou*, which ſee. See alſo KANEM.

CANENTELOS, or CARANTONUS, *Charento*, in *Ancient Geography*, a river of Gallia Aquitaniæ. Ptolemy.

CANENTES, in *Natural Hiſtory*, a name uſed by ſome of the older writers for a ſpecies of foſſil ſhell not known to us in its recent ſtate, but deſcribed by Klein under the name of the *tubulus marinus concameratus*, and by other of the late authors under thoſe of *polythalamium* and *orthoceratites*.

CANEPHORÆ, Κανηφοροι, from κανης, *a reed*, and φερω, *I bear*, in *Antiquity*, were two virgins of quality at Athens kept in Minerva's temple in the Acropolis, who at the feaſt of the Panathenæa, carried baſkets on their heads with ſomething ſecret or myſterious therein, and delivered to them by the prieſteſs. The baſkets were uſually crowned with flowers, myrtles, &c.—The canephoræ, in theſe ceremonies, always marched the firſt, the prieſt next, and the choir of muſic followed.

The learned are at variance about the contents of the baſkets borne by the canephoræ. Some will have it, that neither they, nor the prieſteſs herſelf, knew what was in them. Others conjecture that they contained the things neceſſary for ſacrifice, &c.

There were alſo canephoræ in the ceremonies of Ceres and Bacchus. Thoſe in the Bacchanalia carried golden baſkets, in which were divers ſorts of firſt fruits, &c. Among ancient monuments, we find mention of divers figures of canephoræ. In that famous cornelian, called Michael Angelo's ring, there are three canephoræ with their baſkets on their heads.

The appellation canephoræ was alſo given to virgins at Athens, when becoming marriageable, they preſented certain baſkets full of little curioſities to Diana, in order to procure leave to quit her train, and change their ſtate of life.

CANEPHORIA was a ceremony, which made part of a feaſt celebrated by the Athenian virgins on the eve of their marriage day. The canephoria, as practiſed at Athens, conſiſted in this; that the maid, conducted by her father and mother, went to the temple of Minerva; carrying with her a baſket full of preſents, to engage the goddeſs to make the marriage happy: or rather, as the ſcholiaſt of Theocritus has it, the baſket was intended as a kind of honourable amends made to that goddeſs, the protectreſs of virginity, for abandoning her party; or it was a ceremony to appeaſe her wrath.

CANEPHORUS, in *Botany*, (κανηφορος, baſket-bearing, ſo called from the ſhape of its compound flowers.) Juſſ. 208. Willd. 356. Boſc. nouv. dic. Claſs and order, *pentandria monogynia*. Nat. Ord. *rubiaceæ*, Juſſ.

Gen. Ch. *Cal.* Perianth common tubular, toothed, incloſing from three to ſix ſeſſile flowers on a chaffy receptacle; perianth partial, five or ſix-cleft. *Cor.* monopetalous, bell-ſhaped, five or ſix-cleft. *Stam.* Filaments none; anthers five or ſix, oblong. *Piſt.* Stigma two-cleft. *Fruit* pea-ſhaped, inferior, two-ſeeded. Juſſ.

Eſſ. Ch. Calyx common tubular, toothed, many-flowered. Perianth five or ſix-cleft. Corolla bell-ſhaped, five or ſix-cleft. Fruit inferior, two-ſeeded. Willd.

Sp. 1. C. *axillaris*, Lam. Ill. Pl. 151. fig. 1. "Leaves roundiſh, egg-ſhaped; flowers ſolitary, axillary." Leaves oppoſite, narrowing into ſhort petioles, entire. 2. C. *capitata*, Lam. Illuſt. Pl. 151. fig. 2. "Leaves lanceolate; flowers terminal, aggregate, involucred." *Leaves* oppoſite, nearly ſeſſile; entire. *Flowers* three or four together; leaflets of the involucre numerous, briſtle-ſhaped. Both ſpecies found by Commerſon in the iſland of Madagaſcar.

CANES, in Egypt and other Eaſtern countries, a poor ſort of buildings for the reception of ſtrangers and travellers. People are accommodated in theſe with a room at a ſmall price, but with no other neceſſaries; ſo that, excepting the room, there are no greater accommodations in theſe houſes than in the deſerts, but that there is a market near.

CANES *Venatici*, in *Aſtronomy*, the *Grey-hounds*, two new conſtellations, firſt eſtabliſhed by Hevelius, between the tail of the Great Bear, and Bootes' arm, above the Coma Berenices. The firſt is called *Aſterion*, being that next the Bear's tail: the other *Chara*. They comprehend 23 ſtars, of which Tycho only obſerved two. In the Britiſh catalogue they are 25.

CANESCENS, in *Entomology*, a ſpecies of *Apis* mentioned by Lepechin in his travels through Siberia. This inſect is hoary, ſnout incurved, horny, projecting from a conic veſicle: abdomen with obſcure blotches. Inhabits near the Caſpian ſea.

Canescens, a ſpecies of Cantharis found in Saxony. The thorax is yellow: ſternum and elytra obſcure cinereous. Schall.

Canescens, in *Ichthyology*, a ſpecies of Chætodon that inhabits South America and India. The tail of this fiſh is bifid: firſt and ſecond ray of the dorſal fin ſpinous, the third very long; mouth bidentated. Gmel. Linn. Syſt. &c. Figured by Seba, v. 3. pl. 25.

Canescens, in *Ornithology*, a ſpecies of Motacilla, that inhabits New Holland, the plumage of which is hoary-brown above, and white beneath; head black; front ſtreaked with white; breaſt and vent lineated with black; ſpot on the wings, and edge of the tail-feathers at the baſe tawny. Called by late writers the Van Diemen's warbler.

CANET, in *Geography*, a town of France, in the department of the Eaſtern Pyrenées; 5 miles E. of Perpignan.—Alſo, a town of France, in the department of Herrault; 10 miles S.E. of Lodeve.

CANETE. See Cagnate.

CANETHUM, in *Ancient Geography*, a mountain of Greece in Bœotia.—Alſo a place of Greece, in the iſland of Eubœa.

CANETO, in *Geography*, a town of the duchy of Mantua, ſeated on the river Oglio; 20 miles W. of Mantua. N. lat. 40° 55′. E. long. 10° 45′.

CANEVAS, *Fr.* an outline for a poet or muſician to colour. The French chiefly uſe the term in writing words to favourite airs in a ballet; which, after being danced to inſtruments, is impreſſed more deeply in the memory of the audience by being ſung. The word ſeems to be uſed with more propriety when applied to a ſlow and pathetic air, left by the compoſer, as a mere ſketch for the finger to grace and embelliſh. See Cantabile.

CANFRANC, in *Geography*, a town of Spain, in Arragon, 3 leagues N. of Jaca.

CANGA, called by the Portugueſe Cangua, and in China *Cha*, in the *Chineſe Police*, a wooden clog or collar borne on the neck, by way of puniſhment for divers offences.

The canga is compoſed of two pieces of wood notched, to receive the criminal's neck, and this frame of wood has alſo two ſmall holes for the hands of the offender. The load lies on his ſhoulders, and is more or leſs heavy according to the quality of his offence. Some cangas weigh 200 pounds; but moſt of them from 50 to 60 pounds. It is a kind of permanent and ambulatory pillory, which the culprit is ſometimes ſentenced to wear for weeks or for months. The duration of this puniſhment for having broken the peace, or diſturbed a family, or for being a notorious gambler, is generally three months. Although he is ſuffered to walk about, or ſtationed for a certain ſpace of time either in ſome public ſquare, or at the gate of a city or a temple, and occaſionally to reſt under this heavy and degrading burden; yet if the offender is thought by the ſubordinate officer of the civil magiſtrate to have reſted too long, he is beaten with a whip made of leather thongs till he riſes. The mandarins condemn to the canga. When the time of his puniſhment is expired, he is again brought before the mandarin, who exhorts him in a friendly manner to amend, frees him from the canga, and diſcharges him after he has received twenty heavy blows.

CANGANI, *promontory of*, in *Ancient Geography*. See Cangani.

CANGAREE, in *Geography*, a river of America, in South Carolina, formed by the union of the Saluda and Tyger; about 5 miles N.W. from Columbia.

CANGE, Charles Du Fresne Du, in *Biography*, an eminent linguiſt and antiquary, was born in 1610, at Amiens, where, after attending the bar for ſome time at Paris, he devoted himſelf to the ſtudy of the learned languages, and of ancient and modern hiſtory. In 1645, he obtained the poſt of treaſurer of France; and continued at Amiens, blending literary avocations with the functions of his office, till a peſtilence, which prevailed in his native city, in 1668, obliged him to remove to Paris, where he enjoyed peculiar advantages for the proſecution of his ſtudies. Here he was held in high eſtimation for his extenſive learning, for the modeſty and diffidence with which he always expreſſed himſelf concerning his own talents and literary performances, and for the condeſcenſion and affability, which eminently diſtinguiſhed his ſocial intercourſe. After having enjoyed, for 50 years, without intermiſſion, a good ſtate of health, he was ſeized, in 1688, with a retention of urine, which, in a few months, terminated his life. Of his learned works, which were numerous, the following are the principal; viz. "Hiſtory of the Empire of Conſtantinople under the French Emperors," Paris, 1657, fol. "Hiſtory of St. Louis, King of France, by the Sieur de Jouville, illuſtrated with new Remarks and hiſtorical Diſſertations, &c." Paris, 1668, fol. "Joannes Cinnamus's Six Books of the Hiſtory of the Affairs of John and Manual Comnenus, Gr. and Lat. with hiſtorical and philoſophical Notes, &c." Paris, 1670, fol. "A Memoir upon the Plan of a new Collection of the Hiſtorians of France," inſerted in Le Long's Bibliotheque Hiſtorique de la France." "Gloſſarium ad Scriptores mediæ et infimæ Latinitatis, &c." Paris, 1678, 3 vols. fol.; Francof. 1681 and 1710, 3 vols. fol.; reprinted in 1733, by the Benedictines of St. Maur, and augmented with 4 new volumes by the abbé Carpentier. To this work Du Cange owes his chief reputation. It is of ſingular uſe to thoſe who ſtudy the writings and records of the middle ages, and abounds with many intereſting and amuſing anecdotes. "Cyrilli, Philoxeni, alterumque Veterum, Gloſſaria, Latino-Græca et Græco-Latina," 1679, fol. "Hiſtoria Byzantina, duplici Commentario illuſtrata, &c." Paris, 1680, fol. containing the genealogies of the emperors of Conſtantinople, and an accurate deſcription of the ſtate of that city under theſe emperors. "Joannis Zonaræ Annales ab Exordio Mundi ad Mortem Alexii Comneni, &c." Paris, 1686, 2 vols. fol. "Gloſſarium ad Scriptores mediæ et infimæ Græcitatis; accedit Appendix ad Gloſſarium mediæ et infimæ Latinitatis, uná cum brevi etymologico linguæ Galliæ ex utroque Gloſſario," Paris, 1688, 2 vols. fol. "Chronicon Paſchale a Mundo condito ad Heraclii Imperatoris annum vigeſimum," Paris, 1689, fol. Whilſt this work was in the preſs, the learned author died; and it was completed and publiſhed by M. Baluze. His MSS., which were numerous, are preſerved in the king's library. Gen. Dict. Nouv. Dict. Hiſtor.

CANGI, Ceangi, or Cangani, in *Ancient Geography*, a people of Britain, concerning whoſe ſituation antiquarians have been much perplexed. Camden diſcovered ſome traces of them in many different and diſtant places, as in Somerſetſhire, Wales, Derbyſhire, and Cheſhire; and others have found as plain veſtiges of them in Devonſhire, Dorſetſhire, Eſſex, Wiltſhire, &c. Mr. Baxter, (Gloſſ. Brit. p. 73, &c.) ſeems to have diſcovered the true cauſe of this perplexity, by obſerving that the Cangi, or Ceangi, were not a diſtinct nation ſeated in one particular place, but ſuch of the youth of many different nations as were employed in paſturage, in feeding the flocks and herds of their reſpective tribes. Almoſt all the ancient natives of Britain had their Ceangi, the keepers of their flocks and herds, who ranged about the country in great numbers, as they were invited by the ſeaſon, and plenty of paſture for their cattle. Hence we find traces of their name in many different parts of Britain; but chiefly in thoſe parts which were beſt adapted to paſturage. Theſe Ceangi of the different Britiſh nations, naturally brave, and rendered ſtill more hardy by their way of life, were conſtantly armed for the protection of their flocks from wild beaſts; and theſe arms they occaſionally employed in the defence of their country and their liberty.

CANGIAGIO, or CAMBIASO, LUCA, called LUCHETTO, in *Biography*, one of the moſt eminent of the Genoeſe painters, was born at Oneglia, near Genoa, in 1527, and, being of a volatile diſpoſition, was laid under reſtraint by his father, who was his teacher in the art of painting. At the age of 17, he was employed in painting the front of a houſe in freſco; but whilſt he was commencing his work, ſome Florentine painters who were actually engaged, conceived him to be a mere grinder of colours, and when he took up his pallet and pencils, they wiſhed to have prevented his proceeding with it, leſt he ſhould ſpoil the work. However, after a few ſtrokes of his pencil, they were convinced of their miſtake, and reſpected his ſingular abilities. In the exerciſe of his art, he was uncommonly expeditious and rapid, and as he worked equally well with both hands, his performances were numerous and ſpeedily executed. Of Cangiagio it is remarked, that he practiſed three different modes of painting at three different periods of his life. His firſt manner was gigantic and unnatural, which he corrected, in conſequence of the remonſtrances of his friend Aleſſi, the celebrated architect, for his beſt ſtyle, in forming which he conſulted nature with attention, and digeſted his thoughts in ſketches, before he began to paint. His third manner was diſtinguiſhed by a more rapid execution, to which he recurred in order to make more ample proviſion for his wife and family. The death of his wife was followed by a violent paſſion for her ſiſter, to whom he committed the care of his children. With a view of obtaining a diſpenſation from pope Gregory XIII., he took a journey to Rome, in 1576, and enforced his requeſt by preſenting two pictures to his holineſs. The pope, however, inſiſted that he ſhould diſmiſs his ſiſter-in-law from his houſe. After this unſucceſsful application, he proſecuted the exerciſe of his profeſſion at or near Genoa, and performed ſome admirable works in the convent of St. Bartholomew of the Armenians. He was afterwards invited by Philip II. to adorn the Eſcurial; and he complied with the invitation, in hopes of intereſting this powerful monarch in favour of his unallowed and diſquieting paſſion. But the king's courtiers deterred him from communicating his requeſt, much as his performances were admired, to a prince ſo *religious*. Theſe repeated diſappointments preyed upon his mind, and brought on a lingering complaint, which terminated in his death, at the Eſcurial, in 1585. "A great facility of hand, ſkill in drawing, eſpecially fore-ſhortened figures, and fertility of invention, were the characteriſtic excellencies of this painter; but he failed in grace, ſelection, and the truth of nature." In the royal collection at Paris there are a "Sleeping Cupid," as large as life, and likewiſe "Judith with her Attendant," which do honour to this maſter. In the Pembroke collection at Wilton, there is a picture, repreſenting Chriſt bearing his croſs, which is aſcribed to Cangiagio. D'Argenville. Pilkington.

CANGIAMILA, FRANCIS, EMANUEL, canon of the church at Palermo, and inquiſitor of the iſland of Sicily, where he died, in 1763, publiſhed "Embryologia ſacra, ſive de officio ſacerdotum, medicorum, et aliorum circa æternam parvulorum in utero exiſtentium ſalutem," Palermo, 1761, fol. By the canons of the church of Rome, it has been decreed, that children may be efficaciouſly baptized before they are born, if the water can be made to touch any part of their bodies, or the membranes in which they are involved; and ſurgeons are cautioned to ſee this ceremony performed, whenever, from the difficulty of the labour, the life of the child ſhall appear to be in danger. On the other hand, they are admoniſhed, that to open the head of a child before it is certainly known to be dead, with a view of preſerving the life of the mother, is to commit murder, and conſequently not to be allowed. An abridged edition of this work was publiſhed by the abbe Dinouart, in 1761, and 1766, 12mo. Haller Bib. Anat. Eloy. Dict. Hiſt.

CANGIANO, in *Geography*, a town of Naples in the province of Principato Citra; 27 miles N. of Policaſtro.

CANGOXIMA, CANGOXUMA, or COGOXIMA, is a ſea port on the moſt ſouthern verge of the iſle of Japan. It was the firſt at which the Portugueſe landed, and they afterwards choſe to make it the centre of their commerce, on account of its advantageous ſituation and commodious harbour. The entrance into it is, indeed, dangerous by reaſon of a number of rocks, that lie at ſome diſtance from it; on one of which is ſeated a ſtrong caſtle, ſaid to have been built by Ongoſchio, the grandfather of the emperor Gongon, or Gonjin, with a view of ſecuring the city, which is the key of the kingdom of Saxuma, and of the whole iſland. At the entrance of the haven was conſtructed a ſquare lighthouſe, ſituate on a very high rock, which is viſible at ſea at the diſtance of above 20 miles; and at the foot of the rock is a convenient road for ſhipping. The quay is guarded by a ſtone dyke, which runs into the ſea, and has a ſtone rampart breaſt-high, covered with copper. In each of 2 large wings built at one end of it are ſtationed 500 men, who keep watch night and day, to check the kings of Saxuma, who often revolted in order to avoid paying tribute to the emperors. The town is watered by a river which deſcends from the mountains into a canal formed for receiving it, and from thence it falls with great rapidity into the ſea. On the ſouth ſide of the river is a cuſtom-houſe for receiving duty, beſides other large and ſumptuous magazines belonging to the emperor.

CANHAR, a river of Hindooſtan, which runs into the Soane, 5 miles S.W. of Bidjigur.

CANI, two ſmall flat iſlands of Africa, in the Mediterranean, near the coaſt of Tunis, ſituate about 4 leagues to the north-north-weſt of the cape Pil-loe, and very nearly in the middle way to cape Blanco. Theſe iſlands ſeem to occupy the ſituation aſſigned by Ptolemy to his Inſula Dracontia. N. lat. 37° 45′. E. long. 10° 30′.

CANI, *Grotto del.* See GROTTO *del Cani.*

CANJA, in *Nautical Language*, a veſſel employed on the Nile, and repreſented by Mr. Bruce as commodious, ſafe, and expeditious in ſailing. That which he deſcribes (Travels to Africa, Vol. I. p. 43.) was about 100 feet from ſtem to ſtern, with two maſts, main and foremaſt, and two monſtrous latine ſails, the main-ſail-yard being about 200 feet in length; about 30 feet in the beam, and about 90 feet in keel. The keel is not ſtraight, but a portion of a parabola whoſe curve is almoſt inſenſible to the eye, but having this advantageous effect in ſailing, that as the bed of the Nile, when the water becomes low, is full of ſand-banks under water, the keel under the ſtem, where the curve is greateſt, firſt ſtrikes upon theſe banks and is faſt, but the reſt of the veſſel is afloat; ſo that by the help of oars and aid of the ſtream, furling the ſails, you eaſily get off; whereas, if the keel were ſtraight, and the veſſel advanced with the preſſure of its immenſe main-ſail, it muſt remain immoveable upon the bank, and be wrecked. When this veſſel is proceeding up the ſtream, before the wind, the yard and ſail are never lowered. The ſailors climb and furl it as it ſtands. When they ſhift the ſail, they do it with a thick ſtick like a quarter-ſtaff, which they call a "noboot," put between the laſhing of the yard and the ſail; they then twiſt this ſtick round till the ſail and yard turn over to the ſide required. When the veſſel returns, they take out the maſt, lay down the yards, and put by their ſails, ſo that the boat deſcends like a wreck broadſide forwards; otherwiſe being ſo heavy a-loft, were ſhe to touch with her ſtem going down the ſtream, ſhe would not fail to carry away her maſts, and perhaps be ſtaved to pieces. The cabin of this veſſel has a very decent and agreeable dining-room, about 20 feet ſquare, with windows that have cloſe and latticed ſhutters, ſo that they may be opened at pleaſure in the day-time, and admit the freſh air; but they ſhould be carefully kept ſhut at night. See *Plate of Ship*.

CANIADERAGO, in *Geography*, a lake of North America, in the county of Otſego or Oſwego, and ſtate of New York. It is as large as the Oſwego lake, and 6 miles weſt of it. From this lake iſſues a ſtream, called Oaks creek, which falls into Suſquehannah river, about 5 miles below Oſwego. The beſt cheeſe in the ſtate is made on this creek. N. lat. 42° 43′. W. long. 75°.

CANICODEO, *creek*, a ſouth-weſt head-water of Tioga river in New York, which interlocks with the head-waters of Geneſſee river, and joins Coneſteo creek, 26 miles W.N.W. from the Painted Poſt.

CANICULA, in *Ichthyology*, a ſort of SQUALUS, or Shark, that ſwarms in all the European ſeas, and preys on fiſh. The Engliſh fiſhermen are well acquainted with this voracious creature by the name of the Spotted Dog-fiſh, the head, back, ſides, and fins being marked with large diſtinct black ſpots on a browniſh ground, with only the belly and lower part of the ſides white. This fiſh ſeldom exceeds the length of four, or at moſt, five feet. The ſkin, when dried, is uſeful for various purpoſes. The ſpecies is known by having the noſtrils ſurrounded by a lobe and vermiform appendage, and the ventral fins diſtinct; a character that muſt be attentively conſidered, in order to determine the *Squalus Canicula* from its very analogous ſpecies *Squalus Catulus*, the latter differing principally in being of a ſmaller ſize, and having the ventral fins united. Vide Donov. Brit. Fiſhes.

Obſ. This is the Linnæan Squalus Canicula, Squalus conducta of Oſbeck; Catulus major of Jonſton, and Rouſſette of moſt French writers.

CANICULA, in *Aſtronomy*, is a name given to one of the ſtars of the conſtellation CANIS *major*; called alſo ſimply the *Dog-ſtar*; by the Greeks, Σειριος, *Sirius*.

Pliny and Galen alſo give the appellation Procyon to the *Canicula*; though, in propriety, PROCYON is the name of another ſtar, in the Leſſer Dog.

*Canicula* is the tenth in order in the Britannic Catalogue; in Tycho's and Ptolemy's it is the ſecond. It is ſituate in the mouth of the conſtellation, and is of the firſt magnitude; being the largeſt, and brighteſt, of all the ſtars in the heavens.

From the heliacal riſing of this ſtar, that is, its emerſion from the ſun's rays, which now happens about the 11th day of Auguſt, the ancients reckoned their *dies caniculares*, or dog-days.

The Egyptians and Ethiopians began their year at the riſing of *Canicula*; reckoning to its riſe again the next year, which is called the *Annus Canarius*.

CANICULAR *days*, properly denote a certain number of days, preceding and enſuing the heliacal riſing of Canicula, or the Dog-ſtar, in the morning; to which the ancients aſcribed an extraordinary influence.

This opinion, equally erroneous and ſuperſtitious, ſeems to have originated with the Egyptians, who, obſerving the riſing of the Dog-ſtar, which anciently took place in Egypt about the time of the ſun's arrival at the ſummer tropic, when the Nile began to riſe, upon the overflow of which the fertility of their country depended, were induced to pay divine honours to this ſtar. They imagined that it not only indicated the time of the Nile beginning to riſe, but that it was the efficient cauſe of its overflowing, or of the fertility connected with this circumſtance. From the colour of the ſtar at its firſt appearance, they formed prognoſtics what kind of ſeaſons they were to expect; ſo that if it were of a golden colour, they thought it preſaged a fruitful year; but if it appeared pale and dim, they regarded it as a bad omen, that portended a ſcarcity. They fancied alſo, that the Dog-ſtar riſing with the ſun and joining his influence to the fire of that luminary, was the cauſe of the extraordinary heat which uſually falls out in that ſeaſon; and accordingly they gave the name of the *dog-days* to about ſix or eight weeks of the hotteſt part of ſummer. The Greeks, in imitation of the Egyptians, their maſters in idolatry and ſuperſtition, as well as ſcience, held the ſame opinion, that the dog-ſtar was the cauſe of that ſultry heat ſo often pernicious to the health and life of man. Homer, (Iliad l. xxii. v. 30.) comparing the ſhining of the armour of Achilles, whoſe fury was ſo fatal to the Trojans, to the pernicious blaze of the Dog-ſtar riſing at the end of ſummer, calls it an ill omen, "portending heat intenſe to wretched mortals;" or as the ſenſe of the paſſage is well expreſſed by Pope:—

> ————————"his burning breath
> "Taints the red air with fevers, plagues, and death."

When the father of the poets had expreſſed himſelf in this manner, it is no wonder that others ſhould ſpeak of the rage of the dog-ſtar, as ſome of them do of the fury of the lion, (Hor. l. iii. Od. 9. Virg. Æn. l. x. v. 270.) becauſe a ſtar of the firſt magnitude, called the Lion's heart, riſing in the time of the dog-days, was alſo thought to contribute towards the great heat of that ſeaſon.

Some authors tell us, from Hippocrates and Pliny, that on the day the Canicula firſt riſes in the morning, the ſea boils, wine turns ſour, dogs begin to grow mad, the bile increaſes and irritates, and all animals grow languid; and that the diſeaſes ordinarily occaſioned in men by it are burning fevers, dyſenteries, and phrenſies. Although Hippocrates had a ſentence or aphoriſm that ſeems to forbid the uſe of purging medicines in the dog-days, we muſt not conclude from hence that great phyſician and philoſopher to have thought the influence of the Dog-ſtar conſiderable. It is probable, that he only meant to point out the hot time of the year, commonly marked by the riſing of the Dog-ſtar. The Romans ſacrificed a brown dog every year to Canicula at its riſing, to appeaſe its rage. They ſuppoſed Canicula to be the occaſion of the ſultry weather, uſually felt in the dog-days.

As to the dog-days attended to by ſome with ſo much ſuperſtitious regard, it is pleaſant to obſerve what variety of opinions have prevailed both among the ancients and moderns about the beginning and the end of them. This variety is, in ſome inſtances, owing to the ignorance of the writers, who did not know or conſider that the Dog-ſtar varies in the time of its riſing in any one year as the latitude varies, and that it is always later and later every year in all latitudes; ſo that in time, this ſtar, by the ſame rule, may chance to be charged with bringing froſt and ſnow, when he riſes in winter. In an ancient calendar preſerved by Bede, the beginning of the dog-days was placed on the 14th of July. In one prefixed to the common prayer, printed in the time of queen Elizabeth, they are ſaid to begin on the 6th of July, and to end on the 5th of September; and this was continued from that time till the reſtoration, when that book was reviſed, and the dog-days omitted. From that time to the correction of the Britiſh calendar, our almanacs had the beginning of the dog-days on the 19th of July, and the end on the 28th of Auguſt: but ſince that correction, the times of the beginning and end have been altered; and the former was placed at the 30th of July, and the latter at the 7th of September. The dog-days have been commonly reckoned for about 40 days, viz. 20 days before, and 20 days after the heliacal riſing; and almanac-makers have uſually ſet down the dog-days in their almanacs to the changing time of the ſtar's riſing; and thus they had at length fallen conſiderably after the hotteſt ſeaſon of the year; till of late, a very proper alteration has been introduced into the almanacs, and they have been made to commence with the 3d of July, and to terminate with the 11th of Auguſt. The propriety of this alteration will be evident, if we conſider, that the ancients meant to expreſs by the dog-days, the hotteſt time of the year, which is commonly during the month of July, about which month, the Dog-ſtar roſe heliacally in the time of the moſt ancient aſtronomers, whoſe obſervations have been tranſmitted to us: but the preceſſion of the equinoxes has transferred this heliacal riſing to a much later and cooler part of the year; and becauſe Heſiod tells us that the hot time of the year ends on the 50th day after the ſummer ſolſtice, which brings us to about Auguſt 10, or 11, the above-mentioned alteration ſeems to be not only neceſſary, but very proper.

CANICULAR *year*, denotes the Egyptian natural year, which was computed from one heliacal riſing of Canicula to the next. This is alſo called annus canarius, and annus cynicus; by the Egyptians themſelves the Sothic year, from Soth, a denomination given by them to Sirius. Some alſo call it the heliacal year.

The canicular year conſiſted ordinarily of 365 days, and every fourth year of 366 days, by which it was accommodated to the civil year. The reaſon of their choice of Canicula before the other ſtars, to compute their time by, was not only the ſuperior brightneſs of that ſtar, but becauſe its heliacal riſing was in Egypt a time of ſingular note, as falling on the greateſt augmentation of the Nile, the reputed father of Egypt. Epheſtion adds, that from the aſpect of Canicula, its habit and colour, the Egyptians drew prognoſtics concerning the riſe of the Nile; and, according to Florus, predicted the future ſtate of the year. So that the firſt riſing of this ſtar was yearly obſerved with great attention. Bainbrigge, Canicul. cap. 4. p. 26.

As the Egyptian year of 365 days was about ſix hours ſhorter than the true ſolar year, the heliacal riſing of Sirius gradually advanced, at the rate of nearly one day in the interval of four years; ſo that in 1461 years, it completed a revolution, by riſing on every ſucceeding day of the year, and returning to the point originally fixed for the beginning of the firſt month, called *Thoth*, or *Soth*. This period, equal to 1460 Julian years, was termed the great Egyptian year, or "Canicular cycle." Cenſorinus (De Dei Nat. c. 18.) informs us, that in the conſulate of Antoninus Pius, and Brutius Præſens, A.D. 138, the canicular year was renewed. If we reckon backwards 1460 Julian years, we come to the year B. C. 1322, when the ſun was in 14° of Cancer, that is, 14 or 15 days after the ſummer ſolſtice, which happened on July the 5th. Again, in the beginning of the Nabonaſſarean æra, i. e. B. C. 747, the Thoth, or firſt day of the Egyptian year, had receded to the 26th of February, from July the 20th, when Sirius had been obſerved to riſe heliacally in Egypt. This interval of 144 days, multiplied by four, gives 576 years. The canicular year muſt, conſequently, have begun 576 years earlier than the æra of Nabonaſſar, viz. in the year B. C. 1322, or 1323, which nearly correſponds with the former date. In this matter, great accuracy cannot be expected, as the obſervation of the heliacal riſing or ſetting of a ſtar depends upon the ſtate of the atmoſphere, the difference of latitude, the ſituation of the obſerver, and other circumſtances. Bailly (Hiſt. de l'Aſtron. l. vi. c. 8.) fixes the date of the eſtabliſhment of this period in the year B. C. 2782, on the authority of a paſſage ſaid to have been extracted out of Manetho's hiſtory, which intimates, that the ſhepherds invaded Egypt in the 700th year of the Sothic cycle; and in a vague tradition, that it commenced when Sirius roſe heliacally at the ſummer ſolſtice. But the grounds of this opinion are ſuch as to entitle it to no great regard.

CANICULATUS, in *Conchology*, a ſpecies of MYTILUS that inhabits New Zealand. The ſhell is ſmoothiſh, and brown without, the interior ſurface tinged with various colours, and the ſocket of the hinge grooved. Martyn. &c.

CANICULUM, or CANICULUS, in the *Byzantine Antiquities*, a golden ſtandiſh, or ink veſſel, decorated with precious ſtones, wherein was kept the ſacred *encauſtum*, or red ink, wherewith the emperors ſigned their decrees, letters, &c. The word is by ſome derived from *canis* or *caniculus*; alluding to the figure of a dog, which it repreſented; or rather becauſe it was ſupported by the figures of dogs. By Salmaſius it is derived from κανιον, an inkhorn. The caniculum was under the care of a particular officer of ſtate, hence called *caniclinus* or *canicleus*, who was in great requeſt. Du-Cange will have the *caniclinus* to have been the ſame with the LOGOTHETA.

CANIGOU, in *Geography*, an eminence of the Pyrenées, about 1440 French toiſes.

CANINA, a town of European Turkey, in Albania; ſituate in a diſtrict of the ſame name on the ſea-coaſt, near the gulf of Venice. N. lat. 40° 28′. E. long. 19° 50′.

CANINA, in *Zoology*, a ſpecies of ASCIDIA that inhabits the Atlantic and northern ſeas. It is of an elongated ſhape, round and flaccid, with a red pouch. Müll. Zool. Dan. Obſ. This is the *ſac-animal* of Dicquemar, and *Mentula marina* of Redi. Bohadſch calls it *Tethyum faſciculatum*.

CANINA, a ſpecies of BOA, deſcribed by Linnæus as having 203 abdominal plates, and 77 caudal ſcales. This beautiful ſnake is an inhabitant of South America; where it frequently rolls itſelf round trees, from whence it can the more readily perceive and dart upon its prey. The uſual length of this ſnake is about four feet, and its thickneſs moderate in proportion. Its head is large, and bears ſuch a ſtriking reſemblance to that of a dog that Linnæus gave it the ſpecific name of canina, in alluſion to that circumſtance. The colour of the whole animal on the upper parts is of a fine ſaxon-green, with ſeveral ſhort, undulating, tranſverſe white bars down the back, the edges of which are of a deeper green than the ground-colour of the body: the abdomen is white.

Boddaert ſpeaks of a ſpecimen of this boa in which the abdominal plates amounted to 208 inſtead of 203, at the ſame time that the ſub-caudal ſcales were exactly the ſame in number as Linnæus deſcribes them. That examined by Gronovius differed in both particulars from the Linnæan ſpecimen, having 205 abdominal plates and 79 ſub-caudal ſcales.

Laurenti deſcribes this ſpecies under the title of boa thalaſſina:

laſſina: Seba by thoſe of Serpens Bojobi braſilienſis, Tetrauchoatl Tleola, and Luſitanis Cobre verde.

There is another kind of ſnake very cloſely allied to the above ſpecies, that inhabits the Eaſt Indies, and is ſuppoſed by Gmelin to be a variety only of the ſame ſnake. Laurenti calls it Boa aurantiaca, and Seba Serpens Bojobi ceylonica: the ground colour is of a fine orange: the dorſal bands pale yellow, edged with red, and the abdomen pale yellow.

CANINANA, the name of a ſpecies of ſerpent found in America, and eſteemed one of the leſs poiſonous kinds. It grows to about two feet long, and is green on the back, and yellow on the belly. It feeds on eggs and ſmall birds; the natives cut off its head and tail, and eat the body as a delicate diſh. Ray.

CANINE, in a general ſenſe ſomething that relates to dogs.

Canine *appetite, appetentia et fames canina.* See Bulimia.

Canine *laughter, riſus caninus*, that wherein the lips are drawn far back, and the mouth much extended.

Canine *ligament*, is that whereby the prepuce of the human penis is faſtened to the glans, otherwiſe called the frænum.

Canine *madneſs, rabies canina.* See Hydrophobia.

Canine *ſulphur*, a ſort of native ſulphur, diſcovered near Reggio, intermixed with earthy or ſtony matters; thus called by reaſon that dogs are ſo fond of it, as to dig it out of the earth.

Canine *teeth; canini dentes.* See Teeth.

Caniné, in *Geography*, a town of Africa, in the kingdom of Angola; ſeated on the river Lucala, S. lat. 8° 56′. E. long. 17° 28′.

Canini, Angelo, in *Biography*, a learned grammarian of the ſixteenth century, was born in a ſmall city in Tuſcany, called Anglara, or Anghiari; and employed himſelf for ſeveral years in teaching the Oriental languages in Venice, Padua, Bologna, Rome, Spain, and France. At Paris he had for his ſcholar, Andrew Dudith, an Hungarian, afterwards celebrated for his learning and embaſſies. At length he entered into the ſervice of William du Prat, biſhop of Clermont; and he died in Auvergne in 1557. His "Inſtitutiones Linguæ Aſſyriacæ atque Thalmudicæ, una cum Æthiopicæ atque Arabicæ Collatione, &c." Paris, 1554, 4to. are much eſteemed. His "Greek Grammar," or "Helleniſmi." Paris, 1555, 4to. has been highly commended; and by Tanaquil Faber of Saumur, who prefers Caninius before all other grammarians, it is denominated "The Treaſure of Helleniſm." "A Latin Tranſlation of Simplicius's Commentary upon Epictetus's Manual," printed at Venice in 1546, fol. is attributed to this author. Gen. Dict.

Canini, in *Ancient Geography*, a country of Rhætia, ſuppoſed to be that of the Griſons.

Caninus *muſculus*, in *Anatomy*, the ſame as *elevator labii ſuperioris*, which ſee.

CANIOPOLIS, in *Ancient Geography*, the name of an ancient epiſcopal town of Thrace, mentioned in the acts of the council of Sardica, held in 347.

CANIPSA, or Capsina, a town of Arabia Felix, ſeated on the Perſian gulf; W. of the mouth of the river Lar. Ptolemy.

CANIS, in *Zoology*, a ſpecies of Ascaris, that infeſts the inteſtines of the common dog. This kind is diſtinguiſhed by having the tail pointed, the head flat, and furniſhed on each ſide with a wing-like membrane, and the ſpermatic veſſels curled. Wern. Verm. Inteſt. &c.

Canis, a genus of the Mammalia Feræ, diſtinguiſhed by the following character: fore teeth, upper ſix; lateral ones longer, diſtant; intermediate ones lobate; lower ſix, lateral ones lobate: tuſks ſolitary and incurvated; grinders ſix, ſeven, or more than in others.

This genus comprehends the common dog, *familiaris*, and its varieties, with the ſpecies Lupus, Mexicanus, Thous, Hyæna, Crocuta, aureus, Meſomelas, Lycaon, Vulpes, Alopex, Corſac, Karagan, cinereo-argenteus, virginianus, Lagopus, and Cerdo, which ſee reſpectively.

Canis *Major, the Great Dog*, in *Aſtronomy*, a conſtellation of the ſouthern hemiſphere, below Orion's feet, though ſomewhat to the weſtward of him; whoſe ſtars Ptolemy makes 29; Tycho only obſerved 13; Hevelius 51; in the Britannic Catalogue they are 31.

It is unneceſſary to advert to the fables of the Greeks concerning the elevation of the dog to the heavens, as the origin of this conſtellation, as well as of its other name Sirius, is more probably to be found in the ſuperſtition of the Egyptians; who, as we have already obſerved, (See Canicular *days*), carefully watched the riſing of this ſtar, and judging by it of the ſwelling of the Nile, called the ſtar the centinel and watch of the year. Hence, according to their mode of hieroglyphic writing, they repreſented it under the figure of a dog; they alſo called this ſtar Iſis, the name given to their great goddeſs, and Thoth, the name of their god Mercury, whom for his ſagacity in the invention of letters, arts, and ſciences, they ſometimes painted in the form of a dog, or of a man with a dog's head, and worſhipped him under the name of "Anubis," which ſee. They called the ſame ſtar "Sothis," or Siothi," which, in the Egyptian language, according to Kircher, ſignifies holy. Sidor and Siris are alſo other names for the Nile, from whence Voſſius derives Sirius, the Greek name of this ſtar, which was imagined to have ſuch dominion over that river; and alſo Oſiris, the name of one of their principal deities.

Canis *Minor, the Little Dog*, a conſtellation of the northern hemiſphere; called alſo by the Greeks, *Procyon*, and by the Latins *Antecanis* and *Canicula*. This, as well as the former, is one of the old 48 conſtellations. According to the fables of the Greeks, it is one of Orion's hounds: but the Egyptians were probably the inventors of this conſtellation, as well as Canis Major; and they might have given it this figure to expreſs a little dog, or watchful creature, preceding and conducting, as it were, the larger, or riſing before it; hence the Latins have denominated it *Antecanis*, which ſee. The ſtars in the conſtellation Canis Minor are in Ptolemy's Catalogue 2; in Tycho's 5; in Hevelius's 13. In the Britiſh Catalogue they are 14, of which the principal is Procyon.

Canis *flumen*, or Cynos *flumen*, the river of the dog, in *Ancient Geography*, a river of Arabia Felix, which diſcharged itſelf into the Perſian gulf: probably the ſame with the *Lar* of Ptolemy.

Canis *Carcharius*, in *Ichthyology*. See Squalus Carcharis.

Canis *Galeus*. See Squalus Galeus.

Canis *Volans*, in *Zoology*, a name indiſcriminately given by old writers to the vampire and ternate bat, Veſpertilio Spectrum and Vampyris. Canis volans was alſo called veſpertilio cauda nulla, both the above being of the tailleſs kind of bats. Canis volans ternatanus orientalis of Seba is the Great Bat; Canis volans maxima aurita ex Nova Hiſpana of the ſame writer is the Vampire of Buffon.

CANISBAY, in *Geography*, a ſmall fiſhing town of Scotland, in the county of Caithneſs, and moſt northern part of Scotland; 11 miles N. of Wick.

CANISCHA, a town of Hungary, taken by the Turks in 1600 and retained by them till the year 1690, when it was captured by the imperial troops after a blockade of 2 years, and ceded to the emperor by the peace of Carlowitz; 96 miles S. of Vienna.

CANISIUS, Henry, in *Biography*, a native of Nimeguen, who became profeſſor of canon law at Ingolſtadt, and who was no leſs diſtinguiſhed for his piety and modeſty than for his erudition. He died in 1610. Among his works in law and antiquities, which are highly eſteemed, we may mention his "Summa Juris Canonici;" "Commentarium in Regulas Juris;" "Prælectiones academicæ de Decimis primitiis, &c." and his "Antiquæ Lectiones," 6 vols. 4to. containing a collection of curious pieces relating to the hiſtory and chronology of the middle ages, printed by J. Baſnage, in 7 tomes, 4 vols. fol. Amſterd. 1725; with learned prefaces and remarks by the editor; and notes, with various readings, by Capperonier. Nouv. Dict. Hiſtor.

CANISOLA, in *Geography*, a town of the iſland of Cherſo, in the Adriatic; 22 miles N. of Cherſo.

CANISTER, *Great*, a ſmall iſland in the bay of Bengal, near the coaſt of Siam. N. lat. 12° 58′. E. long. 97° 40′.—*Little Caniſter*, another ſmall iſland in the ſame bay and near the ſame coaſt; 2 leagues S. from the former.—*Weſt Caniſter*, a ſmall iſland in the ſame bay, near the ſame coaſt. N. lat. 12° 37′. E. long. 97° 16′.

CANISY, a town of France, in the department of the Channel, and chief place of a canton, in the diſtrict of St. Lo, 4 miles S.W. of St. Lo. The place contains 838, and the canton 9060 inhabitants; the territory includes 90 kiliometres and 12 communes.

CANITZ, *baron of*, in *Biography*, a German poet and ſtateſman, was of an ancient and illuſtrious family in Brandenburg, and born at Berlin in 1654. After having completed his early ſtudies, he travelled to France, Italy, Holland, and England; and upon his return, he was charged with important negociations by Frederic II. He was alſo employed by Frederic III. Although he was more extenſively known as a politician than a poet, his poems have been much admired by his countrymen, and they were publiſhed for the tenth time in 1750, 8vo. Moſt of them were of the moral elegiac kind, expreſſive either of the tendereſt ſentiments of conjugal affection, or of ſuch reflections as naturally occurred to a contemplative and virtuous mind on the various events of life. Horace is ſaid to have been his model, and his compoſitions are written in a pure and delicate ſtyle. He was eminently learned and ingenious, virtuous and benevolent. Having attained the office of privy counſellor of ſtate, he employed the influence acquired by his diſtinguiſhed character and high ſtation in giving encouragement to literature and the fine arts. The diſeaſe which terminated his life was tedious and lingering, and he obſerved the ſlow but certain approaches of his laſt enemy with the calmneſs and fortitude that became the chriſtian philoſopher. When his phyſicians had pronounced his caſe to be hopeleſs, he ordered a ſkull to be brought to him, and dictated ſome poetical meditations on this object in connection with his own circumſtances, which are juſtly deemed the moſt beautiful of his productions. He retained his cheerfulneſs to the laſt; and juſt before his death, deſired to be led to the window, which he opened: when, having gazed ſome minutes at the riſing ſun, he exclaimed, "O! if the view of a part of the creation can be thus beautiful and reviving, how infinitely delightful muſt be that of the Creator!" He ſpoke, and died, in 1699, at the age of 45. Bildniſſe, &c. or Portraits of celebrated German literati, &c. Berne, 1793.

CANKER, in *Gardening*, a vegetable diſeaſe common in fruit and other trees, produced by a ſort of ulceration in the bark ariſing from bruiſes, the old or dead wood remaining on the trees, and various other cauſes. It is obſerved by the author of the Philoſophy of Gardening, that this diſeaſe may be termed *gangrena vegetabilis*, and that it is a phagedenic ulcer of the bark, which is very deſtructive to apple-trees and pear-trees, as it ſpreads round the trunk or branches, and deſtroys them. Mr. Knight has obſerved "it to be moſt frequent and fatal to thoſe trees the fruit of which has been long in faſhion, having been perpetually propagated for a century or two by ingrafting; which he believes to be a continuation of the old tree, though nouriſhed by a new ſtock; and that the canker is thus a diſeaſe of old age like the mortification in the limbs of elderly people, and ariſes from the irritability of a part of the ſyſtem."

But it ſeems more probable in the opinion of the firſt writer, that "it is an hereditary diſeaſe, as the buds of trees being a lateral progeny, and more exactly reſembling their parents, muſt be more liable to the diſeaſes gradually acquired, or increaſed, by the influence of ſoil or climate, and have not the probability of improvement which attends the progeny of ſexual generation. It is nevertheleſs frequently produced on trees by external violence, as a ſtroke with a ſpade given by a careleſs labourer who is digging near them; but this probably may more eaſily affect the old grafts above-mentioned. When a deſtruction of the bark is thus produced by external violence, it may poſſibly, he ſuppoſes, be cured by the application of a piece of living bark from a leſs valuable tree bound upon it."

It is likewiſe recommended, that "the edges of theſe gangrenous ulcers of the bark ſhould be nicely pared off with a knife, ſo as to admit the air and to prevent the depredations of inſects, and the lodgment of moiſture, which might promote the putrefaction of the ſtagnant juices, and ſpread the gangrene. This ſhould be ſo managed as only to cut away the dead lips of the wound, but not ſo as to injure the living bark. Some thick white paint may then be ſmeared on the naked alburnum, or ſap wood, on a dry day, which may prevent inſects from inſerting their eggs into it, and producing maggots, which erode and deſtroy the wood, and may alſo prevent the dews and rain from rotting it. The paint ſhould, nevertheleſs, be ſo ſpread as not to touch the edges of the wound, as it might injure their growth by its poiſonous quality. A quarter of an ounce of ſublimate of mercury, "*hydrargyrus muriatus*" rubbed with about a pound of white lead-paint renders it more noxious to inſects."

Mr. Forſyth thinks it a miſtake that it always depends upon the nature of the ground, as ſour clays or ſhingly gravels. He contends that it invariably proceeds from the branches to the roots of the trees, and never in the contrary direction.

In the cure of this diſeaſe, when extenſive, he adviſes the careful paring off with a draw-knife or other convenient inſtrument of "all the diſeaſed parts of the bark." And that as the inner white bark is frequently infected, this muſt alſo be cut away, till no appearance of infection remains. The infection in the inner bark appears like dots made with a pen, all of which muſt be cut clean out; for if any part of the canker be left, it will infect the new wood and bark. Wherever you ſee gum oozing out, you may reſt aſſured that the canker is not quite eradicated; which, if ſuffered to remain, will ſpread till the whole tree becomes a maſs of gum and canker, and will be killed in a very ſhort time. When the trunk is become hollow, cut the looſe rotten part clean out, till you come to the ſound wood, taking care to round the edges of the hollow part; then apply the compoſition in a liquid ſtate, laying it on with a painter's bruſh wherever the cankered bark has been pared off or the dead wood cut out, till theſe places are entirely covered with it; when that is done, ſhake ſome of the powder of wood aſhes and burnt bones over the compoſition, and pat it gently down with your hand." See Composition.

He contends, "that if the foregoing directions be carefully followed, the canker will be completely eradicated, and the hollow trunk in time be filled up with ſound wood. When the ſtem is much decayed, he thinks it will be abſolutely neceſſary to open the ground, examine the roots, and cut off all the rotten parts. When you have cut out all the rotten and decayed parts below ground, and ſcraped the hollow clean, make up a maſs of the compoſition, mixed with ſome clay, like what is uſed for grafting; then fill the hollow part with it to within two inches of the ſurface of the ground, treading it in with your foot, or preſſing it in with the hand as cloſe as you poſſibly can, to prevent the wet from penetrating to the roots, and leave the ſurface of the compoſition ſloping from the tree towards the outſide of the border to throw the wet off, which will prevent the freſh part of the root from rotting; then cover the root over with mould level with the reſt of the border;" and, "when you have examined all the old wounds, where large limbs have been cut off, you ſhould next examine the old bark; and if you ſhould find the outſide of it wrinkled and cracked, pare it off, as it is always, when in that ſtate, very much hurt by the canker. This ſhould be done with the draw-knife, or other ſharp inſtrument; then apply the compoſition as before directed, which will bring on a fine ſmooth bark under it. In the ſucceeding winter or ſpring, you will ſee all the plaſter with the old part of the bark that was left in the hollow parts of the tree, or where old branches had been amputated, peeling off and ſhewing the ſmooth bark underneath. You ſhould then ſcrape off, with a wooden or bone knife, what old bark remains in the hollows where the draw-knife could not reach, without cutting too much away. When that is done, mix up ſome freſh cow-dung with ſoap-ſuds and urine, making it very thin, and give the tree a coat of this mixture all over where the bark has been ſcraped off; the cow-dung will adhere to it, and heal the parts where you were obliged to ſcrape to the inner bark. This waſh will, he ſays, remain till the freſh bark comes on; then it will be diſcharged of itſelf, during the ſummer, or the next ſpring, leaving a new freſh bark where the old and cankery was taken off. Next ſpring, if any of the old bark remains, you may repeat the ſame operation, which will cauſe all the remaining old bark to ſlough off like a ſcab from a wound of a human body. By theſe means, he contends, that you will keep your trees in a fine flouriſhing healthy ſtate, and, in general, prevent them from becoming bark-bound. If any of them, notwithſtanding, ſhould be bark-bound, you muſt ſcarify them, by taking a ſharp knife, and running the point of it ſtraight down the middle of the ſtem from top to bottom, taking care to run your knife through the outer bark only; then, with a bruſh, or your finger, rub in ſome of the compoſition, to prevent the inciſion from bringing on the canker."

This operation will cauſe the tree to expand the bark and become very flouriſhing.

And it is adviſed to remember to cut off all the ends of the ſmall ſhoots where the canker had injured them laſt year.

Cut off alſo the old fruit ſtalks, and all the ſmall dead ſtubs, which, if left, will never fail to bring on the canker.

The rough, or cankery bark, or that ſide of trees which is next the wall, ſhould be ſcraped or pared off with a tool made in the form of a ſickle. "It is much," he ſays, "to be regretted, that fruit-trees in general, throughout this kingdom, are in a mutilated, unfruitful ſtate. After gentlemen have purchaſed the young trees from nurſeries, and planted them in their orchards and gardens, they think, ſays he, that every thing neceſſary is done; when, in fact, the greater part of the work is yet to come. In packing a carriage, the ſtems and branches are very frequently bruiſed; in that caſe, the injured parts of the bark and wood muſt be carefully cut out, and the compoſition immediately applied: this may be done when you head the trees, which operation ſhould be performed in April, May, or even June, when the buds begin to ſhoot; but by no means cut off any of the ſhoots, except thoſe that are broken or bruiſed very much. When this is neglected, the canker will follow to the great injury, if not death, of the trees.

"How common, continues he, is it to ſee, in all parts of the country, great numbers of trees ſo affected with this diſeaſe, as not to produce fruit enough in twelve or fourteen years to pay half the expence attending them; whereas, if they were to be managed according to the foregoing directions, they would more than pay all the expence in three years. It is common, when young trees do not thrive, either to blame the nurſery-men for ſending bad or diſeaſed trees, or to attribute their unthriving ſtate to the nature of the ſoil; whereas the fact is, that this frequently ariſes from the inattention or miſmanagement of the perſon who plants and ſuperintends them.

"If the injured and diſeaſed parts be not cut out at an early period, the trees will not thrive, but will become cankery and ſtunted, and cannot be recovered afterwards without a great deal of labour and trouble; whereas, if the directions given for heading trees the firſt year, and cutting out the diſeaſed parts, be attended to, the trees will flouriſh and bear large crops of fine and well-flavoured fruit."

Canker, in *Surgery*, is a popular name for thoſe ſmall eroding ulcers which take place ſpontaneouſly in the cheeks, lips, and gums. This troubleſome ſpecies of ſore is probably connected for the moſt part with a ſtate of debility in the patient; as it is cured by tonic remedies given internally, accompanied with aceſcent diet and country air. It is alſo ſometimes uſeful to touch the ulcer with diluted acids, or a ſtrong ſolution of alum in water.

Canker, in *Veterinary Science*, a dreadful diſeaſe incident to the feet of horſes, and not of unfrequent occurrence, being very troubleſome to cure, and of unſightly appearance, exciting the ſame ſenſations in the mind of horror and diſlike, as do the loathſome animals whoſe names have been applied to it; hence the term *cancer* or *canker*, the *crab*, and the French term *crapaud* or *toad*, and in more ancient times *lupus* or the *wolf*.

We venture, however, to aſſert, that there is nothing ſpecifically poiſonous generated in the ſores of this deſcription, as in the human cancer, though it has been ſo imagined by many; from having ourſelves been frequently inoculated with the ſecretions from theſe ſores, (as have, no doubt, thouſands of others,) without, perhaps, an inſtance of any contagion ariſing from it; nor in the cure is there any ſpecific neceſſary, as in the cancerous, rabid, or venereal poiſonous ulcers.

It may be defined, perhaps, as a ſimple ulceration of the *corniferous*, or horn-bearing parts of the foot, attended with more or leſs weakneſs of the parts in forming horn, and generally of irritation from the horny edges ſurrounding the ſore; nor in the indications of cure is there any ſpecific neceſſary, as we have before obſerved; but the greateſt diligence and attention are requiſite in deſtroying thoſe cauſes of irritation, and in procuring and encouraging the natural growth of the horn over the expoſed parts, which, in old caſes, is found difficult enough.

In deſcribing the ſituation and appearance of this diſorder, we may obſerve, that all parts of the foot that are covered with horn may become the ſeat of this complaint, and its appearance will vary indefinitely, depending upon the greater or leſs degrees of weakneſs of the ſore, or irritation from the ſurrounding horn. The moſt uſual appearance, however, is a light, puffy, fungus, eaſily bleeding when touched, and riſing higher than the edges of the ſurrounding horn, giving out a thin watery diſcharge, with a diſpoſition in the ulcer to ſpread and run under the contiguous horn, and if not timely checked, it will extend itſelf over the whole foot, when the hoof falling off the horſe is neceſſarily loſt. On the other hand, where the proper means of correcting this ulceration are uſed, the contiguous horn is removed, the fungus is reduced, the parts become dry, horn again extends itſelf over the diſeaſed ſurface, and the foot becomes as perfect as it was before.

The time often required to correct the morbid diſpoſition in the part itſelf, and afterwards in procuring the natural growth of the horn, is ſo truly tedious, as, in very bad caſes, to make the expences of keep and cure more than overbalance the value of the horſe, and it would be to the diſadvantage of his proprietor to attempt it; in other caſes it is ſo eaſily ſubdued as to be well worth the time and expence of curing.

The narrative of a caſe or two will be a more impreſſive way of deſcribing the treatment of this complaint than any expoſition in general terms; and for this purpoſe we ſhall ſelect a ſucceſsful and an unſucceſsful caſe, ſuch as they occurred to us; and here let me remark, in doing that juſtice, we wiſh to hold an example of to every one in theſe matters, that among the ſhoeing-ſmiths there are many who take great pride in the cure of this diſorder, and whoſe practice, pretty much confined to this object, has rendered very expert; and as much depends on the adroit uſe of the drawing-knife in removing the horn from the ulcerated parts, they would have vaſtly the advantage over a young practitioner in this reſpect, though in other reſpects their treatment ſhould be the ſame, though theſe have ſometimes failed in bad caſes, or the long protracted cure has rendered it of no real advantage to the proprietors. The diſeaſe, we may obſerve, is almoſt always artificially induced, and may be prevented, which is of vaſtly more advantage to know than the mode of its cure.

The foot of the horſe may be conſidered as partaking ſomewhat of the nature of a gland, which is giving out and ſecreting horn, and whoſe ulceration will be attended with other phænomena than occur in the ulceration of fleſhy, or other parts of the animal ſtructure, and this peculiarity will render a different treatment neceſſary.

The following is a ſtatement of the treatment of a ſucceſsful caſe of this diſorder, with ſome obſervations as the caſe proceeds.

A black draft horſe that had been under the care of a ſhoeing-ſmith about nine or ten months to be cured, without ſucceſs, was put under our care in a truly deplorable condition. The ſole and frog were almoſt one extended ſurface of diſeaſe, ſecreting a white curdy fluid, which was poured out in great abundance about the ſides of the frog: this fluid was probably formed of the union of lymph, and the veſſels throwing out imperfect horn which became partially diſſolved in it; the ſame appears to be ſecreted in running thruſh, and if allowed to remain long on the part, becomes highly fetid.

The edges of the horn encircling the ſore were found to be detached, undermined, and black within; theſe were every where removed by thinning away the horn with a ſharp drawing knife, and when pared ſo thin and ſoft that the drawing knife would no longer lay hold of it, a lancet blade made rather ſtronger than thoſe uſually are for bleeding, and ſtuck in a handle, was uſed for thinning away the remaining part, and to diſſect ſmall bits of horn in ſituations where the drawing knife would not conveniently reach. This tedious proceſs was purſued on every ſide of the ſore which was found to extend to the wall of the foot, and took up a conſiderable time, the effuſion of the leaſt blood being cautiouſly avoided, as this would flow over and obſcure the parts to be cut. The foot was then ſmeared over with egyptiac, or the cupreous acetite, and honey, boiled together, though we found it equally, or ſuperiorly efficacious for this purpoſe when made of blue vitriol and treacle, at a much leſs expence, which may be acceptable information to thoſe who may have to uſe a large quantity of it: over this dreſſing, pledgets of tow dipped in tar and plentifully ſoaked with it are laid, till they cover it to a conſiderable depth. A hollow ſhoe having been previouſly tacked on by a few nails, an iron plate is paſſed under it, and this is faſtened in by iron ſplents between it and the ſhoe, and driven moderately tight with a hammer: ſimilar dreſſings are applied to the heels and ſides of the foot if requiſite, and then bound on tight by tar cords. Theſe dreſſings require to be removed every 48 hours, or when the diſeaſe is very virulent, every day: if on removing the dreſſings they appear tolerably free from moiſture, it is a favourable ſign. If the foot reeks, and the dreſſings appear drenched with perſpiration, little or no permanent horn will be found to have formed; if, on the contrary, the parts are doing well, the ulcer will appear almoſt dry, with a brown ſcale of horn formed upon its ſurface, which will generally ſhell off of itſelf, if not removed, and is beſt removed, and this for ſeveral ſucceſſive times, till the parts acquire the requiſite ſtrength for ſupporting the horn that is formed, which ſhould however be kept as thin as poſſible for a conſiderable time, that it may not irritate and exfoliate again. The ſurface that was undermined, and from whence the horn had been recently removed, will be found the next day to have ſwelled very much into a ſort of more healthy fungus, and on the ſurface of which, horn will begin to form; this being removed, another layer beneath this takes place, and ſo on till it reaches the natural foot. By this curious proceſs nature ſeems to acquire room, and avoids that compreſſion which the immediate formation of horn on the ulcer would occaſion. The parts of the ſore that were ſubject to irritation may be known by the thin diſcharge, and the riſing ſoft bleeding fungus; and the points of horn irritating them muſt be carefully removed to a conſiderable diſtance.

The firſt horn that forms, eſpecially of the ſole and frog, readily peels off, and exhibits underneath ſmall white fibres, by which it adhered; the ſecond coat is more firmly attached; and in recent caſes where the powers of the foot are not weakened, will adhere and become perfect horn; but in old caſes, it is requiſite often to remove it, or thin it down with the knife, and to keep it ſoft and pliant with tar dreſſings to prevent irritation and exfoliation.

Some, inſtead of egyptiac, apply dry powdered verdigreaſe to the ſore; others, butter of antimony; and ſome touch the ſurface with lunar cauſtic; others, again, uſe dilute nitrous acid, or marine acid; and ſome are fond of red lead boiled down, and mixed with the egyptiac, as making it more drying: theſe irritating meaſures, though of good effect at firſt, may be carried too far, and do miſchief, and weaken the parts too much: it is of more conſequence to carefully remove all external irritation from the ſurrounding horn, and the employing of uniform, regular, and ſtrong, but not exceſſive preſſure, which, if aſſiduouſly followed with the milder application of tar, are equal to the cure of moſt caſes, except ſuch as from long diſeaſe have become ſo deſtroyed and weak, as not to be capable of forming, or afterwards holding horn upon them, or, as is ſometimes the caſe, that the coffin-bone has been injured, and an exfoliating portion of it keeps up the ſore, in ſpite of every endeavour to heal it, till this is removed, as we have met with in two inſtances. This injury of the coffin-bone may ariſe from a nail driven by accident out of its courſe into the ſide of the foot, and which, entering the bone, ſplinters and deſtroys a portion of it; or from the remedies uſed being of a too corroſive nature, or too violent preſſure, that ſhall have deſtroyed the ſurface of it, which dying, acts as an extraneous body in preventing the parts from healing; or the horſe, from ſtamping violently on the unprotected bone, from pain or otherwiſe, ſhall fracture its thin edges, and thus keeping up an irritation which ſhall defy every attempt of cure till theſe are removed, each of which we have ſeen caſes of in the courſe of our practice; we may juſt remark, that where there is an exfoliating portion, it is beſt to remove it as early as poſſible, without waiting the tedious proceſs of natural exfoliation: the wound thus formed being then of the nature of a freſh wound, will more readily heal, a practice, we believe, firſt recommended by that truly great character, Mr. John Hunter.

The above remedies alſo may be occaſionally changed for each other with advantage, as the long continued application of one thing occaſions it to loſe its effect; and one agrees beſt with one ſubject, another with another, for which there can be no rule laid down.

By purſuing the above means ſteadily and uniformly for about nine months, the above tedious and deſperate caſe was cured, and every part of the foot covered with horn: the horſe was then turned to graſs to encourage the more rapid growth of the horn. On his return from graſs he was put to work, but ſuddenly died in a few months after of a liver complaint, which afforded an opportunity we had much ſought for of examining the condition of the coffin-bone after a long exiſtence of this complaint upon it, and alſo whether nature would reſtore the loſt foliated ſubſtance of the hoof; and on examination, the foliated horn had been in a great meaſure repaired, and was growing down quite perfect; having covered two-thirds of the inſide of the hoof where the canker had exiſted, and where it terminated, there was ſeen a ſmooth ſort of cartilaginous ſurface on the inſide of the hoof, and a ſimilar one attached to the foot, ſo that theſe laid in contact with each other without *laminæ*.

The ſole which is leſs organized in its ſtructure than the wall of the hoof, had no perceptible difference from the original ſole. If the coronary ring and origin of the *laminæ* had been deſtroyed, we ſhould in that caſe doubt the poſſibility of their reproduction; for in this caſe, the coronary ring had been cautiouſly preſerved. The coffin-bone had ſuffered greatly by the diſeaſe being conſiderably diminiſhed on the ſide on which the ſore had exiſted, and was become very porous, rough, and uneven; on its upper part near the coronary ring, a rough elevation of bone had been thrown out, of the ſize of a pea, ſuch as is depoſited in ſplints and ſpavins, being whiter and of not ſo denſe a texture as the natural bone. The channel of the artery had alſo a thin white oſſeous depoſite running to the inſide of the heels of the coffin-bone, even where no ſore had exiſted.

In the courſe of the treatment of this diſeaſe in different ſubjects, we have had recourſe to many different meaſures for keeping on the dreſſings to the foot; among others for this purpoſe we had made a leather boot, laced on its ſides, with a wooden ſole, defended at bottom by a thin ring of iron; this boot afforded the requiſite preſſure, but kept the foot, as we found by experience, too hot and moiſt, ſo that the horn was no ſooner formed than it again exfoliated.

Flannel bandages were found to be ſubject to the ſame inconveniences. Shoes made with ſmall hooks to the ſides, paſſing the bands over the coronet, could not be applied for any length of time, from the ſkin of the coronet ulcerating from the preſſure: we found on the whole nothing ſurpaſs the application of pledgets of tow dipped in tar and tied round the foot, (when the ſides were affected) with tar. An iron clip turned up from the ſhoe and paſſing parallel to the hoof was alſo found convenient when the ſore was not extenſive.

The laſt point is generally by far the moſt difficult to heal on the ſide of the foot; it will be found in general to be about oppoſite the circular artery of the coffin-bone, or its foramen: in the ſole the moſt difficult point is the heel, and the junction of the ſides of the frog with the ſole: to get at theſe moſt conveniently, tow rolled up pretty tight between the hands, then immerſed in the dreſſing, and thruſt into the cavity, will be found a convenient way of getting at it; another roll being laid over this, and another till we arrive at the level of the ſole, when a general pledget is applied over the whole.

At other times we thought it more convenient and advantageous, in ſole caſes, to paſs the iron plate under the ſhoe, and then ram it full by puſhing in the dreſſings through the openings of the heels.

If there be much moiſture in the dreſſings, the caſe rarely goes on well. The plentiful uſe of tar ſeems to have the power of ſuppreſſing, in ſome manner, this tranſudation, and cannot be too much attended to, as it ſerves alſo to keep the wet from it, if the horſe be uſed on the road.

A dry looſe place is better in the cure of this complaint for the horſe, than ſtanding conſtantly in one poſition in a ſtall, where eſpecially if it be in the hind legs, the blood accumulates with too much force from the declivity of the ſtall, their poſition being much lower than the reſt of the body.

Exerciſe, if the lameneſs is not ſo great as to forbid it, is much to be recommended, and the occaſional uſe of phyſic, eſpecially where the horſes ſtand ſtill; a rowel alſo may be had recourſe to with advantage, eſpecially if there be any diſpoſition to greaſe.

The frog, we have thought, appeared to be weaker in its powers of forming horn than the ſole, and this than the wall; and the firſt horn is more apt to be undermined and exfoliate from this part, though it may appear fair to the eye: cells containing a white ſemifluid matter alſo ariſe under it and that of the ſole, and are often the attendant of theſe exfoliations.

The cooler the foot can be kept, the more progreſs is made in the cure; therefore, much dreſſing or much covering is not ſo well, and water, though highly prejudicial, if applied for a conſtancy, yet may be uſed to waſh the foot with, and afterwards being well wiped dry, the dreſſings are applied, as we have thought, with good effect. In ſome caſes, where the fungus riſes higher than the horn, and it may be an object to ſave the horn, it will be better to attack the fungus by carefully paring it with a knife till blood appears, and then uſe the deſiccatives and preſſure; at any rate by this means, leſs of the horn need be removed, as we get at it cloſer to the fungus than in the other caſe; and it is always of conſequence where it can be done, to ſave all the horn poſſible, on account of its ſlow growth.

In diſſecting away the offending points of horn, we have found it uſeful to obſerve the rule of beginning in the moſt depending parts of the foot, that if the blood ſtarts, it ſhall not obſcure the parts you are next to come to, as it would do if you commenced differently. If inadvertently a veſſel is opened that is troubleſome, it is moſt readily ſtopped by the point of the cautery, without affecting the other part.

A kind of canker that is truly difficult of cure is the following.—A large draft horſe that had occaſionally been dreſſed by the ſmiths for more than a twelvemonth, had a canker of the near hind foot, with the following appearances: the frog was large and fleſhy, with a ſmooth red ſurface that would form a hard ſhell of horn, looſely attached and quickly exfoliating; the ſole every where bare of horn, having threads or fibres of conſiderable length, and hardened only at their extremity, their roots being inundated with a white milky ſecretion. After endeavouring ineffectually to harden theſe into horn, we cut them cloſe off with a pair of ſciſſars, and found that we made more progreſs upon the diſorder: the parts, however, were ſo weak, that they appeared unable to retain the horn they had formed, and after ſeveral exfoliations of this ſort, finding that little ground had been made, from the vicious diſpoſition of the animal, probably made ſo by the long pain he had been expoſed to, and the time it conſumed as well as the aſſiſtance it required, we determined to abandon the caſe. Two or three of ſuch caſes have we ſeen, out of about twenty, ſome of which have been eaſily cured in a few weeks.

Having given ſome account of the diſeaſe itſelf, it will now be right to conſider what is its cauſe, and if it can be prevented, for we fully concur in the words of Vegetius: (lib. 2. c. 58.) "preſtantius concilium eſt pedum tueri ſanitatem quam paſſionem curare;" preventive means are certainly the moſt wiſe, and after ſuch a deſcription of this diſorder, there is no one, we ſhould apprehend, that would not be anxious to avert it. We conſider the moſt prevailing cauſe of this complaint to be the running thruſh, which firſt only affects the cleft of the frog, but becoming aggravated, it gradually undermines the horn of the frog and ſpreads to its ſides, and from thence to the ſole, and ſo on to the wall and whole foot.

We remember one caſe where it appeared brought on by the greaſe, the diſcharge from which running down upon the frog, at length deſtroyed the horn, and brought on canker. Shaving the frog too cloſe with the buttreſs would occaſion this part to dry and crack, and wet getting into the cracks, and lodging there, would rot the frog and induce canker. Any wound of the frog or ſole not healing kindly at firſt by the blood, ſuch as a kennel nail wound, or any other deſcription of wound, becoming irritated by the ſurrounding horn, would form a canker; however, theſe are rare caſes compared with the one we have mentioned, viz. the running thruſh, the common ſource of the miſchief, which is certainly a conſequence of the frog being ſqueezed together by the contraction of the heels, and this again ariſes from the nailing of an iron ſhoe permanently to the foot, for an account of which, ſee articles, Foot *of the horſe*, and Farriery.

Such is the "brief chronicle" of our preſent experience in this diſeaſe, which, though avowedly imperfect, will ſerve as a more ſure baſis for receiving the facts of future labourers than the hitherto almoſt uſeleſs accounts of this terrible diſorder.

Canker is alſo a diſeaſe in dogs, which ſeizes their ears.

Canker, in hawks, breeds in the throat and tongue, occaſioned by foul feeding. It is cured by waſhing the mouth with honey and white wine boiled together, then ſtrewing it with chervil-powder.

Canker, *black*, in *Entomology* and *Huſbandry*, a ſpecies of caterpillar, which has been occaſionally deſtructive, in a very great degree, to the crops of turnips in Norfolk. The farmers in that county, obſerving great numbers of yellow flies among the turnips, previouſly to the appearance of theſe caterpillars, have been led to conclude, that the canker was the caterpillar ſtate of the yellow fly; and from their frequent appearance on the eaſtern ſea-coaſt it has been inferred, that they are not natives of this country, but that they come hither acroſs the ocean. Their deſtructive ravages, however, have not been confined within a few miles of the eaſtern coaſt; but they have extended more or leſs into the centre of the county. From the deſcription which Mr. Marſhall has given of them, it appears that they have four wings; that their antennæ are clubbed, and about one-third the length of the body, each being compoſed of nine joints; and that near the point of the tail of the female there is a black ſpeck outwardly fringed with hair, but which, opening longitudinally, appears to be the end of a caſe containing a ſting, about one-twentieth of an inch in length, which, on agitation, ſeparates into three one-edged inſtruments, with a ſpiral line or wrinkle winding from the points to the baſe, making ten or twelve revolutions, and giving them the appearance of being ſerrated. By means of theſe inſtruments, the female is ſuppoſed to depoſite her eggs in the edge of the turnip leaf, or ſometimes in the nerves or ribs on its under ſurface. The caterpillar has twenty feet (ſix of its legs being conſiderably long, and the other fourteen very ſhort); and in its firſt ſtage is of a jet black, deſtitute of hair, but covered with innumerable wrinkles. Having attained its full ſize, it fixes its hinder parts firmly to the leaf of a turnip, or other ſubſtance, and breaking its outer coat or ſlough near the head, crawls out, leaving the ſkin fixed to the leaf, &c. The under coat, which now appears, is of a bluiſh or lead colour. The caterpillar in this ſtate continues to feed on the turnips for ſome days longer; it then altogether deſiſts from eating, and becomes covered with a dewy moiſture which ſeems to exude from it in great abundance, and which, being of a glutinous nature, appears to form its chryſalis coat. Mr. Marſhall concludes from the genuine characters of the fly, that it is *tenthredo* of Hill. See Tenthredo and Turnip. Phil. Tranſ. vol. 73. p. 227, &c.

CANNA, in *Botany*, (Heb. קנה Kane, a reed, whence our Engliſh word Cane is indiſputably derived. Καννα is interpreted in the Greek Lexicons ψιαθος, a mat, or according to Heſychius, the plant of which mats are made. It is larger than arundo and leſs than calamus,) Linn. Gen. 1. Schreb. 1. Willd. 1. Gært. 41. Juſſ. 63. Vent. vol. 2. 203. (Cannacorus, Tourn. 192.) Indian flowering reed, or Indian ſhot. Baliſier, Fr. Claſs and order, *monandria monogynia*. Nat. Ord. *ſcitamineæ*, Linn. *cannæ*, Juſſ. *drymyrrhizæ*, Vent.

Gen. Ch. *Cal.* Perianth three-leaved, permanent; leaves lanceolate, erect. *Cor.* Monopetalous, ſix-cleft (eight-cleft; Saliſb.) three outer ſegments erect, larger than the calyx; three inner ſegments larger than the outer ones, two erect, one revolute, forming a kind of lip. *Stam.* Filament reſembling a petal, two-cleft; upper ſegment erect, bearing the anther; lower one revolute; anther linear, adhering to the edge of the upper ſegment of the filament. *Piſt.* Germ inferior, roundiſh, ſcabrous; ſtyle ſword-ſhaped, reſembling a petal, united at its baſe to the filament; ſtigma linear, adhering to the edge of the ſtyle. *Peric.* Capſule roundiſh-egg-ſhaped, crowned with the calyx, ſcabrous, three-furrowed, three-celled, three-valved; cells many-ſeeded. *Seeds* globular, affixed to a central receptacle.

Eſſ. Ch. Calyx three-leaved, corolla ſix-cleft, filament two-cleft; one ſegment revolute, ſtyle united at its baſe to the filament, capſule crowned with the calyx.

Obſerv. What is called the filament by Linnæus, Juſſieu, Ventenat, and La Marck, is conſidered by Schreber as a nectary, and by Saliſbury as conſtituting two other ſegments of the corolla.

Sp. 1. C. *indica*, Linn. Sp. 1. Gært. tab. 12. fig. 3. La Marck Illuſt. Pl. 1. Bot. Mag. 454. (Cannacorus, Rumph. Amb. 5. tab. 71. fig. 2. Katu-Bala; Rheed. Mal. 11. p. 85. tab. 43. Arundo indica latifolia, Bauh. pin. 19.) β Cannacorus ampliſſimo fol. flore rutilo; Tourn. Inſt. 367. γ C. *coccinea*, Hort. Kew. γ C. flore coccineo ſplendente, Tourn. Inſt. 367. δ C. *lutea*, Hort. Kew. β Cannacorus fl. luteo punctato, Tourn. Inſt. 367. Riv. tab. 112. "Leaves egg-ſhaped, acuminate at both ends, nerved." Linn. "Leaves broad-lanceolate, ſmooth beneath; ſegments of the corolla revolute, nearly linear; inner ones leſs." Saliſbury prod. *Root* thick, fleſhy, horizontal, divided into many irregular knobs. *Root-leaves* egg-ſhaped, a foot long, and five inches long in the middle, with many large, tranſverſe veins, prominent on the under ſide, running from the midrib to the ſides; and between each of them two ſmaller, parallel, pointed veins. *Stems* three or four feet high, ſimple, upright, herbaceous. *Stem-leaves* alternate, large, broad, egg-ſhaped, acuminate, ſheathings ſmooth. *Flowers* red, in an upright, terminal, rather looſe ſpike; almoſt ſeſſile, growing alternately, two or three together in the axil of a ſhort, ſpathaceous ſcale. A native of warm climates in Aſia, Africa, and America. Its leaves are uſed to cover houſes in Cayenne. Its root is regarded as diuretic and deterſive. Its ſeeds dye a beautiful but not durable purple. 2. C. *anguſtifolia*, Linn. Sp. Pl. "Leaves lanceolate, petioled, nerved." Perhaps only a variety of the preceding ſpecies, but lower and narrower; and one of the lateral ſegments of the petal is ſo bent as to become the middle one. A native of ſpongy ſhady places within the tropics. 3. C. *glauca*, Linn. Sp. Pl. (cannacorus glaucophyllus: Dill. Elth. tab. 59. fig. 69.) "Leaves lanceolate, petioled, nerveleſs." Linn. "Leaves narrow-lanceolate, even on both ſides; ſegments of the corolla ſpreading, inverſely egg-ſhaped; inner ones leſs." Saliſb. *Roots* large, ſtriking ſtrong fleſhy fibres deep into the ground. *Stems* ſeven or eight feet high. *Leaves* near two feet long, narrow, ſmooth, of a glaucous colour. *Flowers* large, pale yellow, in ſhort thick terminal ſpikes. *Seed-veſſels* larger and longer than in the preceding ſpecies, with fewer and larger ſeeds. Cultivated at Eltham by Dr. Sherard in 1732. Raiſed by Mr. Miller in 1733 from ſeeds ſent from Carthagena in New Spain, which produced ſtrong plants the firſt year, ſome of them flowering the ſame autumn. 4. C. *flaccida*. Saliſb. Prod. p. 4. Icon. ſtirp. rar. 3. (C. glauca β, Willd.) "Leaves narrow-lanceolate, even on both ſides: ſegments of the corolla flaccid, inverſely egg-ſhaped: inner ones larger." A foot and half high or more, (four feet, Mart.) reſembling C. glauca. *Root* horizontal, tuberous; fibres white, thick, fleſhy. *Stems* ſeveral, pale ſea-green, upright, ſimple, round, jointed, ſmooth, herbaceous, nearly, if not entirely, covered by the ſheathing petioles. *Leaves* from five to ſeven, pale ſea-green, alternate, ſhorter than the petioles or ſheaths, ſpreading, entire, with a very thin membranous edge, pointed at the end, very finely nerved, a little channelled above, keeled beneath, eſpecially towards the baſe. *Flowers* from one to three, pale yellow, ſcentleſs, rather nodding: bractes two under each germ, blunt, entire, permanent; the outer one preſſed cloſe to the germ, the inner one longer and narrower, often ſpreading and incurved: calyx-leaves unequal, entire, obtuſe: tube of the corolla much longer than the calyx, a little recurved; outer border a little longer than the tube, abruptly reflexed, deeply three-cleft; ſegments unequal, linear-lanceolate, entire, obtuſe, thicker; inner border longer than the outer one, deeply five-cleft, ſegments tender, flaccid, much curled at the edges, the outer ones narrow, and nearly cloſed, the inner ones (ſegments of the filament, Linn. &c.) broader, inverſely egg-ſhaped, emarginated; anther white, adhering to the edge of the inner ſide of the inmoſt ſegment, upright, linear, very minutely pointed, two-celled, opening in front; germ pale-green, oval, minutely tubercled: ſtyle very pale yellow, linear-ſpatula-ſhaped, ſmooth on both ſides, flat; ſtigma white, ſlightly pubeſcent. *Pericarp* and *ſeeds* ſimilar to thoſe of the other ſpecies. Saliſbury. A native of South Carolina, where it was found by Bartram. It is often miſtaken for C. glauca. 5. C. *juncea*, Willd. Retz Obſ. faſc. 1. p. 9. 2. 1. "Leaves linear, nerved." *Leaves* graſs-like, with five raiſed nerves, ſheathing at the baſe; thoſe near the root covered with capillary fibres, from ſeven inches to a foot long. *Flowers* of a duſky rufous colour. *Pericarp* rough, with pointed tubercles. Retz. A native of China.

*Propagation and Culture.* All the ſpecies are perennial, and with proper management will continue many years: but as young plants always flower better than old roots, it is beſt to raiſe them annually from ſeeds which ſhould be ſown in a hot-bed in the ſpring. When the plants are fit to remove, they ſhould be tranſplanted into ſeparate ſmall pots, filled with rich kitchen garden earth, and plunged into a moderate hot-bed of tanners-bark. In warm weather they ſhould be ſupplied with freſh air every day and frequently watered. As they ſoon grow large, they ſhould be ſhifted into larger pots, and part of them plunged into the ſame hot-bed; the reſt may be placed abroad in June in a warm ſituation with other exotic plants. Thoſe which are placed in the hot-bed will be ſtrong enough to flower well in the ſtove in the following winter: but thoſe in the open air will not flower before the following ſummer. In the beginning of October, they muſt be removed into the ſtove. The variety β of C. indica, which is a native of Carolina and ſome of the other northern ſtates of America, being hardier, ſhould be more early enured to the open air, where it may remain till the froſt begins. It ſhould be then removed to the green houſe, and during the winter ſhould have but little water. In the beginning of May it may be turned out of the pot, and planted in a dry ſoil on a warm ſouth border, where it will produce flowers annually. Miller.

Canna, in *Commerce*. See Cane.

Canna, in *Ancient Geography*, a ſmall town of Aſia Minor, in the Eolide. Mela.—Alſo, a town of Cappadocia, in Lycia. Ptolemy.—Alſo, a place of Aſia, between Cyrra and Edeſſa. Anton. Itin.

CANNABA, a place of Aſia, in Syria, upon the route from Nicopolis to Edeſſa. Anton. Itin.

CANNABICH, in *Biography*, a ſpirited and maſterly compoſer of ſymphonies, of the Manheim ſchool, contemporary with Stamitz and Holtzbaut, about the middle of the laſt century. He was the moſt eminent ſolo player on the violin of his time: and his ballet of the deſcent of Hercules into the infernal regions, is a moſt beautiful production.

CANNABINA, in *Botany*, (folio tripartitim diviſo. C. Bauh. pin. 321.) See BIDENS TRIPARTITA.

CANNABINA, (folio non diviſo, ibid.) See B. CERNUA.

CANNABINA, (indica. Magn. Hort. 40. tab. 40.) See VERESINBA ALATA.

CANNABINA, Tourn. Cor. 52. tab. 488.) See DATISCA CANNABINA.

CANNABIS, (κανναβις, Herod. Dioſcor. It is not mentioned by Theophraſtus.) Linn. gen. 1115. Schreb. 1522. Gært. 463. tab. 75. fig. 1. Tourn. Inſt. 535. tab. 309. Juſſ. 404. Vent. vol. iii. 536. Claſs and Order, *diæcia pentandria*. Nat. Ord. *Scabridæ*, Linn. *Urticæ*, Juſſ.

Gen. Ch. Male. *Cal.* perianth five-cleft; ſegment oblong, acuminately obtuſe, concave. *Cor.* none. *Stam.* filaments five, capillary, very ſhort; anthers oblong, four-cornered. Female. *Cal.* perianth one-leafed, oblong, acuminate, opening longitudinally on one ſide, permanent. *Cor.* none. *Piſt.* germ very ſmall; ſtyles two, very long; ſtigmas acute. *Peric.* the permanent calyx cloſely covering the ſeed. *Seed*, nut globular, depreſſed, two-valved.

Eſſ. Ch. Male. Calyx five-cleft; corolla none. Female. Calyx one-leafed, entire, opening on one ſide; corolla none; ſtyles two; nut two-valved, within the cloſed calyx.

Sp. 1. C. *ſativa*, Linn. Sp. Pl. Mil. fig. tab. 77. Bauh. Hiſt. i. fig. 448. Ger. Emac. 708. fig. 1, 2. Lam. Ill. Pl. 814. Hemp. Chanvre, Fr. "Leaves oppoſite." *Root* annual. *Stem* from ſix to eight feet high or more, upright, obſcurely quadrangular, a little hairy. *Leaves* petioled, digitate; leaflets five or ſeven, lanceolate, acuminate, ſerrated, outer ones the ſmalleſt. *Male flowers* in ſmall looſe racemes or ſpikes at the ends of the ſtem and branches. *Female flowers*, axillary, ſolitary, very ſmall. Both kinds ſometimes occur on the ſame plant, but always one of them very few in proportion to the other. All the old authors ignorantly call the male flowers female, and vice verſa. It is ſaid by Herodotus to be a native of Scythia. According to Linnæus it grows wild in the Eaſt Indies. Thunberg ſays it grows here and there in Japan. Gmelin found it in Tartary, and Father Hennepin among the Illinois, in North America. From long cultivation it is almoſt naturalized in the ſouth of France, Italy, &c. An oil is extracted from its ſeeds. The ſeeds themſelves are thought to be good for poultry, and to cauſe hens to lay a larger quantity of eggs, but ſhould be given to ſmaller birds with caution, and mingled with other ſeeds. It has been ſaid, that if bullfinches and goldfinches feed upon them too plentifully, the red and yellow of their plumage is changed to a total blackneſs. For the propagation and culture of this plant, the various proceſſes which it undergoes in the hands of the manufacturer, and the uſes to which it is applied, ſee HEMP. 2. C. *indica*, Lam. Encyc. (C. ſimilis exotica, Bauh. pin. 320. C. peregrina, Moriſ. Hiſt. iii. p. 433. n. 2. Kalengi-Cansjava, Rheed. Mal. 10. p. 119. tab. 60. Tsjern-Cansjava, Ibid. tab. 61. Dakka or Bangua of the Indians. *β*. With a taller ſtem. Rumph. Amb. v. p. 208. tab. 77. "Leaves alternate." *Stem* nearly cylindrical, ſmaller, more branched, and harder than that of the preceding ſpecies. *Leaves* all conſtantly alternate; leaflets linear-lanceolate, very ſharp-pointed; in the male plants five or ſeven, in the female ones commonly but three, on a petiole; near the top entirely ſimple. A native of the Eaſt Indies. Its hard ſtem and thin bark render it incapable of being wrought into filaments and ſpun like common hemp. It has a ſtrong ſmell, a little like that of tobacco. The Indians make of its bark and the expreſſed juice of its leaves and ſeeds, a liquor which has an intoxicating quality; and if they wiſh to produce a ſtronger effect, they either chew or ſmoke its dried leaves mingled with tobacco. A little nutmeg, cloves, camphor, and opium, mixed with its juice, form the compoſition which the Indians call *majeh*, and which, according to Cluſius, is the ſame as the malach of the Turks.

CANNABIS *Spuria*, (Riv, Mon. tab. 32.) See GALEOPSIS VERSICOLOR.

CANNABIS *Virginiana*, (Bauh. Pin. 320.) foliis ſimplicibus, (Gron. Virg. 192. 155*.) See ACNIDA CANNABINA.

CANNABIS *lutea fertilis*, (Alp. Exot. 300. tab. 298. Moriſ. Hiſt. tab. 25. fig. 4. lutea cretica et ſterilis, Alp. Exot. 296. tab. 295, and 301. tab. 300.) See DATISCA CANNABINA.

CANNACORUS. See CANNA.

CANNÆ, the ſecond order of the fourth claſs of the natural orders of Juſſieu, with the following character. *Calyx* (corolla, Linn.) ſuperior, coloured; divided into ſeveral, often ſix, petal-ſhaped, generally unequal and irregular ſegments; with three others exterior and ſmaller, putting on the appearance of an external calyx, (the proper calyx, Linn.) *Stamen* one; filament inſerted into the baſe of the ſtyle, often flat and petal-ſhaped; anther adhering, ſimple, or rarely double. *Germ* inferior; ſtyle ſimple, often thread-ſhaped; ſtigma ſimple or divided. *Capſule* inferior, three-celled, moſt frequently three-valved, and many-ſeeded. *Root* often tuberous, creeping. *Stem* herbaceous, covered with the ſheathing petioles. *Leaves* alternate, ſheathing, younger ones convolute, ſome many-nerved, others ſending out parallel nerves from each ſide of a ſimple midrib. *Flowers* in ſpathes, often growing on a cauline, or radical ſpadix. The genera aſſigned to this order by Juſſieu are catimbium, canna, globba, myroſma, amomum, coſtus, alpinia, maranta, thalia, curcuma, and kæmpferia.

CANNÆ, in *Ancient Geography*, a ſmall town of Italy, in Apulia, ſeated on the river Aufidus, now called Ofanto. The Latins uſe the plural appellation for this city, probably from its conſiſting of diſtinct parts, built on different eminences. The Greeks, and Polybius in particular, called it Καννη, in the ſingular number. This place has been rendered famous in hiſtory by the battle fought in its vicinity between the Carthaginians and the Romans, in the year of Rome, 538, B. C. 216. For ſome time previous to this battle, Hannibal, the Carthaginian general, had, by various movements and ſkirmiſhes, endeavoured to bring Fabius, the wiſe and wary Roman dictator, to a deciſive conteſt. He well knew that inaction and delay were the principal evils he had to fear, and the diſtreſs occaſioned by want of proviſions and money made him anxious to provoke the Romans to an engagement. Fabius, on the other hand, duly apprized of the ſituation of his adverſary, adopted every prudent meaſure for protracting the war, and ruining his enemy by delay. Some trivial ſucceſſes which were gained by the Romans in their encounters with the Carthaginians, increaſed the confidence both of the army and of the people: and forgetting their former defeats, they began to imagine that the enemy maintained his ſtation in Italy, by the permiſſion, by the timidity, or by the exceſſive caution of their leader. Minutius, the general of the horſe, having alſo, in the abſence of the dictator, obtained ſome ſlight advantage over the foraging parties of Hannibal, the army and the people were confirmed in this opinion, and the reputation of Fabius was greatly ſunk in their eſtimation. But as he could not be ſuperſeded till the uſual term of his office expired, the ſenate and people adopted a meaſure, which they hoped would induce him to reſign. They raiſed the general of the horſe to an equal command with the dictator, and left them to adjuſt their reſpective pretenſions. The Roman dictator, inſtead of raſhly and indignantly withdrawing his ſervices in a moment of danger, continued to ſerve under this diminution of rank and command, and magnanimouſly overlooked the inſults with which the people had requited the ſervice he was rendering to his country. Minutius being now aſſociated with the dictator, in order to be free from the reſtraints of a joint command, and from the wary counſels of his colleague, deſired, as the moſt proper mode of adjuſting their pretenſions, to divide the army between them. In this new ſituation he expoſed himſelf and his diviſion, by his raſhneſs, to the danger of being entirely cut off by the enemy; but being reſcued by Fabius, he acknowledged the favour he had received, and committing himſelf, with the whole army, to the conduct of his colleague, he left this cautious officer, during the remaining period of their joint command, to purſue the plan which he had formed for the war, and to which, without overbearing interference, he determined to adhere. The people, and the ſenate, however, were not diſpoſed to acquieſce in what they conceived to be the languid and dilatory meaſures which Fabius was inclined to purſue. Having reſolved to augment the army in Italy to eight legions; which, with an equal number of the allies, amounted to 80,000 foot and 7200 horſe, which they conceived would be a force more than ſufficient to counteract that of the Carthaginians, which conſiſted of 40,000 foot, and 10,000 horſe; they intended, on occaſion of the approaching election of conſuls, to chuſe men, not only of reputed ability, but of deciſive and reſolute counſels. Accordingly, they elected C. Terentius Varro, ſuppoſed to be of a bold and dauntleſs ſpirit; and, with a view of tempering his ardour, they joined with him in the command L. Æmilius Paulus, an officer of approved experience, who had formerly obtained a triumph for his victories in Illyricum, and who ſtood high in the confidence of the ſenate, as well as in that of the people.

The autumn before the nomination of theſe officers to the command of the Roman army, Hannibal had ſurpriſed the fortreſs of Cannæ, whither the Roman citizens of that quarter had retired with their effects, and where they had collected conſiderable magazines and ſtores. This, among other circumſtances, determined the ſenate to hazard a battle, and to furniſh the new conſuls with inſtructions to this effect. Theſe officers, having opened the campaign on the banks of the Aufidus, advanced by mutual conſent within ſix miles of the Carthaginian camp, which covered the town of Cannæ. Here they differed in their opinions; and a compromiſe was made by an agreement, that each of them ſhould alternately take the command for a day. Varro, in oppoſition to the ſentiments of his colleague, propoſed to give battle on the plain, and for this purpoſe, as often as the command devolved upon him, ſtill advanced on the enemy. In order to occupy the paſſage and both ſides of the Aufidus, he encamped in two ſeparate diviſions on its oppoſite banks, having his larger diviſion on the right of the river, oppoſed to Hannibal's camp. Still taking the opportunity of his turn to command the army, he paſſes with the larger diviſion to a plain, ſuppoſed to be on the left of the Aufidus, where, as the field was too confined to receive the legions in their uſual form, he preſſed them together, and gave the enemy, if he choſe it, an opportunity to engage. For the accommodation of his order to the extent of his ground, he contracted the head, and the intervals of his manipules or columns, making their depth greatly to exceed the front which they turned to the enemy. He placed his cavalry on the flanks, the Roman knights on his right towards the river, and the horſemen of the allies on the left. Varro, having thus arranged his force, and impelled by vanity, in conſequence of having obtained ſome ſlight advantages by ſkirmiſhes between the light horſe, or exaſperated by an inſult of the Numidians, who had purſued a body of Romans almoſt to the gates of the camp, determined to bring the conteſt to a ſpeedy concluſion. Paulus Æmilius diſapproved of the place which he had choſen for the ſcene of battle, but wiſhed to draw the enemy to a ſituation, where the infantry, in the number of which they exceeded, might have the greater ſhare in the action, whereas Hannibal's cavalry was in every reſpect ſuperior to that of the Romans; and remonſtrated againſt the precipitance of his colleague. Paulus Æmilius commanded the right of the Romans, Varro the left, and Servilius Geminus, the conſul of the preceding year, was in the centre. Hannibal, as ſoon as he ſaw the movement and diſpoſition of the enemy, haſtened to meet them on the plain which they had choſen for the field of action. He likewiſe paſſed the Aufidus, and with his left to the river and his front to the ſouth, formed his army upon an equal line with that of the enemy. He placed the Gauliſh and Spaniſh cavalry on his left facing the Roman knights, and the Numidians on his right facing the allies. The flanks of his infantry, on the right and the left, were compoſed of the African foot, armed in the Roman manner, with the pilum, the heavy buckler, and the ſtabbing ſword. His centre, though oppoſed to the ſelect portion of the Roman legions, conſiſted of the Gauliſh and the Spaniſh foot, variouſly armed and intermixed together. Aſdrubal commanded the left, Hanno the right, and Hannibal with his brother reſerved the command of the centre to himſelf. As the armies fronted north and ſouth, even the ſun, which roſe ſoon after they were formed, ſhone upon the flanks, and was no diſadvantage to either of them. Some difficulty has occurred in deciding which way each of theſe armies was turned; as the expreſſions of Polybius are ſaid by ſome to admit of a double meaning. His words are "*Βλεπȣσης δὲ της μεν των Ρωμαίων τάξεως πρὸς μεσημβρίαν τῆς δὲ τῶν Καρχηδονίων πρὸς τας ἄρκτȣς· ἑκατέροις ἀβλαπῆ συνέβαινε γινεσθαι τὴν κατὰ τὸν ἥλιον ανατολην.* Spectante meridiem Romanorum acie, Carthaginienſium verò ſeptentrionem, ambobus inoffenſis contigit eſſe ab ſolis ortu. Livy is charged by Chaupy with having miſinterpreted the paſſage of the Greek hiſtorian, who, according to his opinion, did not mean, that the Romans ſtood with their faces to the noon-tide ſun; but only that they were drawn up to the ſouth of the enemy. Livy's words are (lib. xxii. 46.) "Romanis in meridiem, Pænis in ſeptentrionem verſis." He affirms, moreover, that the topography of the plain, and the courſe of the river, agree with this explanation; and that if the legions had faced the ſouth, the runaways could not, after the defeat, have reached Canuſium and Venuſia, without paſſing through the whole victorious army. Salapia, Arpi, and Luceria, would have been their places of refuge. Swinburne inclines to truſt to the explanation of Livy, who was ſufficiently acquainted with the Greek language not to miſtake the meaning of an author whom he ſtudied and followed ſo cloſely; more eſpecially as, according to his ideas, the ſituation of the ground is in favour of the Roman hiſtorian; for exactly in that part of the plain where we know with moral certainty that the main effort of the battle lay, the Aufidus, after running due eaſt for ſome time, makes a ſudden turn to the ſouth, and deſcribes a very large ſemicircle. The Romans, we are to ſuppoſe, forded it at the angle or elbow, and placed their right wing on the banks; while the legions extended themſelves due eaſt, till the whole line came to face the ſouth. The Carthaginians croſſed in two places within the ſemicircle; and were drawn out in a line, that formed the chord of which the river was the arch; and therefore the way to Canuſium was open for the fugitives. Swinburne adds, that the ſcene of action is marked out to poſterity by the name of "Pezzo di Sangue," or field of blood. The peaſants, he ſays, ſhewed us ſome ſpurs and heads of lances lately turned up by the plough, and told us, that horſe-loads of armour and weapons had been at different times carried away from thence. Livy (l. xxii. 13.) and Plutarch (in Fab. p. 183.) inform us, that Hannibal, who knew how to avail himſelf of circumſtances, as a great captain, forgot nothing that could conduce to the victory. A wind peculiar to that region, called in the country the "Vulturnus," blew always at a certain period. He took care to draw up in ſuch a manner, that his army, facing the north, had it in their backs, and the enemy, fronting the ſouth, had it in their faces; ſo that he was not in the leaſt incommoded by it: whereas the Romans, whoſe eyes it filled with duſt, ſcarcely ſaw before them. The ſuperiority of numbers was greatly on the ſide of the Romans; but Hannibal reſted his hopes of victory on two circumſtances: firſt, on a motion to be made by his cavalry, if they prevailed on either of the enemy's wings; next, on a poſition he was to take with his centre, in order to begin the action from thence, to bring the Roman legions into ſome diſorder, and expoſe them, under that diſadvantage, to the attack which he was prepared to make with his veterans on both their flanks. The action accordingly began with a charge of the Gauliſh and Spaniſh horſe, who, being ſuperior to the Roman knights, drove them from their ground, forced them into the river, and put the greater part of them to the ſword. By this event the flank of the Roman army, which might have been joined to the Aufidus, was entirely uncovered. Having performed this ſervice, the victorious cavalry had orders to wheel at full gallop round the rear of their own army, and to join the Numidian horſe on their right, who were ſtill engaged with the Roman allies. By this unexpected junction, the left wing of the Roman army was likewiſe put to flight, and purſued by the African horſe; at the ſame time the Spaniſh cavalry prepared to attack the Roman infantry, wherever they ſhould be ordered on the flank, or the rear. While theſe important events took place on the wings, Hannibal amuſed the Roman legions of the main body with a ſingular movement that was made by the Gauls and Spaniards, and with which he propoſed to begin the action. Theſe came forward, not in a ſtraight line a-breaſt, but ſwelling out to a curve in the centre, without disjoining their flanks from the African infantry, who remained firm on their ground. By this motion, they formed a kind of creſcent convex to the front. The Roman manipules of the right and the left, fearing by this ſingular diſpoſition to have no ſhare in the action, haſtened to bend their line into a correſponding curve; and, in proportion as they came to cloſe with the enemy, charged them with a confident and impetuous courage. The Gauls and Spaniards reſiſted this charge no longer than was neceſſary to weaken the precipitant ardour with which victorious troops often blindly purſue a flying enemy. And the Roman line being bent, and fronting inwards to the centre of its concave, the legions purſued where the enemy led them. Hurrying from the flanks to ſhare in the victory, they narrowed their ſpace as they advanced, and the men who were accuſtomed to have a ſquare of ſix feet clear for wielding their arms, being now preſſed together, ſo as entirely to prevent the uſe of their ſwords, found themſelves ſtruggling againſt each other for ſpace, in an inextricable and hopeleſs confuſion. Hannibal, who had waited for this event, ordered a general charge of his cavalry on the rear of the Roman legions, and at the ſame time an attack from his African infantry on both their flanks: by theſe diſpoſitions and joint operations, without any conſiderable loſs to himſelf, he effected an almoſt incredible ſlaughter of his enemies. With the loſs of no more than 4000 Gauls, 1500 Spaniards and Africans, and 200 horſes, he put 50,000 of the Romans to the ſword. Polybius ſays the general loſs amounted to more than 70,000. The Carthaginians were ſo furious againſt the enemy that they did not ceaſe killing till Hannibal, in the greateſt heat of the conflict and ſlaughter, exclaimed ſeveral times, "Hold, ſoldiers, ſpare the vanquiſhed." The conſul Æmilius Paulus had been wounded in the ſhock of the cavalry; but when he ſaw the condition in which the infantry were engaged, he refuſed to be carried off, and was ſlain. "I have taken my reſolution," ſaid he. "I will expire upon theſe heaps of my dead ſoldiers: but do you take care not to loſe the time you have for eſcaping from the enemy, through an uſeleſs compaſſion. Go, and tell the ſenate from me to fortify Rome, and to make troops to enter it for its defence, before the victor arrives to attack it. Tell Fabius in particular, that I lived and died highly ſenſible and fully convinced of the wiſdom of his counſels." The conſuls of the preceding year, with others of the ſame rank, were likewiſe killed: of 6000 horſe only 70 troopers eſcaped with Varro. Of the infantry, 3000, or according to other accounts, 4000, fled from the carnage that took place on the field of battle, and 10,000, who had been poſted to guard the camp, were taken; others retired to Canuſium.

The unfortunate conſul with ſuch of the ſtragglers as joined him in his retreat, took poſt at Venuſia, and afterwards at Canuſium, where he joined a conſiderable number of thoſe that had eſcaped; and with a noble confidence in his own integrity, and in the reſources of his country, put himſelf in a poſture to reſiſt the enemy, till he obtained further inſtructions and reinforcements from Rome. On his return to the city, the ſenate, conſcious that he had acted at Cannæ by their own inſtructions, and, that influenced by the motives that animated the whole Roman people, he had diſdained, with a ſuperior army, to ſtand in awe of his enemy, or to refuſe him battle upon equal ground, went out in a kind of proceſſion to meet him; and overlooking his temerity and miſconduct in the action, they attended only to the undaunted aſpect which he preſerved after his defeat, and returned him thanks for not having deſpaired of the commonwealth. From this time they continued their preparations for war with all the dignity and pride of the moſt proſperous fortune. They refuſed to ranſom the priſoners who had been taken by the enemy at Cannæ, and treated with ſullen contempt, rather than ſeverity, thoſe who by an early flight had eſcaped from the field; and when they were petitioned to employ them again in the war, they replied, "we have no ſervice for men who could leave their fellow-citizens engaged with an enemy." On the part of Hannibal, this victory was complete; but his ſubſequent inactivity ſaved Rome and her dominions. Many, and Livy amongſt the reſt, condemn Hannibal for his delay in properly improving this ſignal ſucceſs, as a capital error. But others, reſtrained by the authority, or rather the ſilence of Polybius, have forborne from cenſuring the conduct of the Carthaginian general. He allows, indeed, that the Carthaginians entertained hopes of carrying Rome on the firſt aſſault; but he does not explicitly declare his own opinion concerning the meaſures which might have been proſecuted in reſpect to a city very populous, extremely warlike, well fortified, and defended by a garriſon of two legions. He does not ſo much as intimate that ſuch a project was practicable, or that Hannibal was to be blamed for not having attempted it. It ſhould be conſidered, that after the battle he had not more than 26 or 27 thouſand foot, who were in a condition to act; and that number could not ſuffice either for forming the circumvallation of a city of ſuch extent as Rome, with a river running through it, or for attacking it in form, without machines and other implements neceſſary in a ſiege. The victory at Cannæ afforded to Hannibal a very conſiderable booty: but except men, horſes, and a little ſilver which was principally upon the furniture of the horſes, he abandoned all the reſt to the ſoldiers. After the battle of Cannæ, Hannibal took up his winter quarters at Capua, which ſee. Polybius, iii. 262-267-298. Livy, xxii. 43-44-54. Plut. in Fab. 182-184. Rollin's Anc. Hiſt. vol. i. Rollin's Rom. Hiſt. vol. iii.

The plains on which the battle of Cannæ was fought, have more than once, ſince the Punic war, afforded a ſcene of warfare and blood. Melo of Bari, after raiſing the ſtandard of revolt againſt the Greek emperors, and defeating their generals in ſeveral engagements, was at laſt routed here, in 1019, by the catapan Bolanus. Out of 250 Norman adventures, the flower of Melo's army, no more than ten eſcaped the ſlaughter of the day. In 1201, the archbiſhop of Palermo and his rebellious aſſociates, who had taken advantage of the nonage of Frederick of Swabia, were cut to pieces at Cannæ by Walter de Brienne, ſent by the pope to defend the young king's dominions. The remaining traces of the town of Cannæ are very faint; and conſiſt of fragments of altars, cornices, gates, walls, vaults, and underground granaries. It was deſtroyed, as we have already obſerved, the year before the battle; but being rebuilt, it became an epiſcopal ſee in the infancy of Chriſtianity. It was again reduced in the 6th century; but ſeems to have ſubſiſted in an humble ſtate many ages later; for we read of its contending with Barletta for the territory which till that time had been enjoyed in common by them: and in 1284, Charles the firſt iſſued an edict for dividing the lands to prevent all future litigation. The proſperity of the towns along the coaſt, which increaſed in wealth and population by embarkations for the cruſades, and by traffick, accelerated the annihilation of the inland cities; and Cannæ was probably abandoned entirely before the end of the 13th century. It is now an inconſiderable place, with a titular ſee, in the country of Bari. Swinburne's Travels, &c. vol. i.

CANNAGARA, a town of India, placed by Ptolemy on the other ſide of the Ganges.

CANNAR, or Cannatum, a promontory of Africa, in the Mediterranean Sea, in Mauritania Tingitana, according to the Itinerary of Antonine.

CANNARES, Indians of the province of Quito, in Peru. They are well made and very active; they wear their hair long, which they weave and bind about their heads, in form of a crown. Their clothes are made of wool or cotton, and they wear fine-faſhioned boots. Their women are handſome and fond of the Spaniards; they generally till and manure the ground, whilſt their huſbands at home card, ſpin, and weave wool and cotton. Their country had many rich gold mines, which have been drained by the Spaniards. The land bears good wheat and barley, and has fine vineyards. The magnificent palace of "Theomabamba" was ſituated in the country of the Canares.

CANNAVAROLA, in *Ornithology*, the name aſſigned by Aldrovandus to the babbling warbler, Motacilla Curruca of Linnæus.

CANNAVERAL, Cape, in *Geography*, the extreme point of rocks on the eaſt ſide of the peninſula of Eaſt Florida, having the Moſquitos inlet N. by W. and a large ſhoal S. by E. This was the boundary of Carolina by charter of Charles II. N. lat. 28° 35'. W. long. 81° 9'.

CANNAYAH, a village of the north ſide of Waſhington iſland, on the N.W. coaſt of North America.

CANNEL-Coal. See Coal.

CANNELÉ, in *Zoology*, a ſpecies of biped reptiles in the arrangement of De la Cepede, in the firſt volume of his "Hiſtory of oviparous Quadrupeds and Serpents." The other ſpecies of this genus is the ſheltopuſik, deſcribed by Pallas in the Peterſburgh Tranſactions.

The cannelé is an animal lately diſcovered in Mexico by M. Vélaſques, and brought into France by the viſcounteſs de Fontanges. Its whole length is 8½ inches, and its diameter the third of an inch; the abdominal ſemi-rings are 150, and the tail-rings 31; the thickneſs of the whole body is nearly equal; the legs, one-third of an inch long, are cloſe to the neck, and the feet have each four toes furniſhed with nails. The cannelé ſeems to have a near reſemblance to the amphiſbæna of Linnæus, and perhaps, when it is better known, it may be found to belong to that genus; though, at the ſame time, the legs juſtify the genus as eſtabliſhed by the count De la Cepede.

CANNEQUINS, in *Commerce*, white cotton cloths brought from the Eaſt Indies. They are a proper commodity for trading on the coaſt of Guinea, particularly about the rivers Senegal and Gambia. Theſe cloths are folded ſquare-wiſe, and are about eight ells long.

CANNES, in *Geography*, a ſmall town and harbour of France in the department of the Var, and diſtrict of Graſſe, which gives name to a bay formed by Cape Garaup or Garoupe. N. lat. 43° 34'. E. long. 7° 7'.

CANNESIS, a town of Louiſiana, on the north bank of Red River, a branch of the Miſſiſippi.

CANNETE, a town of Spain, in the province of Cordova; 18 miles E. of Cordova.—Alſo, a town of Spain, in the province of Seville; 5 leagues S. of Oſſuna.

CANNETS, Fr. in *Heraldry*, ducks repreſented without beaks or feet. Cannets have their heads in profile, and they differ from *Allerions*, which are always diſplayed and full-faced, and they have longer and more encircling necks than thoſe of the martlets.

CANNETTE, in *Geography*. See Cagnete.

CANNIA, a place in the iſland of Ceylon, about ſix miles from the fort of Trincomalee on the road to Candy, famous for its ſprings, the waters of which are reckoned very efficacious in rheumatic complaints. The ſprings are ſix in number, and of different degrees of heat; they all communicate with one another, and exhibit the ſame phenomena. Their heat varies from 98° to 106½° of Fahrenheit's thermometer, nearly in proportion to their different depths. From an analyſis of theſe waters it appears that they poſſeſs few mineral qualities, or perhaps any virtue beſides their heat, which is of a temperature not unfavourable for hot bathing. Percival's Ceylon, p. 360.

CANNIBAL, or Canibal, is uſed by modern writers for an *anthropophagus*, or man-eater, more eſpecially of the Weſt Indies. See Anthropophagi.

In the ancient world, tradition has preſerved the memory of barbarous nations of cannibals, who fed on human fleſh, and in every part of the new world there were people to whom this cuſtom was familiar. It prevailed in the ſouthern continent in ſeveral of the iſlands (See Caribbees), and in various diſtricts of North America. Even in ſome parts where the practice has been aboliſhed, it ſeems formerly to have been ſo well known, that it is incorporated into the idiom of their language. Among the Iroquois, the phraſe by which they expreſs their reſolution of making war againſt an enemy is "Let us go and eat that nation." If they ſolicit the aid of a neighbouring tribe, they invite it to eat broth made of the fleſh of their enemies." Nor was this practice peculiar to rude unpoliſhed tribes: the principle from which it took riſe is ſo deeply rooted in the minds of the Americans, that it ſubſiſted in Mexico, one of the civilized empires of the new world, and relics of it may be diſcovered among the more mild inhabitants of Peru. It was not ſcarcity of food, as ſome authors imagine, and the importunate cravings of hunger, which forced the Americans to theſe horrid repaſts on their fellow-creatures. Human fleſh was never uſed as common food in any country. It was the rancour of revenge that firſt prompted men to this barbarous action. The fierceſt tribes ſeldom devoured any but priſoners taken in war, or ſuch as they regarded as enemies.

This fact is confirmed by two remarkable circumſtances, which occurred in the conqueſt of different provinces. In the expedition of Narvaez into Florida, in 1528, the Spaniards were reduced to ſuch extreme diſtreſs by famine, that in order to preſerve their own lives, they ate ſuch of their companions as happened to die; this appeared ſo ſhocking to the natives, who were accuſtomed to devour none but priſoners, that it filled them with horror and indignation againſt the Spaniards. During the ſiege of Mexico alſo, though the Mexicans devoured with greedineſs the Spaniards and Tlaſcalans, whom they took priſoners, the utmoſt rigour of the famine which they ſuffered could not induce them to touch the dead bodies of their own countrymen. The authorities for theſe facts are cited in Dr. Robertſon's Hiſt. of America, vol. ii. p. 501. See Anthropophagi. See alſo the articles America, Ansiko, Batta, Surinam, and New Zealand.

CANNOCK, or Cannot-*ſtone*, a baſe ſort of iron-ore, in the Staffordſhire mines, of which the worſt metal is made.

CANNON, in French *canon*, from the Italian word *cannone*, which is derivable from the Greek word κανὼν, ſignifying the beam of a ſteelyard or balance, a reed, cane, rod, or ruler, &c.; or from κάννα, in Latin *canna*, a cane, reed, ſugar-cane, pipe, &c. This word, in its general acceptation, is applied not only to large guns, howitzers, mortars, carronades, &c. and all heavy pieces of ordnance or artillery, but alſo to the barrels of all ſmaller ſized fire-arms, ſuch as muſkets, carabines, fuſees, piſtols, &c. whether the bores of the ſame be ſmooth on the inſide or rifled. In its more reſtricted and ordinary acceptation, however, it is made uſe of to expreſs a large-ſized fire-arm, a piece of ordnance or artillery, a warlike engine, machine, or inſtrument for projecting or throwing balls, bullets, ſhells, grape-ſhot, ſtones, &c. &c. by means of gunpowder. It has a cylindrical bore or tube running lengthwiſe in the middle of it from the muzzle towards the breech for receiving the charges of powder, ſhot, ſhells, &c. After gunpowder began to be applied to military purpoſes, it ſupplanted and ſucceeded the *tormenta bellica*, or warlike machines of the ancients. The firſt cannons were called *bombardæ*, from βομβος or "a bombo et ardore," on account of the great noiſe, which the firing of them occaſioned; and as they ſucceeded to theſe machines, they were employed like them for throwing large ſtones, and had prodigious calibers. Their forms, as well as the engines and inſtruments made uſe of for managing, moving, and conducting them, were only ſuch as the moſt obvious incidents ſuggeſted, or the rudeſt and moſt uncultivated invention dictated. They uſually conſiſted of bars or pieces of iron fitted, and ſometimes ſoldered together lengthwiſe, and hooped with iron rings. Being long beyond all juſt or due proportion; they were heavy, clumſy, and in a great degree unmanageable; and as they were uſed for throwing ſtones, like the machines they ſucceeded, they were neceſſarily of a huge or enormous bore, and could not be fired but at great intervals of time. Such were thoſe with which we are told Mahomet II. battered the walls of Conſtantinople in the year 1453, being ſome of them of the caliber of no leſs than 1200 pounds. Though ſome uſe had been made of guns in Europe upwards of a century before, ſo little improvement had been made in their conſtruction that they could not be fired above three or four times a day or diſcharged often without burſting. And Guicciardin, in the firſt book of his hiſtory, informs us, that ſo great a portion of time intervened between the different chargings and diſchargings of one of thoſe ponderous and unwieldy pieces, that the beſieged had ſufficient time to repair at their leiſure the breaches made in their walls by the ſhock of the huge and enormous ſtones, that were thrown from them. For a conſiderable time, indeed, after men began to apply gunpowder to military purpoſes, their guns were very long, heavy, and unmanageable, and of courſe very unfit for quick or expeditious ſervice. Military people at that time poſſeſſed but a ſmall ſhare of learning of any kind, and almoſt none at all of a mechanical or mathematical nature. What they did profeſſionally in regard to the management of artillery was entirely the effect of practice and a bare repetition of what they ſaw every day done.

But as mathematical knowledge increaſed in Europe, that of mechanics gradually advanced, and enabled artiſts by making both braſs and iron cannon of a much ſmaller bore for receiving iron bullets, and a much greater charge of ſtrong powder in proportion to their calibers, to produce a very material and important change in the conſtruction and fabric of thoſe original pieces. Accordingly this hiſtorian, in the ſame book of his hiſtory, informs us, that about 114 years after the firſt uſe made of thoſe ponderous and unwieldy pieces by the Venetians, in the war which they carried on againſt the Genoeſe in the year 1380, the French were able to procure for the invaſion of Italy a great number of braſs cannon, mounted on carriages, drawn by horſes inſtead of oxen; and that theſe pieces could always keep pace with the army.

In enumerating the advantages, which aroſe from this alteration in the ſtructure and management of artillery, he obſerves, that the pieces were pointed with incredible quickneſs and expedition in compariſon of thoſe formerly made uſe of in Italy, were fired at very ſmall intervals of time, and could produce in a few hours an effect, which thoſe others could not have produced in the ſpace of many days. In ſpeaking of theſe matters he uſes the following words.

"Et per unerſi con queſto eſercito erano ſtate condotte per mare a Genoua quantità grande d'artiglierie da battere le muraglie et da uſare in campagna, ma di tal ſorte, giammai non havava veduta Italia le ſemighanti. Queſta peſte trovata molt' anni innanzi in Germania fu condotta la prima volta in Italia da Venetiani nella guerra, che circa l'anno della ſalute 1380 hebbono i Genoueſi con loro—Il nome delle maggiori era bombarde, le quali, ſparſa dopo queſta inventione per tutta Italia s'adoperavano nell' oppugnationi delle terre, alcune di ferro, alcune di bronzo ma groſſiſſime, in modo che per la machina grande et per l'imperitia de gli huomini et mala attitudine de gl' inſtrumenti tardiſſimamente et con grandiſſima difficulta ſi conducevano, piantavanſi alle terre co' medeſimi impedimenti et piantate era dall' un colpo all' altro tanto intervallo, che con peccoliſſimo frutto, a comparatione di quello, che ſegnito dopo molto tempo conſumavano, donde i defenſori de luoghi oppugnati havevano ſpatio di potere otioſamente fare di dentro ripari et fortificationi. Ma i Franceſi fabricando pezzi molto più eſpediti, nè d'altro che di bronzo, i quali chiamavano cannoni, et uſando palle di ferro, dove prima di pietra et ſenza comparatione piu groſſe et di peſo graviſſimo s'uſavano li conducevano in ſulle cerette tirate (non da buoi come in Italia ſi coſtumava) ma da cavalli con agilita tale d'huomini et d'inſtrumento deputati a quello ſervigio, che quaſi ſempre al pari de gli eſerciti caminavano, et condotte alle muraglie erano piantate con preſtezza incredibile, et interponendoſi dall' un colpo all' altro piccoliſſimo intervallo di tempo ſi ſpeſſo et con impeto ſi gaghardo percuotevano, che quello che prima in Italia fare in molti giorni ſi ſoleva do loro in pochiſſime hore ſi faceva."

Theſe pieces uſed generally to throw iron-balls from forty to ſixty pounds in weight; and this change in the formation of artillery has not as yet undergone many material alterations. Lighter guns indeed are now employed than thoſe, that were made uſe of at firſt; but they have ſuffered greater variations in reſpect of ſize than proportion.

When, or by whom, guns were firſt invented is uncertain, ſince the origin both of them and of gun-powder is involved in obſcurity; though it is highly probable, that mixtures or compoſitions ſimilar to that of gun-powder were made ſoon after the diſcovery of ſalt-petre, becauſe it is difficult to conceive how the one diſcovery could exiſt long without the other.

The great increaſe of inflammability, which ſalt-petre gives to igneous or inflammable ſubſtances, when mixed with them, muſt ſoon after it was diſcovered itſelf have led to ſuch a mixture. For a ſmall part of it being either thrown or falling accidentally into any fire muſt have manifeſted this diſtinguiſhing quality in it and its prodigiouſly exploſive power when mixed with burning bodies, and have led to the idea of rendering inflammable materials violently and exceſſively more ſo than they are naturally, and powerfully exploſive, by mixing them with ſalt-petre. If the time could, therefore, be aſcertained when this ſubſtance firſt came to be made uſe of, conjectures might with ſome ſort of certainty, or at leaſt probability, be formed when mixtures like the compoſition of gunpowder were firſt made or invented. Such a diſcovery or invention, however, might long exiſt before a convenient and advantageous method of applying it to military projectiles might be thought of or ſuggeſted.

An opinion has generally prevailed, that ſalt-petre was firſt diſcovered either by the Arabians or the later Greeks, about the middle ages of the chriſtian æra, when alchemy and chemiſtry were much attended to and cultivated by both nations. It is even ſaid that the Arabic name for it is expreſſive of its exploſive quality. And if the Greek fire made uſe of by the later Greek emperors poſſeſſed this exploſive property, and produced the effects attributed to it, there muſt have been ſome ſalt-petre in its compoſition.

Whether ſalt-petre was known to the ancients, ſeems to be a matter of conſiderable uncertainty. They had, however, both in Europe and Aſia, their fiery tubes or cannæ, which, being loaded with ſtones, pitch, and iron balls, were exploded with a violent noiſe, much ſmoke, and great effect. And there are ſeveral paſſages, both in the Greek and Roman writers, which ſhew, that the Greek fire itſelf was uſed by both nations in their wars, and afford reaſons for tracing it back to a much earlier date than 660, or the ſea fight in the Helleſpont, commanded by Conſtantine Pogonates againſt the Saracens, and aſcribing the invention of it to Marcus Gracchus or Græcus.

The invention of gunpowder is uſually, though erroneouſly, aſcribed to one Bartholdus Schwartz, who is ſaid to have diſcovered it about the year 1320; and the Venetians are commonly ſuppoſed to have made the firſt application of it to military purpoſes in their war againſt the Genoeſe about the year 1380. Both of theſe ſuppoſitions, however, are certainly without foundation. For Roger Bacon, who lived almoſt fifty years before Schwartz, deſcribes a compoſition perfectly reſembling that of gunpowder; and unqueſtionable proofs can be produced of the uſe of artillery much earlier than the year 1380, even in Europe.

Bacon does not mention this compoſition as a new one, but ſpeaks of it as in common uſe for recreative fire-works, and only propoſes to apply a well known one to the deſtruction of armies by the violent effects of its flame unconfined. This is the firſt well-authenticated hint, that was given in Europe of the application of gunpowder to warlike purpoſes; though the Germans attempt to trace back the invention of cannon as far as 1250, and aſcribe it to Albertus Magnus, a Dominican monk.

That gunpowder, however, was both known and made uſe of long before the time, either of Roger Bacon, or Albertus Magnus, is a fact that cannot be denied. This is eſtabliſhed beyond even the poſſibility of diſpute by the treatiſe of Marcus Græcus, entitled "Liber ignium," which is in manuſcript in the Royal library at Paris. Doctor Mead had this treatiſe alſo in manuſcript, a copy of which is now in the poſſeſſion of the ingenious and learned Dr. Hutton. The author of it deſcribes ſeveral ways of encountering and oppoſing an enemy by launching fire on him, and among other things, gives the following directions. Mix together one pound of live ſulphur, two of charcoal of willow, and ſix of ſalt-petre, reducing them to a very fine powder in a marble mortar; then put a certain quantity of this mixture into a long, narrow and well compacted cover, and then diſcharge it into the air. This is exactly the deſcription of a rocket. He repreſents the cover, with which thunder is imitated as ſhort, thick, but half-filled, and ſtrongly bound with packthread, which is exactly the form of a cracker. He then delivers different methods for preparing the match, and explains how one ſquib may ſet fire to another in the air by having it incloſed within it. He deſcribes two kinds of fire-works, one for flying, and the other for making a loud report. He directs the caſe, *tunica*, or cartouche for the firſt to be made long and ſlender, and the compoſition to be very cloſely rammed; and the caſe for the ſecond to be thick and ſhort, and only about half filled. His compoſition for both is ſtronger than a great deal of gunpowder that is made now. It muſt, indeed, be acknowledged, that he treats as expreſly and diſtinctly of gunpowder and the effect of it, as any perſon writing on the ſubject, even at preſent poſſibly could do. He does not, however, ſpeak of ſuch compoſitions as uſed in war, which ſhews at leaſt, that they were known before the uſe of any ſort of fire-arms in thoſe parts of the world, he was acquainted with. And as he does not pretend to be the inventor of theſe rockets and crackers, or mention them as things new or recent, it may reaſonably be preſumed, that they were in uſe long before his time, which is not aſcertained to a certainty, though he muſt have lived as early at leaſt as the eighth century. We have reaſon alſo to conclude from the authorities of many authors, and a variety of concurrent and corroborating circumſtances, that gunpowder or compoſitions reſembling it, were known to the Chineſe and Indian nations, even thouſands of years ago. And it is alſo aſſerted by many modern travellers, that guns were made uſe of in China as far back as the year of Chriſt, 85, and that they have continued to be uſed there ever ſince. This aſſertion receives additional force and authority from the prohibition of fire-arms in the code of Gentoo laws, printed by the Eaſt India company in 1776. But there is reaſon to ſuppoſe that their fire-arms always were and have ever been in a very rude, imperfect, and inconvenient ſtate compared to thoſe that have been and are now uſed in Europe.

Though Bartholdus Schwartz has no claim whatever to the invention of gunpowder; it is alleged, and with great probability, that the ſimpleſt and moſt convenient method of applying it to military purpoſes in Europe, was firſt ſuggeſted to him, in 1320, by a ſpark of fire falling accidentally on a mixture of pounded nitre, ſulphur, and charcoal, in a mortar imperfectly covered with a ſtone, which was thrown by the exploſion to a conſiderable diſtance. The very figure and name of mortars given to a ſpecies of artillery, which are ſaid to have been made uſe of even before guns properly ſo called, and were employed at firſt for throwing large ſtones at conſiderable angles of elevation, render this conjecture probable.

Guns were ſoon after that incident employed in war. But mortars and great guns were firſt made uſe of.

Father Daniel in his life of Philip, of Valois, produces a proof from the records of the chamber of accounts at Paris, that cannon were uſed in the year 1338. And Du Cange finds mention made of them in Froiſſart, and other French hiſtorians ſome time earlier. In the liſt of aids raiſed for the redemption of John king of France, in 1368, mention is made of an officer in the French army under the denomination or appellation *of maſter of the king's cannon*, and of his providing four large cannons for the garriſon of Harfleur. There was one in the arſenal of Bamberg as early as 1323. The French uſed them in 1338, for the attack of ſome caſtles. But they did not certainly employ them in the field againſt their fellow creatures near ſo early as the Engliſh, who under Edward III., placed five of them, in 1346, on a ſmall hill near the village of Creſſy, which chiefly contributed to decide the celebrated battle of that name. From this circumſtance ſeveral of the French writers have laid claim to a greater degree of national humanity than they allow to the Engliſh. One of them, treating of cannon, expreſſes his ſentiments on the ſubject in the following words. "On ne faiſoit point encore uſage en France, en 1547, de cette arme terrible contre les hommes; les Francais s'en etoient bien ſervi, in 1338, pour l'attaque de quelques chateaux, mais ils rougiſſoient de l'employer contre leurs ſemblables. Les Anglais moins humains ſans doute nous devancerent et s'en ſervirent a la célèbre bataille de Creci, qui eut lieu entre les troupes du roi d'Angleterre Edouard III. qui fut ſi mechant, ſi perfide, qui donna tant de fil a retordre a Philippe de Valois, et aux troupes de ce dernier; et ce fut en majeure partie à la frayeur et à la confuſion, qu' occaſionnerent les canons dont les Anglais ſe ſervoient pour la premiere fois, et qu'ils avoient poſtés ſur une colline, proche le village de Creci, que les Français durent leur déroute." The Engliſh alſo made uſe of them the year following, viz. in 1347, at the ſiege of Calais.

It is generally believed that cannon have been made uſe of in Europe ever ſince the year 1338, and that they were employed for naval purpoſes on the Baltic ſea, in 1350. At any rate, it is certain that they were uſed by the Venetians, in 1366, at the ſiege of Claudia Jeſſa, now called Chioggia, and in their war with the Genoeſe in 1379 and 1380. Six years after this laſt-mentioned period the Engliſh carried cannon into England in two French veſſels, which they had captured.

Larrey aſcribes the invention of braſs cannon to J. Owen. He aſſerts that there were none ſuch known in England till the year 1535, and that iron-cannon were for the firſt time caſt in it in 1547. The Engliſh, however, did not manufacture many of theſe till towards the end of the 16th century.

Specimens of great guns, as they were firſt uſed, and before the caſting of them in founderies came into practice, are ſtill to be ſeen in many parts of Europe, and ſome of them in the tower, and the warren at Woolwich. Such an inſtrument or engine of war was firſt called *bombarde*, afterwards *cannon*, and now commonly goes by the name of a piece of ordnance or artillery. The word cannon, however, is ſtill applied to that part of every fire-arm great or ſmall, that receives the powder.

Cannon were formerly made of a very great length, which rendered them exceedingly heavy, and the uſe of them very limited and troubleſome. There were ſome of them employed by the Turks, in 1394, at the ſiege of Conſtantinople then in poſſeſſion of the Chriſtians, and alſo in 1452, which threw a weight of 100 lib.; but they could not ſtand repeated firing. Louis XII. had one caſt at Tours of the ſame ſize, that threw a ball from the Baſtile to Charenton. One of theſe extraordinary cannon was taken at the ſiege of Dien, in 1546, by Don John de Caſtro, and is now in the caſtle of St. Julian de Barra ten miles from Liſbon. The length of it is twenty feet ſeven inches; its diameter at the middle is ſix feet three inches; and it threw 100 lib. weight. It has neither dolphins, rings, nor a button; is of an unuſual kind of metal, and has a large Indoſtan inſcription on it, which ſays that it was caſt in 1400.

Formerly ſtrange and uncommon names were given to cannon. Thus Louis XII., in 1503, had twelve braſs cannon caſt of an extraordinary ſize called after the twelve peers of France. The Spaniards and Portugueſe named theirs after their ſaints. The emperor Charles V., when he went againſt Tunis, had twelve cannon founded, which he called the Twelve Apoſtles. At Milan there is a ſeventy pounder called the Pimontelli; and there is one at Bois-le-duc called the Devil. At Dover caſtle there is a ſixty pounder called Queen Elizabeth's pocket-piſtol. There is an eighty pounder in the tower of London brought thither from Edinburgh caſtle called Mounts-meg. There is alſo an eighty pounder in the royal arſenal at Berlin called the Thunderer, and one of the ſame caliber at Malaga called the Terrible. There are two curious ſixty pounders in the arſenal at Bremen called the Meſſengers of bad news. And laſtly there is an uncommon ſeventy pounder in the caſtle of St. Angelo at Rome, made of the nails that faſtened the copper plates which covered the ancient Pantheon, with this inſcription on it. "Ex clavis trabalibus porticus Agrippæ."

About the beginning of the 15th century, theſe uncommon names were moſtly laid aſide, and the following among other more general ones adopted.

| | | Pounders. | | Cwt. |
|---|---|---|---|---|
| Cannon royal or carthoun, | | 48 | about | 90 |
| Baſtard cannon or ¾ carthoun, | | 36 | | 70 |
| ½ carthoun, | | 24 | | 60 |
| Whole culverins, | | 18 | | 50 |
| Demi-culverins, | | 9 | | 30 |
| Falcon, | | 6 | | 25 |
| Saker | largeſt ſize, | 8 | | 18 |
| | ordinary, | 6 | | 15 |
| | loweſt ſort, | 5 | | 13 |

| | Pounders. | | Cwt. |
|---|---|---|---|
| Baſiliſk, - - - - - | 48 | about | [illegible] |
| Serpentine, - - - - - | 4 | - - | 8 |
| Aſpic, - - - - - - | 2 | - - | 7 |
| Dragon, - - - - - - | 6 | - - | 12 |
| Syren, - - - - - - | 60 | - - | 81 |
| Falconer, - - - - - - | 3, 2, and 1. | - | 15, 10, and 5. |
| Rabinet, - - - - - - - | 1 | | |
| Moyene, - - - - - - | 10 or 12 ounces. | | |
| &c. | &c. | | |

The French alſo had anciently the following pieces founded, ſeveral of which are to be found in France at this day.

| | Pounders. | lib. | Length. | |
|---|---|---|---|---|
| | | | ft. | in. |
| Baſilic, | 48 | 7200 | 10 | 0 |
| Dragon, | 40 | 7000 | 16 | 6 |
| Flying Dragon, | 32 | 7000 | 22 | 0 |
| Le Serpentin, | 24 | 4300 | 13 | 0 |
| La Coulevrine, | 20 | 7000 | 16 | 0 |
| Le Paſſemur, | 16 | 4200 | 18 | 0 |
| L'Aſpic, | 12 | 4250 | 11 | 0 |
| Le Peſſundeau, | 8 | 3500 | 15 | 0 |
| Le Pelican, | 6 | 2400 | 9 | 0 |
| La Demi coulevrine, | 10 | 3850 | 13 | 0 |
| Le Sacri, | 5 | 2850 | 13 | 0 |
| Le Sacret, | 4 | 2500 | 12 | 0 |
| Le Faucon, | 3 | 2300 | 8 | 0 |
| Le Fauconneau, | 2 | 1350 | 10 | 6 |
| Le Ribadequin, | 1 | 700 | 8 | 0 |
| Un autre Ribadequin, | ½ | 450 | 6 | 0 |
| L'Emerillon, | ¼ | 400 to 450 | 4to5 | |

At preſent cannon take their names from the weights of the balls, which they reſpectively diſcharge. Thus a piece that diſcharges a ball of 24 pounds, is called a 24 pounder; one that takes a ball of 12 pounds, is called a 12 pounder; and ſo of the reſt divided into the following ſorts.

Ship-guns, conſiſting of 42, 36, 24, 18, 12, 9, 6, and 3 pounders.

Garriſon guns, conſiſting of 42, 32, 24, 18, 12, 9, and 6 pounders.

Battering guns, conſiſting of 24, 18, and 12 pounders, and ſometimes though but ſeldom of 42 pounders.

Field pieces conſiſting of 12, 9, 6, 3, 2, 1½, 1, and ½ pounders.

Table of ſhip-guns ſettled in 1753.

| Braſs ſhip-guns. | | | | | | Iron ſhip-guns. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Caliber. | Length. | | Weight. | | | Caliber. | Length. | | Weight. | | |
| | ft. | in. | cwt. | qr. | lb. | | ft. | in. | cwt. | qr. | lb. |
| 42 | 9 | 6 | 61 | 2 | 10 | 42 | 10 | 0 | 55 | 1 | 10 |
| 32 | 9 | 5 | 55 | 2 | 7 | 32 | 9 | 6 | 53 | 3 | 23 |
| 24 | 9 | 5 | 51 | 1 | 12 | 24 | 9 | 5 | 48 | 0 | 0 |
| 18 | 9 | 0 | 48 | 1 | 0 | 18 | 9 | 0 | 41 | 1 | 8 |
| 12 | 9 | 0 | 29 | 0 | 0 | 12 | 9 | 0 | 32 | 3 | 3 |
| 9 | 8 | 5 | 26 | 0 | 0 | 9 | 8 | 5 | 23 | 2 | 2 |
| 6 | 8 | 0 | 19 | 0 | 0 | 6 | 7 | 0 | 17 | 1 | 14 |
| 3 | 6 | 5 | 11 | 0 | 0 | 4 | 6 | 0 | 12 | 2 | 13 |
| | | | | | | 3 | 4 | 6 | 7 | 1 | 7 |

Table of Garriſon Guns.

| Braſs garriſon guns. | | | | | | Iron garriſon guns. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Caliber. | Length. | | Weight. | | | Caliber. | Length. | | Weight. | | |
| | ft. | in. | cwt. | qr. | lib. | | ft. | in. | cwt. | qr. | lib. |
| 42 | 10 | 0 | 64 | 0 | 0 | 32 | 9 | 8 | 56 | 0 | 0 |
| 32 | 9 | 2 | 49 | 2 | 18 | 24 | 9 | 8 | 48 | 0 | 0 |
| 24 | 8 | 4 | 37 | 0 | 0 | 18 | 9 | 0 | 36 | 0 | 0 |
| 18 | 7 | 6 | 27 | 3 | 0 | 12 | 7 | 8 | 24 | [illegible] | [illegible] |
| 12 | 6 | 7 | 18 | 2 | 0 | 9 | 7 | 0 | 18 | 0 | 0 |
| 9 | 6 | 0 | 13 | 3 | 0 | 6 | 6 | 1 | 12 | 0 | 0 |
| 5 | 5 | 3 | 9 | 1 | 0 | 4 | 5 | 4 | 8 | 0 | 0 |

| Braſs battering pieces. | | | | | | Braſs field pieces. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| New pieces. | | | | | | New pieces. | | | | | |
| Caliber. | Length. | | Weight. | | | Caliber. | Length. | | Weight. | | |
| lib. | ft. | in. | cwt. | qr. | lib. | lib. | ft. | in | cwt. | qr. | lib |
| 24 | 9 | 8 | 27 | 0 | 0 | 12 | 5 | 0 | 8 | 3 | 8 |
| 18 | 9 | 0 | 20 | 1 | 0 | 6 | 4 | 6 | 4 | 3 | 10 |
| 12 | 7 | 8 | 13 | 2 | 0 | 3 | 3 | 6 | 2 | 3 | 10 |

The following dimenſions, &c. for all ſorts of braſs and iron cannon were eſtabliſhed by the Board of Ordnance in 1764.

BRASS CANNON.

| Nature. | Pounders. | Length. | | Weight. | | | Caliber of the gun. | Diameter of the ſhot. |
|---|---|---|---|---|---|---|---|---|
| | | ft. | in. | cwt. | qr. | lib. | in. hund. | in. hund. |
| Heavy. | 42 | 9 | 6 | 61 | 0 | 0 | 7.3 | 6.68 |
| | 24 | 9 | 6 | 52 | 0 | 0 | 5.83 | 5.54 |
| | 12 | 9 | 0 | 29 | 0 | 0 | 4.63 | 4.40 |
| | 9 | 9 | 0 | 26 | 0 | 0 | 4.21 | 4.0 |
| | 6 | 8 | 0 | 19 | 0 | 0 | 3.66 | 3.48 |
| | 3 | 7 | 0 | 11 | 2 | 0 | 2.91 | 2.77 |
| | 1½ | 6 | 0 | 5 | 2 | 0 | 2.31 | 2.2 |
| Medium. | 24 | 8 | 0 | 42 | 1 | 21 | 5.83 | 5.54 |
| | 12 | 6 | 6 | 21 | 0 | 14 | 4.63 | 4.40 |
| | 6 | 5 | 0 | 10 | 1 | 0 | 3.66 | 3.48 |
| Light. | 24 | 5 | 6 | 16 | 1 | 12 | 5.83 | 5.54 |
| | 12 | 5 | 0 | 8 | 3 | 18 | 4.63 | 4.40 |
| | 6 | 4 | 6 | 4 | 3 | 14 | 3.66 | 3.48 |
| | 3 | 3 | 6 | 2 | 3 | 4 | 2.91 | 2.77 |

### Iron Cannon.

| Nature. | Pounders. | Length. | | Weight. | | | Caliber of the gun. | Diameter of the ſhot. |
|---|---|---|---|---|---|---|---|---|
| | | ft. | in. | cwt. | qr. | lb. | in. hund. | in. hund. |
| | 42 | 9 | 6 | 65 | 0 | 0 | 7.3 | 6.68 |
| | 32 | 9 | 6 | 55 | 0 | 0 | 6.42 | 6.10 |
| Heavy. | 24 | 9 | 6 | 49 | 0 | 0 | 5.83 | 5.54 |
| Light. | 24 | 9 | 6 | 47 | 2 | 0 | 5.83 | 5.54 |
| | 18 | 9 | 0 | 40 | 0 | 0 | 5.29 | 5.03 |
| Heavy. | 12 | 9 | 0 | 32 | 2 | 0 | 4.63 | 4.40 |
| Medium. | 12 | 8 | 6 | 31 | 2 | 0 | 4.63 | 4.40 |
| Light. | 12 | 7 | 6 | 29 | 1 | 0 | 4.63 | 4.40 |
| | 9 | 9 | 0 | 29 | 0 | 0 | 4.21 | 4.00 |
| | 9 | 8 | 6 | 27 | 2 | 0 | 4.21 | 4.00 |
| | 9 | 8 | 0 | 26 | 2 | 0 | 4.21 | 4.00 |
| | 9 | 7 | 6 | 24 | 2 | 0 | 4.21 | 4.00 |
| | 9 | 7 | 0 | 23 | 0 | 0 | 4.21 | 4.00 |
| | 6 | 9 | 0 | 24 | 0 | 0 | 3.66 | 3.48 |
| | 6 | 8 | 6 | 23 | 0 | 0 | 3.66 | 3.48 |
| | 6 | 8 | 0 | 22 | 0 | 0 | 3.66 | 3.48 |
| | 6 | 7 | 6 | 20 | 2 | 0 | 3.66 | 3.48 |
| | 6 | 7 | 0 | 19 | 0 | 0 | 3.66 | 3.48 |
| | 6 | 6 | 6 | 18 | 0 | 0 | 3.66 | 3.48 |
| | 6 | 6 | 0 | 16 | 2 | 0 | 3.66 | 3.48 |
| | 4 | 6 | 0 | 12 | 1 | 0 | 3.21 | 3.04 |
| | 4 | 5 | 6 | 11 | 1 | 0 | 3.21 | 3.04 |
| | 3 | 4 | 6 | 7 | 1 | 0 | 2.91 | 2.77 |
| | ½ | 3 | 0 | 1 | 1 | 25 | 1.58 | 1.52 |

The following are the dimenſions, &c. eſtabliſhed by the Board of Ordnance in 1764 for braſs howitzers, which may be regarded as a ſort of ſhort cannon, mounted like guns on travelling carriages, and were much later in coming into uſe than either guns or mortars.

### Brass Howitzers.

| Nature. | Length. | | Weight. | | | Caliber of the howitzer. | Diameter of the ſhell. | Chamber contains powder. | |
|---|---|---|---|---|---|---|---|---|---|
| inches | ft. | in. | cwt. | qr. | lib | in. hund. | in. hund. | lib. | oz. |
| 8 | 3 | 1 | 11 | 0 | 0 | 8. 0 | 7.75 | 3 | 8 |
| 5 8 | 2 | 2 | 4 | 0 | 14 | 5.62 | 5.50 | 1 | 0 |
| 4.5 | 1 | 10 | 2 | 0 | 14 | 4.52 | 4.40 | 0 | 8 |

Mortars are alſo a kind of ſhort cannon of large bores, with chambers, and are made either of braſs or iron. The following are the dimenſions, &c. of all kinds of braſs mortars, whether for land or ſea ſervice, as eſtabliſhed by the Board of Ordnance in 1764.

### Brass Mortars.

| Natures. | Length. | | Weight. | | | Caliber of the mortar. | Diameter of the ſhell. | Chamber contains powder. | |
|---|---|---|---|---|---|---|---|---|---|
| inches | ft. | in. | cwt. | qr. | lib. | in. hund. | in. hund. | lib. | oz. |
| 13 Sea | 5 | 3 | 82 | 0 | 0 | 13.0 | 12.75 | 30 | 0 |
| 10 Sea | 4 | 9 | 33 | 0 | 0 | 10.0 | 9.75 | 12 | 8 |
| 13 Land | 3 | 8 | 25 | 0 | 0 | 13.0 | 12.75 | 10 | 0 |
| 10 Land | 2 | 9 | 11 | 0 | 0 | 10.0 | 9.75 | 3 | 12 |
| 8 Land | 2 | 2 | 4 | 0 | 0 | 8.0 | 7.75 | 2 | 0 |
| 5, 8 or royal. | 1 | 4 | 1 | 1 | 0 | 5.62 | 5.50 | 0 | 9 |
| 4, 5 or coehorn | 1 | 1½ | 0 | 3 | 0 | 4.52 | 4.40 | 0 | 5 |

The following table ſhews, at one view, the lengths and weights of our braſs cannon as they ſtand at preſent, with their reſpective calibers, or the diameters of their bores, the diameters of their ſhot, and of their ſhot gauges, the quantities of powder employed for proving them reſpectively, their reſpective charges for ſervice, for ſaluting with them, and for ſcaling them.

### BRASS GUNS OR CANNON.

| Nature. | Length. | | Weight. | | | Quantity of Powder uſed for | | | | | | | | Calibers or Diameters of the Bores. | Diameters of the Shot. | Diameters of the Shot Gauges. | Number of Calibers in the length of each. | Number of Diameters of the Shot in the length of each. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Proof. | | Service. | | Saluting. | | Scaling. | | | | | | |
| | ft. | in. | cwt. | qr. | lb | lb. | oz. | lb. | oz. | lb. | oz | lb. | oz. | inches | inches | | | |
| 42 Pounder Heavy | 9 | 6 | 66 | 0 | 0 | 31 | 8 | 14 | 0 | 10 | 8 | 3 | 4 | 7.018 | 6.684 | 6.795 | 16.244<br>or near 16¼ | 17.056<br>or near 17 |
| 32 Pounder Heavy | 10 | 0 | 55 | 0 | 0 | 26 | 12 | 10 | 11 | 8 | 0 | 2 | 12 | 6.410 | 6.105 | 6.207 | 18.721<br>or near 18.7 | 19.656. |
| 24 Pounder Heavy | 9 | 6 | 53 | 0 | 9 | 21 | 0 | 8 | 0 | 6 | 0 | 2 | 0 | 5.824 | 5.547 | 5.639 | 19.574<br>or near 19.6 | 20.552 |
| 24 Pounder Medium | 8 | 0 | 41 | 3 | 2 | 18 | 0 | 8 | 0 | 6 | 0 | 1 | 8 | 5.824 | 5.547 | 5.639 | 16.4835<br>or near 16½ | 17.307<br>or near 17⅓ |
| 24 Pounder Light | 5 | 6 | 16 | 3 | 13 | 10 | 0 | 5 | 0 | 5 | 0 | 1 | 0 | 5.824 | 5.547 | 5.639 | 11.3324<br>or near 11⅓ | 11.8983<br>or near 11.9 |
| 18 Pounder Heavy | 9 | 6 | 45 | 1 | 20 | 18 | 0 | 6 | 0 | 4 | 8 | 1 | 8 | 5.292 | 5.040 | 5.124 | 21.542<br>or near 21½ | 22.619<br>or near 22.6 |
| 12 Pounder Heavy | 9 | 0 | 31 | 2 | 8 | 12 | 0 | 4 | 0 | 3 | 0 | 1 | 0 | 4.623 | 4.403 | 4.476 | 23.3614<br>or near 23⅓ | 24.528<br>or near 24½ |
| 12 Pounder General Deſaguliers | 7 | 6 | 22 | 1 | 21 | 12 | 0 | 4 | 0 | 3 | 0 | 1 | 0 | 4.623 | 4.403 | 4.476 | 19.468<br>or near 19½ | 20.4406<br>or near 20.44 |
| 12 Pounder Medium | 6 | 6 | 21 | 3 | 0 | 9 | 0 | 3 | 8 | 3 | 0 | 0 | 12 | 4.623 | 4.403 | 4.476 | 16.872 | 17.715 |
| 12 Pounder Light | 5 | 0 | 8 | 3 | 4 | 6 | 0 | 3 | 0 | 3 | 0 | 0 | 8 | 4.623 | 4.403 | 4.476 | 12.9782<br>or near 13 | 13.627<br>or near 13⅔ |
| 6 Pounder Heavy | 8 | 0 | 19 | 1 | 6 | 6 | 0 | 2 | 0 | 2 | 0 | 0 | 8 | 3.668 | 3.498 | 3.552 | 26.172<br>or near 26⅙ | 27.444<br>or near $27\frac{4}{9}$ |
| 6 Pounder General Deſaguliers | 7 | 0 | 12 | 0 | 24 | 6 | 0 | 2 | 0 | 2 | 0 | 0 | 8 | 3.668 | 3.498 | 3.552 | 22.901<br>or near $22\frac{9}{10}$ | 24.0137<br>or near 24 |
| 6 Pounder Medium | 5 | 0 | 10 | 0 | 20 | 6 | 0 | 2 | 0 | 2 | 0 | 0 | 8 | 3.668 | 3.498 | 3.552 | 16.3577<br>or near 16⅓ | 16.7623<br>or near 16¾ |
| 6 Pounder Light | 4 | 6 | 5 | 0 | 18 | 3 | 0 | 1 | 8 | 1 | 8 | 0 | 4 | 3.668 | 3.498 | 3.552 | 14.722<br>or near 14¾ | 15.4374<br>or near $15\frac{3}{7}$ |
| 3 Pounder Heavy | 7 | 0 | 11 | 3 | 19 | 3 | 0 | 1 | 0 | 1 | 0 | 0 | 4 | 2.913 | 2.775 | 2.820 | 28.836 | 30.2702<br>or near 30¼ |
| 3 Pounder General Deſaguliers | 6 | 0 | 6 | 0 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 0 | 4 | 2.913 | 2.775 | 2.820 | 24.717 | 25.946<br>or near 26 |
| 3 Pounder Light | 3 | 0 | 1 | 3 | 16 | 1 | 8 | 0 | 8 | 0 | 8 | 0 | 2 | 2.913 | 2.775 | 2.820 | 12.3584<br>or near 12⅓ | 12.973<br>or near 13 |
| 1 Pounder Heavy | 5 | 0 | 2 | 2 | 12 | 1 | 0 | 0 | 6 | 0 | 6 | 0 | 1½ | 2.019 | 1.923 | 1.955 | 29.7181 | 31.2011<br>or near 31⅕ |

The following is a ſimilar table, for iron guns and carronades.

IRON GUNS and CARRONADES.

| Nature. | Length. | | Weight. | | | Powder for | | | | | | | | Calibers or Diameters of the Bores. | Diameter of the Shot. | Diameters of the Shot Gauges. | Number of the Calibers in the length of each Gun or Carronade. | Number of the Diameters of the Shot in the length of each Gun or Carronade. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Proof. | | Service. | | Saluting. | | Scaling. | | | | | | |
| | ft. | in. | cwt. | qr. | lb. | lb. | oz. | lb. | oz | lb. | oz. | lb. | oz | inches | inches | inches | | |
| 68 Pounder Carronades | 5 | 2 | 36 | 0 | 0 | 13 | 0 | 6 | 0 | 6 | 0 | 2 | 0 | 8.05 | 8.00 | | 7.7018 | 7.75 |
| 42 Pounder Gun | 10 | 0 | 67 | 0 | 0 | 25 | 0 | 14 | 0 | 10 | 8 | 3 | 4 | 7.018 | 6.684 | 6.795 | 17.099<br>or near 17 | 17.9333<br>or near 18 |
| 42 Pounder Carronades | 4 | 3½ | 22 | 1 | 0 | 9 | 0 | 4 | 8 | 4 | 8 | 1 | 8 | 6.85 | 6.684 | 6.795 | 7.5182 | 7.7049 |
| 32 Pounder Gun | 10 | 0 | 58 | 0 | 0 | 21 | 8 | 10 | 11 | 8 | 0 | 2 | 12 | 6.410 | 6.105 | 6.207 | 18.721 | 19.656 |
| 32 Pounder Carronade | 4 | 0¼ | 17 | 0 | 14 | 8 | 0 | 4 | 0 | 4 | 0 | 1 | 4 | 6.25 | 6.105 | 6.207 | 7.72 | 7.9033 |
| 24 Pounder Gun | 10 | 0 | 52 | 0 | 0 | 18 | 0 | 8 | 0 | 6 | 0 | 2 | 0 | 5.824 | 5.547 | 5.639 | 20.604 | 21.6338 |
| 24 Pounder Carronade | 3 | 7½ | 13 | 0 | 0 | 6 | 0 | 3 | 0 | 3 | 0 | 1 | 0 | 5.67 | 5.547 | 5.639 | 7.672 | 7.842 |
| 18 Pounder Gun | 9 | 6 | 42 | 0 | 0 | 15 | 0 | 6 | 0 | 4 | 8 | 1 | 8 | 5.292 | 5.040 | 5.124 | 21.542 | 22.619<br>or near 22.6 |
| 18 Pounder Carronade | 3 | 3 | 9 | 0 | 0 | 4 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 5.14 | 5.040 | 5.124 | 7.587 | 7.738 |
| 12 Pounder Gun | 9 | 6 | 34 | 0 | 0 | 12 | 0 | 4 | 0 | 3 | 0 | 1 | 0 | 4.623 | 4.403 | 4.476 | 24.6593 | 25.8914 |
| 12 Pounder Carronade | 2 | 2 | 5 | 3 | 10 | 3 | 0 | 1 | 8 | 1 | 8 | 0 | 12 | 4.50 | 4.403 | 4.476 | 5.7777 | 5.905 |
| 9 Pounder Gun | 9 | 6 | 30 | 1 | 0 | 9 | 0 | 3 | 0 | 2 | 4 | 0 | 12 | 4.200 | 4.000 | 4.066 | 27.095<br>or near 27 | 28.5<br>or 28½ |
| 6 Pounder Gun | 9 | 0 | 24 | 0 | 0 | 6 | 0 | 2 | 0 | 2 | 0 | 0 | 8 | 3.668 | 3.498 | 3.552 | 29.444<br>or 29⁴⁄₉ | 30.875 |
| 4 Pounder Gun | 6 | 0 | 12 | 1 | 0 | 4 | 0 | 1 | 5 | 1 | 5 | 0 | 6 | 3.204 | 3.053 | 3.104 | 22.47 | 23.583 |
| 3 Pounder Gun | 4 | 6 | 7 | 1 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 0 | 4 | 2.913 | 2.775 | 2.820 | 18.5376 | 19.459 |
| 2 Pounder Gun | 3 | 9 | 4 | 2 | 0 | 2 | 0 | 0 | 11 | 0 | 11 | 0 | 3 | 2.544 | 2.423 | 2.463 | 17.69 | 18.57 |
| 1 Pounder Gun | 3 | 0 | 2 | 2 | 0 | 1 | 0 | 0 | 6 | 0 | 6 | 0 | 1½ | 2.019 | 1.923 | 1.955 | 17.8 | 18.7 |
| ½ Pounder Gun | 3 | 0 | 1 | 2 | 0 | 0 | 8 | 0 | 3 | 0 | 3 | 0 | 1 | 1.602 | 1.526 | 1.551 | 22.471 | 23.59. |

The following is a ſimilar table for the lengths, weights, &c. of braſs mortars, which are pieces of artillery, and may be regarded as a ſpecies of ſhort cannon, uſed by us at preſent.

BRASS MORTARS.

| Nature. | Length. | | Weight. | | | Powder for Proof. | | Shells contain Powder. | | Weight of Shells empty. | Medium range at an Elevation of 45°. | Chambers contain Powder. | | | Powder for burſting Shells. | | | Powder for Scaling. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ft. | in. | cwt. | qr. | lb. | lb. | oz. | lb. | oz | lb. | yards. | lb. | oz. | gr. | lb. | oz. | gr. | lb. | oz. | gr. |
| 13 Inches Sea Service | 5 | 3 | 82 | 0 | 0 | 30 | 0 | 10 | 4 | 197 | 4100 | 32 | 0 | 0 | 6 | 12 | 0 | 1 | 4 | 0 |
| 13 Inches Land Service | 3 | 8 | 25 | 0 | 11 | 9 | 8 | 10 | 4 | 197 | 2100 | 9 | 1 | 8 | 6 | 12 | 0 | 0 | 8 | 0 |
| 10 Inches Sea Service | 4 | 8 | 33 | 0 | 0 | 12 | 8 | 4 | 5 | 93 | 3800 | 12 | 8 | 0 | 2 | 14 | 0 | 0 | 14 | 0 |
| 10 Inches Land Service | 2 | 9 | 10 | 2 | 0 | 3 | 14 | 4 | 5 | 93 | 1900 | 4 | 0 | 0 | 2 | 14 | 0 | 0 | 4 | 0 |
| 8 Inches Land Service | 2 | 2 | 4 | 1 | 0 | 2 | 0 | 2 | 12 | 45½ | 1700 | 2 | 0 | 10 | 1 | 14 | 0 | 0 | 3 | 0 |
| 5.6 Inches Land Service | 1 | 4 | 1 | 1 | 8 | 0 | 9 | 1 | 0 | 15 | 1200 | 1 | 0 | 10 | 0 | 11 | 0 | 0 | 2 | 0 |
| 4.5 Inches Land Service | 1 | 1½ | 0 | 3 | 8 | 0 | 4½ | 0 | 7 | 8 | 1000 | 0 | 8 | 0 | 0 | 5 | 0 | 0 | 1½ | 0 |

The following is a ſimilar table for the lengths, weights, &c. of iron mortars uſed by us at preſent.

Iron Mortars.

| Nature. | Length. | Weight. | Powder for |  |  |  | Ranges at an Elevation of 45°. |
|---|---|---|---|---|---|---|---|
|  |  |  | Proof. | Burſting Shells. | Filling Shells. | Scaling. |  |
|  | ft. in. | cwt.qr.lb. | lb. oz | b. oz. | lb· oz. | lb. oz | yards |
| 13 Inches | 4 4 | 30 0 0 | 8 8 | 6 12 | 10 4 | 0 8 | 1800 |
| 10 Inches |  | 0 0 0 | 3 4 | 2 14 | 4 5 | 0 4 | 1600 |

The following is a ſimilar table for howitzers, as we now uſe them.

Brass Howitzers.

| Nature. | Length. | Weight. | Powder for |  |  | Weight of Shells empty. | Ranges at an Elevation of 45°. |
|---|---|---|---|---|---|---|---|
|  |  |  | Proving. | Scaling. | Burſting Shells. |  |  |
|  | ft. in. | cwt.qr.lb | lb. oz. | lb. oz. | lb. oz. | lb. | yards |
| 10 Inches | 3 11½ | 25 3 0 | 7 0 | 0 10 | 2 14 | 93 | 3000 |
| 8 Inches | 3 1 | 12 3 0 | 3 8 | 0 8 | 1 14 | 45½ | 2000 |
| 5.6 Inches | 2 2½ | 4 0 4 | 1 0 | 0 4 | 0 11 | 15 | 1400 |
| 4.5 Inches | 1 10 | 2 1 8 | 0 8 | 0 2 | 0 5 | 8 | 1200 |

The names of the ſeveral parts of a cannon are the following. See *Plate* I. *Cannon*, *fig*. 1.

A B is the whole length of the gun, which is reckoned from the hind part of the baſe ring, or the beginning of the caſcable, to the extremity of the muzzle or mouth of the piece: and the grand exterior diviſions are theſe that follow.

A E. The firſt reinforce, or that part of the gun which is next to the breech, and is made ſtronger than the other parts to reſiſt the force of the powder. It includes the baſe ring, the ogee next to it, the vent-field, the vent-aſtragal, and the firſt reinforce-ring. E F. The ſecond reinforce. It begins where the firſt reinforce ends, and is made ſomewhat ſmaller than the firſt. It includes the ogee next to the firſt reinforce ring, the trunnions, and the ſecond reinforce ring. F B. The chace, beginning where the ſecond reinforce ends, and extending from thence quite to the muzzle. It includes the ogee next to the ſecond reinforce ring, the chace-girdle and aſtragal, and the muzzle and aſtragal. H B. The muzzle, properly ſo called, reaches from the beginning of the muzzle aſtragal to the mouth of the piece. But the word muzzle is alſo ſometimes made uſe of to expreſs the mouth of the gun.

The ſmaller exterior diviſions of a cannon are the following:

A*h*. The caſcable, the hindermoſt part of the breech of the gun, extending from the baſe ring to the extremity of the knob or button. *b*. The caſcable-aſtragal, which is the part that diminiſhes between the two breech-mouldings. *c*. The neck of the caſcable, which is the narrow, rounding, diminiſhing part of the metal between the breech-moulding and the button. A C. The breech. The ſolid piece of metal or part of the gun from the vent to the extremity of the baſe-ring, terminating where the caſcable begins. A *i*. The breech-mouldings. They are thoſe eminent or prominent rounding parts between the baſe ring and the neck of the caſcable, and ſerve only as ornaments to the piece. *r s*. The baſe-ring and ogee, or reſiſtance. Theſe are ornamental mouldings, the latter of which is always ſomewhat in the ſhape of S. is taken from civil architecture, and made uſe of in guns, mortars, and howitzers. C D. The vent-field. It is the part that extends from the vent to the firſt reinforce-aſtragal. *t*. The vent-aſtragal and fillets, or the mouldings and fillets at or near the vent. *u*. The charging cylinder, which is all the ſpace or length from the chace aſtragal to the muzzle-aſtragal. *p q*. The firſt reinforce-ring and ogee, which is the ornament on the ſecond reinforce. *f*. The firſt reinforce-aſtragal, which is the ornament between the firſt and ſecond reinforce. F I. The chace-girdle, which is the ornament cloſe to the trunnions. T. The trunnions, which are two ſolid cylindrical pieces of metal, in every gun, which project from the ſame, and ſupport it on its carriage. G. The dolphins, which are two handles placed on the ſecond reinforce-ring of braſs guns, which reſemble the fiſh of that name. They are uſeful for mounting and diſmounting the guns with. V W. The ſecond reinforce ring and ogee are the two ornaments joining the trunnions. V. The ſecond reinforce-aſtragal, which is the moulding neareſt the trunnions. X. The chace-aſtragal and fillets are the two laſt mentioned ornaments taken jointly. Z. The muzzle-aſtragal and fillets are the joint ornaments neareſt to the muzzle. *m*. The ſwelling of the muzzle or projecting part behind the muzzle mouldings. *n*. The muzzle-mouldings, which are the ornaments at the very muzzle or mouth of the piece.

The interior parts of a cannon are the following:

*o*. The bore, is the interior cavity which receives the powder and ſhot. *a*. The mouth, is the entrance of the bore. *d*. The vent, which in all kinds of fire-arms is commonly or vulgarly called the touch-hole. It is a ſmall hole, pierced at or near the end of the bore or chamber for priming the piece with powder, or for introducing the tube, in order, when lighted, to ſet fire to the charge. *e*. The chamber, which is uſed only in guns of large calibers, is the place where the powder forming the charge is lodged.

The following are tools for loading and firing cannon.

Coins, or wedges, which are laid under the breech of a gun, for the purpoſe of either elevating or depreſſing it.

Handſpikes, for moving and laying it with.

Ladles, for loading the gun with looſe powder.

Rammers, which are cylinders of wood, of the ſame diameters and axes with the ſhot. They ſerve for ramming home the wads put upon the powder and ſhot.

The ſponge, which is fixed at the oppoſite end of the rammer, covered with lambſkin. It ſerves for cleaning out the gun when fired.

Screws, which are uſed with field-pieces, inſtead of coins or wedges. The ſcrew ſerves not only for elevating or depreſſing the gun, but for keeping it at the ſame angle of elevation or depreſſion.

The tools neceſſary for proving cannon are the ſearcher with a reliever, and the ſearcher with one point.

The ſearcher is an iron, hollow at one end to receive a wooden handle, and on the other end has from four to eight flat ſprings, of about eight or ten inches long pointed and turned outwards at the ends.

The reliever is an iron flat ring, with a wooden handle at right angles to it. When a gun is to be ſearched, after it has been fired, this ſearcher is introduced, and turned every way from end to end; and if there is any hole the point of one or other of the ſprings gets into it, and remains till the reliever, paſſing round the handle of the ſearcher, and preſſing the ſprings together, relieves it.

When there is any hole or roughneſs in the gun, the diſtance from the mouth is marked on the outſide with chalk.

The other ſearcher has alſo a wooden handle, and a point at the fore end, of about an inch long, at right angles to the length. About this point is put ſome wax mixed with tallow, which when introduced into the hole or cavity is preſſed in, when the impreſſion on the wax gives the depth; and the length is known by the motion of the ſearcher backwards and forwards. If a hole is one-ninth of an inch deep, the gun is rejected.

Cannon, *Conſtruction of.* Moſt nations in a great meaſure agree in the form and general diviſions of a cannon, with the exception that the French place the trunnions half a caliber farther back, or nearer to the breech than others.

As the lengths fixed on by general Armſtrong, formerly ſurveyor general of the ordnance, as beſt for ſome guns, in conſequence of experiments made by him, are ſtill retained by us, it may not be improper to give his general conſtruction both for braſs and iron cannon, which is as follows.

The whole length of the gun being divided into ſeven equal parts, take the length of the firſt reinforce, A E, equal to two of theſe parts, and that of the ſecond reinforce, E F, equal to one of theſe parts, together with one diameter of the bore, leaving the length of the chace equal to four of theſe parts, wanting one diameter of the bore.

The thickneſs of the breech, A C, or the diſtance from the hind part of the baſe ring to the beginning of the bore, is always equal to the thickneſs of the metal at the vent. The trunnions, T, are always one caliber or diameter of the bore in length clear of the ſecond reinforce ring, and as much in diameter; and they are placed in ſuch a manner, that a right line drawn through their centres touches the lower part of the bore, as in *fig.* 4. where that line is marked *a b*. The length of the caſcable, A *h*, is always equal to two calibers or diameters of the bore and a quarter.

The following are the general dimenſions of braſs guns, according to this conſtruction.

Suppoſing the caliber of the gun to be divided into 16 equal parts,

| | Inches. |
|---|---|
| The thickneſs of the metal, from the hind part of the baſe ring to the bore, or thickneſs of the breech will be | 16 |
| The thickneſs of the metal at the end of the firſt reinforce ring will be | 14.5 |
| Thickneſs of the metal at the ſame place, or at the beginning of the ſecond reinforce | 13.5 |
| Thickneſs of the metal at the end of the ſecond reinforce | 12.5 |
| Thickneſs of do. at the ſame place, or the beginning of the chace | 11.5 |
| Thickneſs of do. at the end of the chace or muzzle, excluſive of the mouldings | 8 |

*Mouldings.*

| | |
|---|---|
| Breadth of the baſe ring | 1.5 |
| Breadth of the ogee next to the baſe ring | 2.0 |
| Diſtance from the ogee to the fore part of the aſtragal one calibre | |
| Breadth of each of the fillets of the aſtragal | 0.28 |
| Breadth of the aſtragal, or half round | 0.56 |
| Total breadth of the aſtragal and fillets | 1.12 |
| Breadth of each of the fillets at the firſt and ſecond reinforce ring | 0.25 |
| Breadth of the firſt and of the ſecond reinforce rings | 1.25 |
| Breadth of the ogees, next to theſe rings | 1.5 |
| Breadth of the fillets at the muzzle | 0.25 |

The muzzle ogee in a 12 pounder, and guns of higher calibers is equal to 1.25 inches or 1¼ inch. But in a 9 pounder, and guns of ſmaller calibers, it is only equal to one inch. The chace-girdle and aſtragal are equal to one caliber.

The diſtance from the mouth of the gun to the muzzle aſtragal is equal to a diameter of the ſecond reinforce ring, in 18 pounders and guns of higher calibers; but in a 12 pounder, and guns of ſmaller calibers, it is equal to the diameter of the firſt reinforce-ring.

The riſing or ſwelling of the mouldings at the firſt and ſecond reinforces is about an eighth part of an inch; and the riſing of the baſe-ring is determined by laying a ruler to the extremities of the firſt and ſecond reinforce mouldings.

The diameter of the gun, through the ſwelling of the metal at the muzzle, is always equal to the diameter of the ſecond reinforce ring.

*Parts of the Caſcable.*

From the hind part of the baſe ring to the fore part of the fillet next to the button, the diſtance is equal to three-fourth parts of a caliber. The diſtance from the fore part of the fillet next to the button to the centre of the button is equal to one caliber. The diſtance from the hind part of the baſe ring to the hind part of the fillet, between the two ogees, is a ſixth part of the caliber. The diameter of the fillet next to the button is equal to one caliber and a half. The diameter of the neck of the caſcable is equal to three fourth parts of a caliber. The diameter of the button is ſomewhat more than one caliber.

It is proper to obſerve, that the ſhell at the vent is three inches broad, and reaches from the baſe ring to within a quarter of an inch of the vent-aſtragal, leaving that ſpace for the eaſe of turning. And the vent is the fifth part of an inch.

General dimenſion, according to this conſtruction, for iron guns.

Suppoſing the calibre of the gun to be divided into 14 equal parts, we ſhall have,

| | Parts. |
|---|---|
| The thickneſs of the metal at the vent from the bore | 16 |
| The thickneſs of do. at the end of the firſt reinforce, equal to | 14.5 |
| The thickneſs of do. at the beginning of the ſecond reinforce equal to | 13.5 |
| The thickneſs of do. at the end of the ſecond reinforce equal to | 12.5 |
| The thickneſs of do. at the beginning of the chace equal to | 11.5 |
| The thickneſs of do. at the end of the chace or muzzle, equal to | 8 |

The mouldings, and the reſt of the dimenſions, are nearly the ſame as in the braſs guns. The diameter of the vent, however, in his iron guns, is one-fourth part of an inch, whereas it is only a fifth part of an inch in his braſs cannon.

The length of braſs guns, according to him (general Armſtrong), are the following:

The

| | ft. | in. |
|---|---|---|
| The 32 pounder | 10 | 0 |
| The 24 pounder | 9 | 5 |
| The 18 pounder | 9 | 5 |
| The 12 pounder | 9 | 0 |
| The 6 pounder | 8 | 0 |
| The 3 pounder | 7 | 0 |
| The 1½ pounder | 6 | 0 |

And, according to him, the length of the iron

| | ft. | in. |
|---|---|---|
| 32 pounder was | 9 | 6 |
| Of the 24 pounder - | 9 | 0 |
| Of the 18 pounder - | 9 | 0 |
| Of the 12 pounder - | 8 | 0 |
| Of the 9 pounder - | 7 | 0 |
| Of the 6 pounder - | 6 | 6 |
| And of the 3 pounder - | 4 | 6 |

General Armſtrong, in order to aſcertain the fitteſt and beſt lengths for battering pieces, made experiments in 1736 with braſs 24 pounders of different lengths, but of nearly the ſame weight. After a great number of trials and experiments with them, he fixed on nine feet ſix inches as the beſt length for a 24 pounder battering piece, though ſome of the ranges with one only nine feet long, with the ſame charge of two-thirds of the weight of the ball, and with the ſame elevation, were ſomewhat greater than the greateſt of thoſe with one nine feet ſix inches long.

In the following table are the lengths of the 24 pounders with which he made a multiplicity of experiments, and three of the longeſt ranges of each, loaded with ſixteen pounds of powder.

BRASS 24 POUNDERS.

| Length. | Range in Yards. | Range in Yards. | Range in Yards. |
|---|---|---|---|
| ft. in. | yards | yards | yards |
| 10 6 | 2488 | 2614 | 2406 |
| 10 0 | 2570 | 2532 | 2436 |
| 9 6 | 2633 | 2560 | 2500 |
| 9 0 | 2796 | 2494 | 2563 |
| 8 6 | 2586 | 2490 | 2466 |
| 8 0 | 2438 | 2470 | 2453 |

Now it is obvious that if we even ſuppoſe all theſe pieces to have been bored exactly alike, and their vents to have been placed alſo exactly alike, with regard to the bottoms of their bores, theſe experiments are not calculated for determining preciſely the beſt length of a 24 pounder, either for battering in breach, or for any other ſervice. For theſe ſuppoſitions relative to their reſpective bores and vents being even granted, no other inference can be drawn from them than this, that nine feet ſix inches is about the beſt length for a 24 pounder, that is to be uſed with a charge of 16 pounds of powder. But a charge equal to two-thirds of the whole weight of the ball is prepoſterouſly large for any kind of ſervice whatſoever. It does not follow from them that nine feet ſix inches would have been found the beſt for a 24 pounder, had the charge he made uſe of been one-half, one-third, one-fourth, or even one-fifth part of the weight of the ball, the laſt of which, if the windage be very ſmall, is ſufficient even for battering with.

If a ſpecific charge of powder be fixed on as the fitteſt for a gun of a given caliber for a given ſervice, the beſt way to aſcertain the proper length of ſuch a gun, it appears, would be to have one of that caliber caſt longer than what is neceſſary, and then to cut it ſhorter and ſhorter, by a few inches at a time, firing it always at the ſame elevation with the given charge. But even this experiment would only determine its fitteſt length for that particular ſervice, with the ſaid aſſumed charge of powder. There ought to be guns of very different lengths, even of the ſame caliber, for different kinds of ſervice. For no one length for a gun of a given caliber will render it fitteſt for various ſpecies of ſervice.

Though the velocity increaſes with the length of the gun, yet it increaſes in a much ſmaller ratio, the velocities being in ratios ſomewhat leſs than the ratios of the ſquare roots of the lengths of the bore, and ſomewhat greater than the ratio, of the cube roots of the ſaid lengths, or nearly in middle ratios between the two. And as the range increaſes in a much leſs ratio than the velocity, being nearly as the ſquare root of the ſame, when the gun and elevation are the ſame, or nearly, as the fifth root of the length of the bore, it is evident that the range is very little increaſed by a great increaſe in the length of the bore. The increaſe, indeed, is ſo ſmall, that doubling the length of the gun does not augment the range more than about a ſeventh part.

As the eaſy and expeditious movement and conveyance of artillery from place to place are of the firſt importance on actual ſervice, and tend greatly to expedite and accelerate operations of an army in the field, it is a conſideration of the utmoſt conſequence to have field-pieces as light as poſſible, both by ſhortening the lengths of their bores, and leſſening their thickneſs of metal. A proper diminution of the windage would make the range of a ſhort gun as great as that of one of double the length with the cuſtomary windage.

The following is a table of the reſults of very uſeful experiments made at Mahon in Minorca in 1745 by general Williamſon, and other officers of artillery, with two iron 18 pounders, one of which was 11 feet long, and weighed 51 cwt. 0 qr. 5 lb. and the other 9 feet long, weighing 39 cwt. 1 qr. 3 lb. The object of theſe experiments was partly to determine which of theſe lengths was fitteſt for an 18 pounder, and partly to aſcertain what charge of powder would give the greateſt ranges with them.

| Length. | Number. | Elevation. | Ranges in Yards. | Powder. |
|---|---|---|---|---|
| 11 Feet. | 1 | 6 Degrees. | 1760 | 9 Pounds of Powder. |
| | 2 | | 1750 | |
| | 3 | | 1725 | |
| | 4 | | 1725 | |
| 9 Feet. | 5 | | 2000 | |
| | 6 | | 1830 | |
| | 7 | | 1965 | |
| | 8 | | 2018 | |
| 11 Feet. | 9 | 7½ Degrees. | 1800 | |
| | 10 | | 1935 | |
| | 11 | | 1960 | |
| | 12 | | 2048 | |
| 9 Feet. | 13 | | 2060 | |
| | 14 | | 2165 | |
| | 15 | | 2050 | |
| | 16 | | 2272 | |
| 11 Feet. | 17 | 10 Degrees. | 2490 | |
| | 18 | | 2395 | |
| | 19 | | 2567 | |
| | 20 | | 2670 | |
| 9 Feet. | 21 | | 2910 | |
| | 22 | | 2780 | |
| | 23 | | 2790 | |
| | 24 | | 2577 | |
| 11 Feet. | 25 | 12 Degrees. | 3016 | 9 Pounds of Powder. |
| | 26 | | 2720 | |
| | 27 | | 2800 | |
| | 28 | | 3000 | |
| 9 Feet. | 29 | | 2712 | |
| | 30 | | 2910 | |
| | 31 | | 2955 | |
| | 32 | | 3070 | |
| 11 Feet. | 33 | 15 Degrees. | 3185 | |
| | 34 | | 3095 | |
| | 35 | | 3400 | |
| | 36 | | 3185 | |
| 9 Feet. | 37 | | 3532 | |
| | 38 | | 2940 | |
| | 39 | | 3460 | |
| | 40 | | 3725 | |
| 11 Feet. | 41 | 10 Degrees. | 2550 | |
| | 42 | | 2377 | 10lb. |
| | 43 | | 2365 | |
| | 44 | | 2575 | |
| | 45 | | 2495 | 11lb. |
| 11 Feet. | 46 | 10 Degrees. | 2375 | 11lb |
| | 47 | | 2520 | |
| | 48 | | 2605 | 12lb. |
| | 49 | | 2645 | |
| | 50 | | 2730 | 10lb. |
| | 51 | | 2380 | |
| | 52 | | 2445 | |
| | 53 | | 2200 | 11lb |
| | 54 | | 2780 | |
| | 55 | | 2550 | 12lb |
| 9 Feet. | 56 | 45 Degrees. | 4160 | |
| | 57 | | 4135 | |
| | 58 | | 4100 | |
| | 59 | | 3970 | |
| | 60 | | 4015 | |
| | 61 | | 3930 | |
| | 62 | | 3700 | |
| | 63 | | 3960 | 10lb. |
| | 64 | | 3945 | |
| | 65 | | 3785 | 11lb. |
| | 66 | | 3930 | |
| | 67 | | 3802 | 12lb |

It appears from theſe experiments, that when thoſe eighteen pounders were charged with nine pounds of powder, their ranges were generally ſomewhat greater at the ſame elevation than they were when loaded with either more or leſs; and that thoſe of the eighteen pounder, nine feet long, exceeded thoſe of the other, eleven feet long, with the ſame charge of half the weight of the ball.

They have every appearance of having been made with attention and accuracy. But as they were all made with a charge of powder by far too great for any kind of ſervice with an eighteen pounder, no juſt concluſion can be drawn from them with regard to the beſt length for a gun of that caliber. Beſides, as there were only two lengths made uſe of, the only inference any one can be juſtified in deriving from them is this, that nine feet is a better length than eleven feet for an eighteen pounder, when fired with nine pounds of power. They have no tendency whatſoever to determine what length is fitteſt for a cannon of that caliber, when fired with ſix, or four, &c. pounds of powder.

Mr. Muller, however, regarded them as perfectly concluſive on this head, from finding that 4160 yards, the greateſt range of the piece, nine feet long, at an elevation of 45 degrees, with nine pounds of powder, differed only thirty yards from 4190 yards, the greateſt poſſible range of a gun of that caliber, according to an erroneous theory of his, founded on a miſconception of ſir Iſaac Newton's meaning, in the ſecond book of his Principia, and expreſſes himſelf exultingly in the following words. "Thus we have at laſt determined that important queſtion in artillery ſought for ever ſince its invention."

This gentleman, after aſſerting that the greateſt velocity which a leaden bullet of three quarters of an inch diameter can poſſibly have is that which, uniformly continued, would carry it through 395 feet per ſecond, animadverts on Mr. Robins's method of determining the velocities of ſhot in the following words.

"Mr. Robins thinks to prove, in his ſeventh problem, that the velocity of the foregoing leaden bullet is 1668 feet in a ſecond, which is more than four times greater than that above; and, what is more extraordinary, he pretends to have found the ſame velocity by experiments. As he ſeems to build his theory upon ſir Iſaac Newton's principles, had he read the 40th propoſition, book ſecond, of his Principia, he muſt have been convinced of his miſtake."

This is a heavy charge, and were it well founded, would, in a great meaſure, invalidate all that Mr. Robins has advanced, in regard to the determination of the firſt velocities of ſhot, as this is the only example that Mr. Robins calculates in his ſeventh propoſition from his theory of the elaſtic force of the fluid generated by the firing of gunpowder, which he compares, in his ninth propoſition, with the velocity aſcertained by means of his balliſtic pendulum, and finds to be almoſt the ſame. This is the place that Mr. Muller refers to, when he ſpeaks of Mr. Robins as pretending to have found the ſame velocity by experiments. It is, moreover, deſerving of obſervation, that Mr. Robins does not ſpeak of this velocity as the greateſt that can poſſibly be communicated to ſuch a ball. For a much greater one undoubtedly may be ſo communicated. And it cannot with juſtice be alleged that Mr. Robins built this part at leaſt of his theory on ſir Iſaac Newton's principles, as his method of determining the firſt velocities of bullets is entirely his own. The miſtake lies not with Mr. Robins, but with Mr. Muller himſelf, who could not, when he made the animadverſion, have read with proper attention the ſaid 40th propoſition of the ſecond book of the Principia, which relates entirely to the deſcent of bodies in an infinitely compreſſed and perfectly fluid medium; whereas Mr Robins's calculation juſt mentioned refers expreſsly to projectile motion: and that projectile velocity may be much greater than the greateſt velocity, by which a body can deſcend by its comparative weight in ſuch a fluid, is what no perſon, who has conſidered the ſubject with the leaſt attention, will offer to deny. Even Galileo himſelf, who was the firſt that ſtudied with any care the motions of projectiles and the nature of reſiſting mediums, ſeems to have been ſufficiently ſenſible of this truth. For, in his fourth dialogue, after obſerving that the heavieſt bodies would in time, by deſcending in the air, acquire a degree of velocity which could not afterwards be increaſed in the ſame manner as we ſee light bodies ſoon arrive at their greateſt velocity poſſible, he ſays, "This determinate and ultimate velocity may be called the greateſt which ſuch a heavy body can *naturally* obtain in the air. But this velocity I imagine to be much leſs than that which is given to the ſame ball flung by fired powder." And he propoſes to prove this, by firſt firing a muſket loaded with a leaden ball and a proper charge of powder from a hundred yards high or more againſt a ſtone pavement, and then firing the ſame with a like charge againſt a ſtone of the ſame ſort at a few yards diſtance, and examining which of the balls was moſt flatted. Every body now knows that this imagination of his was perfectly juſt.

Sir Iſaac Newton begins the ſaid propoſition in his ſecond book with a rule for determining the greateſt velocity, with which a globe can deſcend in an infinitely compreſſed and completely fluid medium. His words are the following: "Sit A pondus globi in vacuo, B pondus ejus in medio reſiſtente, D diameter globi, F ſpatium, quod ſit at $\frac{4}{3} \times D$ ut denſitas globi ad denſitatem medii, id eſt, ut A ad $A - B$; G tempus quo globus pondere B ſine reſiſtentia cadendo deſcribit ſpatium F; et H velocitas, quam globus hocce caſu ſuo acquirit. Et erit H velocitas maxima, quacum globus pondere ſuo B in medio reſiſtente poteſt deſcendere." This, however, is the very rule, as is found by calculation, that Mr. Muller made uſe of for determining the greateſt poſſible projectile velocity of a bullet of three quarters of an inch diameter, as well as thoſe of larger ones. It is not, therefore, to be wondered at, that he has given a very erroneous table of the greateſt poſſible velocities of ſhot of different diameters, from three pounds up to forty-eight, and of their greateſt ranges.

As twenty-one diameters of an eighteen pounder ſhot are nearly equal to nine feet, and as nine pounds of powder were a charge equal in weight to half that of the ſhot, Mr. Muller concluded that guns of all calibers having their lengths and charges reſpectively proportional to theſe, would give greater ranges than guns of the ſame calibers with any other lengths and charges, greater or leſs, would give, ſuppoſing, without ſufficient reaſon for doing ſo, the greateſt velocities to be always proportional to the diameters of the ſhot.

He accordingly, in his conſtructions for guns, makes both battering and garriſon cannon from eighteen to twenty-one diameters of their ſhot long reſpectively.

He allows, however, that though it is of advantage to know the beſt length and charge for every piece, the lengths of guns muſt depend on the ſervices they are intended for. He obſerves, that ſhip-guns ſhould, for various reaſons, be ſhort and light; that field-pieces, or battalion-guns, ſhould alſo be ſhort and light, in order to be able to advance or retire as faſt as the army; that battering pieces ſhould be long enough to prevent the flame of the powder, when they are repeatedly fired, from damaging much, or deſtroying very ſuddenly the ſides of the embraſures; and that garriſon guns ought to be of the lengths that give the greateſt ranges, to oblige the beſiegers to break ground at the greater diſtance, and to reach ſhipping, &c. from forts near the ſea, or navigable rivers, as far off from them as poſſible.

In his general conſtruction of braſs cannon for the land ſervice, he ſuppoſes the length of the gun to be twenty-one diameters of the ſhot from a twenty-four pounder incluſive, downwards, giving, however, the ſame length to the thirty-two pounder and to the forty-two pounder that he gives to the twenty-four pounder, making thereby the diameter of the firſt of theſe about nineteen diameters of its ſhot, and that of the laſt about ſeventeen diameters of its ſhot and one third.

*The Conſtruction is this.*

Let the length AB of the piece (ſee *fig.* 1.) be twenty-one diameters of its ſhot; and let the diameter of the ſhot be divided into twenty-four equal parts, from which all the reſt of the dimenſions are to be determined. Make the

| | | |
|---|---|---|
| Diameter of the bore equal to | 25 | ſuch parts. |
| The diſtance from A, the hind part of the baſe-ring, to D, the fore part of the vent-aſtragal | 40 | ſuch parts. |
| The thickneſs of the metal at the breech and vent | 18.5 | ſuch parts. |
| The thickneſs of the metal at the mouth | 9 | ſuch parts. |

Then the lines drawn from theſe points will determine the figure of the gun, which will be therefore from A to D cylindrical, and from thence to the mouth conical.

The centre line of the trunnions croſſes the centre line of the bore at right angles, and at the diſtance of three ſevenths of the whole length AB of the gun, from the hind part A of the breech; the diameter of each of them is equal to eighteen ſuch parts, and its length is equal to its diameter, excluſive of the projection of the ſecond reinforce ring. The length EF of the ſecond reinforce is always equal to two-thirds of AE, the length of the firſt reinforce. The breech AC, is equal to ſixteen ſuch parts; and the chace-girdle is equal to fourteen. The muzzle HB is equal to a tenth part of the whole length of the gun, which is here equal to 50.4 ſuch parts.

| | | |
|---|---|---|
| The breadth of the baſe-ring and ogee next to it are each of them equal to | 6 | ſuch parts. |
| The firſt and ſecond reinforce rings, and the ogee next to them, are each of them equal to | 5 | ſuch parts. |
| Each aſtragal and fillets are equal to | 4 | ſuch parts. |
| The cavetto at the mouth is equal to | 2.5 | ſuch parts. |
| And the fillets are each equal to | 1 | of ſuch parts. |

The baſe-ring projects the metal two ſuch parts, the firſt and ſecond reinforce rings, about one ſuch part; the fillets of the aſtragals, the half of one of ſuch parts; and the round of each aſtragal is deſcribed from a centre in the outline of the piece.

There is a circular ſhoulder about each of the trunnions, of which the diameter exceeds that of either of the trunnions by ſix ſuch parts, and projects ſo as to be even with the ſecond reinforce-ring.

As to the caſcable (ſee *fig.* 2.) the diſtance from A, the hind part of the baſe-ring, to C, the centre of the button, is equal to twenty-ſeven ſuch parts; the radius of the button to nine; the breadth of the quarter round to two; the ogee to five, and the fillets each to one. If from C, the centre of the button, right lines be drawn to the extremities E F of the baſe-ring, and points O, O be found in theſe lines equally diſtant from the button and the ſecond fillet, arcs deſcribed from theſe points with that diſtance will determine the neck, whilſt right lines O P parallel to C A, the direction of the axis of the piece, will fix the extremes, or limit the hind part of the ſecond fillet, and C F determines the firſt.

In order to deſcribe the ogee, join the extremities $n$, $q$ of the hind parts of the fillets; through the point $q$, draw the indefinite right line, $q\,p$ L, parallel to O $n$ produced; biſect the right line $n\,q$ in the point $s$, and through the point of biſection $s$ draw a right line making angles with $n\,q$ equal each to the angle $s\,q$ L, and meeting $q$ L and O $n$ produced in the points, $p$, P, reſpectively. Then arcs deſcribed from the points P, $p$, as centres, with a radius equal to P $n$, P $s$, or $p\,s$, will determine the ogee $n\,s\,q$. The quarter round is determined by ſo deſcribing an arc from a point $r$ in $p\,q$ produced, that it ſhall meet the hind part of the baſe-ring within one of ſuch parts, as the diameter of the ſhot contains twenty-four. The breadth of the ſhell is equal to ſix ſuch parts, and the diameter of the vent is a fifth part of an inch.

As to the muzzle (ſee *fig.* 3.) take the right line B K, equal to twenty ſuch parts, B P equal to ſix ſuch parts, and draw P L equal to B P, and at right angles to B K. From the point K draw alſo a right line perpendicular to B K. Then if the right line joining the points B, L be produced to meet this laſt-mentioned perpendicular in the point I, an arc deſcribed from this point as a centre, with the radius I L or I K, will determine the cavetto, or concave quarter, round L K. And if through the point $a$, at the diſtance of four ſuch parts from B H, and parallel to the ſame, the right line $a\,r$ be drawn, in it take a point $r$ at equal diſtances from the point L, and the extremity of the hind part of the fillet for deſcribing from as a centre, the quarter round, with this diſtance as radius.

From this conſtruction, with twenty-one diameters of the ſhot, for the lengths of braſs guns reſpectively for land ſervice, from a 24 pounder incluſive downwards; and with 14 diameters of the ſhot for lengths of iron field pieces reſpectively, he has given us tables of the weights and dimenſions of each, which are the following.

Table of the weight and dimenſions of braſs guns for land-ſervice.

| Caliber. | Length. | | Weight. | | |
|---|---|---|---|---|---|
| | ft. | in. | cwt. | qr. | lb. |
| 6 pounder | 6 | 1 | 8 | 0 | 4 |
| 9 pounder | 7 | 0 | 12 | 0 | 6 |
| 12 pounder | 7 | 8 | 16 | 0 | 8 |
| 18 pounder | 9 | 0 | 24 | 0 | 12 |
| 24 pounder | 9 | 8 | 32 | 0 | 16 |
| 32 pounder | 9 | 8 | 42 | 0 | 20 |
| 42 pounder | 9 | 8 | 52 | 0 | 24 |

Table of the weight and dimenſions of iron field-pieces.

| Caliber. | Length. | | Weight. | | |
|---|---|---|---|---|---|
| | ft. | in. | cwt. | qr. | lb. |
| 3 pounder | 3 | 3 | 2 | 1 | 0 |
| 6 pounder | 4 | 1 | 4 | 2 | 0 |
| 9 pounder | 4 | 8 | 6 | 3 | 0 |
| 12 pounder | 5 | 1 | 9 | 0 | 0 |
| 18 pounder | 5 | 10 | 13 | 2 | 0 |
| 24 pounder | 6 | 5 | 18 | 2 | 0 |

He gives another general conſtruction for braſs battering pieces on the ſuppoſition that the length, A B (ſee *fig.* 1.) of each is only equal to eighteen diameters of its ſhot, with all the other parts of the conſtruction remaining the ſame as above.

From this conſtruction he gives another table for braſs batttering pieces, and compares them with the old, as follows, Lengths and weights of braſs battering pieces.

| Old Pieces. | | | | | | New Pieces. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Caliber. | Length. | | Weight. | | | Caliber. | Length. | | Weight. | | |
| | ft. | in. | cwt. | qr. | lb. | | ft. | in. | cwt. | qr. | lb. |
| 6 pounder | 8 | 0 | 19 | 0 | 0 | 12 pounder | 6 | 7 | 13 | 2 | 0 |
| 9 pounder | 9 | 0 | 25 | 0 | 0 | 18 pounder | 7 | 6 | 20 | 1 | 0 |
| 12 pounder | 9 | 0 | 29 | 0 | 0 | 24 pounder | 8 | 4 | 27 | 0 | 0 |
| 18 pounder | 9 | 6 | 48 | 0 | 0 | 32 pounder | 9 | 2 | 36 | 0 | 0 |
| 24 pounder | 9 | 6 | 51 | 0 | 0 | 36 pounder | 9 | 6 | 40 | 2 | 0 |
| 32 pounder | 10 | 0 | 55 | 0 | 7 | 42 pounder | 10 | 0 | 47 | 1 | 0 |
| 42 pounder | 9 | 6 | 61 | 2 | 10 | 48 pounder | 10 | 6 | 54 | 0 | 0 |

Theſe conſtructions are on the ſuppoſition that the guns are cylindric as far as the charges reach, and from thence conical to the mouth. The centre line of the trunnions is alſo ſuppoſed to interſect the longitudinal axis of the bore of each gun at right angles, to prevent it, when fired, from injuring or deſtroying its carriage, which it will ſoon do if the ſaid line be lower.

The quantity and weight of metal in a gun by this conſtruction he determines in the following manner.

Take the diameter of the gun acroſs the centre of the bore at the muzzle without the mouldings, which is equal to forty-three ſuch parts as the twenty-four, into which the diameter of the ſhot is ſuppoſed to be divided, and the ſquare of it is - - - 1849

To this he adds the ſquare of ſixty-one, the number of ſuch parts in the diameter of the gun at the vent-aſtragal - - - 3721

To theſe he adds the rectangle under theſe two diameters or 43 × 61 - - - 2623

The ſum of theſe three products is - 8193

The third part of this ſum is - - 2731

Which multiplied by 392, the number of ſuch parts in the length D B as the twenty-four, into which the diameter of the ſhot is ſuppoſed to be divided, gives - - - 1070552

To this content add the ſquare of the diameter 61 by 40 the number of ſuch parts in the length A D 148840

To theſe two contents add four times the cube of eighteen ſuch parts for the contents of the trunnions, caſcable, and mouldings - 23328

And the ſum will be equal to - 1242720

From this ſum of theſe three contents deduct the ſquare of twenty-five, the number of ſuch parts in the diameter of the bore multiplied by its length 416 in ſuch parts - - - 260000

And the remainder will be equal to - 982720

Which content reduced in the proportion of the area of a circle to the ſquare of its diameter gives 771826 for the number of cubic ſuch parts, as the twenty-four, into which the diameter of the ſhot is ſuppoſed to be divided, that expreſs the ſolid contents of metal in the gun.

But the number of cubic parts in a ball, of which the diameter is equal to twenty-four parts, is about 7238.2464, by which, if 771826 be divided, we get 106.21 nearly, which increaſed in the proportion of the weight of gun metal to that of caſt iron, or of 8784 to 7425, becomes 125.65 nearly, or 126 in whole numbers nearly.

Whence it is manifeſt that this conſtruction gives the weight of each gun, equal to about 126 times the weight of its ſhot ſuppoſing the diameter of the bore to be to that of the ſhot as 25 to 24, a proportion, however, that certainly leaves by far too much windage. Thus a nine-pounder braſs gun by it will weigh 1134 lb. or 10 cwt. and 14 lb.

He then gives a general conſtruction for battering and garriſon iron cannon ſuppoſing the length A B of each to be equal to twenty-one diameters of its ſhot.

He ſuppoſes the diameter of the ſhot to be divided into twenty-four equal parts as in the preceding conſtruction, and makes the diameter of the bore equal to twenty-five ſuch parts. He makes the length from A, the hind part of the baſe-ring, to D, the fore-part of the vent-aſtragal, equal to forty-eight ſuch parts. He gives a thickneſs to the metal at A and D, taken from the bore, equal to twenty-five ſuch parts, or to one diameter of the bore; and he makes its thickneſs at B, the mouth of the piece, equal to twelve ſuch parts, or to half the diameter of the ſhot.

He ſuppoſes the centre line of the trunnions to interſect the axis of the bore at right angles, at the diſtance of three-ſevenths of the whole length of the gun, or nine diameters of the ſhot from A, the hind part of the breech. He makes the diameter of each of them equal to one diameter of the ſhot, and the length of each, free from the projection of the ſecond reinforce ring, equal to the ſame.

By this conſtruction he allows about two hundred weight of metal for every pound of the ſhot's weight, or makes the weight of each gun equal to about 224 times that of its ſhot. And from this proportion is derived the following table for

BATTERING AND GARRISON IRON-PIECES.

| Caliber. | Length. | | Weight. | | |
|---|---|---|---|---|---|
| | ft. | in. | cwt. | qr. | lb. |
| 3 Pounder | 4 | 10 | 6 | 0 | 0 |
| 4 Pounder | 5 | 4 | 8 | 0 | 0 |
| 6 Pounder | 6 | 1 | 12 | 0 | 0 |
| 9 Pounder | 7 | 0 | 18 | 0 | 0 |
| 12 Pounder | 7 | 8 | 24 | 0 | 0 |
| 18 Pounder | 9 | 0 | 36 | 0 | 0 |
| 24 Pounder | 9 | 8 | 48 | 0 | 0 |
| 32 Pounder | 9 | 8 | 56 | 0 | 0 |

The thirty-two pounder is the only gun in this table that is ſhorter than twenty-one diameters of its ſhot, being only about nineteen of the ſame. It is alſo heavier by two hundred weight, than two-hundred and twenty-four times the weight of its ſhot. For theſe deviations, however, from his general rule, he has aſſigned no reaſons. And for them we are inclined to think, that no good ones can be given. We are alſo of opinion, that a much ſmaller weight of metal for every pound of the ſhot's weight would be perfectly ſufficient.

In his conſtruction of braſs guns for ſhips, he ſuppoſes AB, the length of the piece, to be equal to fifteen times only the diameter of the ſhot; which diameter he divides, as above, into twenty-four equal parts, making the diameter of the bore equal to twenty-five ſuch parts.

He makes the diſtance from A, the hind part of the baſe-ring, to D, the fore part of the vent-aſtragal, equal to forty ſuch parts; the breech AC, equal to eighteen, the thickneſs of the metal at A, and at D, equal to twenty, and at B, the mouth of the piece, equal to ten. The reſt of the conſtruction is the ſame as above, with this exception, that the diameter, as well as the length of each of the trunnions, inſtead of being equal to one diameter of the ſhot, or twenty-four ſuch parts, is only equal to twenty.

By a ſimilar computation to that made uſe of above, it appears that this conſtruction allows about one hundred and twenty-four pounds of gun-metal for every pound of the ſhot's weight, or that the weight of each gun is by it about one hundred and twenty-four times that of its ſhot, from which proportion, the following table is very nearly framed.

Brass Ship Guns.

| Caliber. | Length. | | Weight. | | |
|---|---|---|---|---|---|
| | ft. | in. | cwt. | qr. | lb |
| 3 Pounder | 3 | 6 | 5 | 1 | 17 |
| 6 Pounder | 4 | 4 | 6 | 2 | 14 |
| 9 Pounder | 5 | 0 | 10 | 0 | 0 |
| 12 Pounder | 5 | 6 | 13 | 1 | 3 |
| 18 Pounder | 6 | 4 | 20 | 0 | 0 |
| 24 Pounder | 7 | 0 | 26 | 2 | 7 |
| 32 Pounder | 7 | 6 | 35 | 1 | 17 |
| 36 Pounder | 7 | 10 | 40 | 0 | 0 |
| 42 Pounder | 8 | 4 | 46 | 2 | 0 |
| 48 Pounder | 8 | 6 | 53 | 0 | 14 |

In his general conſtruction for iron ſhip-guns, he likewiſe ſuppoſes the length of each piece to be equal to fifteen diameters of its ſhot; the diameter of the ſhot to be divided into twenty-four equal parts; the diameter of the bore to be equal to twenty-five ſuch parts; the diſtance from A, the hind part of the baſe-ring, to D, the fore part of the vent-aſtragal, to be equal to forty ſuch parts; the breech AC to be equal to twenty-four ſuch parts, or to one diameter of the ſhot; the thickneſs of the metal at the vent to be equal to one diameter, and at the mouth to half a diameter.

It appears by computation, that the quantity of metal, allowed by this conſtruction, is at the rate of about one hundred and forty pounds, or of one hundred weight and one quarter to every pound weight of the ſhot; or that each gun is by it about one hundred and forty times as heavy as its ſhot; from which proportion the following table is derived.

| Caliber. | Length. | | Weight. | | |
|---|---|---|---|---|---|
| | ft. | in. | cwt. | qr. | lb. |
| 3 Pounder | 3 | 6 | 3 | 3 | 0 |
| 6 Pounder | 4 | 4 | 7 | 2 | 0 |
| 9 Pounder | 5 | 0 | 11 | 1 | 0 |
| 12 Pounder | 5 | 6 | 15 | 0 | 0 |
| 18 Pounder | 6 | 4 | 22 | 2 | 0 |
| 24 Pounder | 7 | 0 | 30 | 0 | 0 |
| 32 Pounder | 7 | 6 | 40 | 0 | 0 |
| 42 Pounder | 8 | 4 | 52 | 2 | 0 |
| 48 Pounder | 8 | 6 | 60 | 0 | 0 |

In conſtructing light field-pieces, he makes the length of each equal to fourteen diameters of its ſhot, ſuppoſes the diameter of the ſhot to be divided into twenty-four equal parts, and the diameter of the bore to be equal to twenty-five ſuch parts, or to be to that of the ſhot as twenty-five to twenty-four.

He makes A C, the thickneſs of the breech, equal to fourteen ſuch parts, the thickneſs of metal at the vent equal to ſixteen, or two thirds of the diameter of the ſhot, at the mouth equal to eight ſuch parts, or one third part of ſaid diameter; and the diſtance from A, the hind part of the baſe-ring, to D, the fore part of the vent-aſtragal, equal to thirty-nine ſuch parts.

Under the caſcable in each of theſe light pieces there is a ring of metal caſt, (ſee *fig.* 2.) for faſtening the head of the ſcrew, that is employed inſtead of coins or wedges for elevating or lowering the gun. This ring is deſcribed from the ſame centre and with the ſame radius that the neck is. The diameter of the hole for receiving the bolt is equal to five parts, and the thickneſs of the ring to four. The diameter, as well as the length of each trunnion, is equal to ſixteen parts, and the reſt of the conſtruction is the ſame as in the firſt.

By it the quantity of metal is at the rate of about eighty five pounds for every pound of the ſhot's weight, or the weight of each gun is about eighty-five times as great that of its ſhot, which proportion gives the following table.

Field Pieces.

| Caliber. | Length. | | Weight. | | |
|---|---|---|---|---|---|
| | ft. | in | cwt. | qr. | lb. |
| 3 Pounder | 3 | 3 | 2 | 1 | 2 |
| 6 Pounder | 4 | 1 | 4 | 2 | 5 |
| 9 Pounder | 4 | 8 | 6 | 3 | 8 |
| 12 Pounder | 5 | 1 | 9 | 0 | 10 |
| 18 Pounder | 5 | 10 | 13 | 2 | 16 |
| 24 Pounder | 6 | 5 | 18 | 1 | 5 |

He alſo gives a conſtruction for iron garriſon-pieces, ſuppoſing the length of each to be equal to eighteen diameters of its ſhot, and the reſt of the conſtruction to be the ſame as that for iron ſhip-guns, allowing thereby about one hundred and ſeventy-two pounds, and two thirds of a pound of metal to each piece, for every pound of the ſhot's weight, which proportion produces the dimenſions and weights in the following table.

Iron Garrison Pieces.

| Caliber. | Length. | | Weight. | | |
|---|---|---|---|---|---|
| | ft. | in. | cwt. | qr. | lb. |
| 3 Pounder | 4 | 2 | 4 | 2 | 12 |
| 6 Pounder | 5 | 3 | 9 | 1 | 0 |
| 9 Pounder | 6 | 0 | 13 | 3 | 12 |
| 12 Pounder | 6 | 7 | 18 | 2 | 0 |
| 18 Pounder | 7 | 6 | 27 | 3 | 0 |
| 24 Pounder | 8 | 4 | 37 | 0 | 0 |
| 32 Pounder | 9 | 2 | 49 | 2 | 18 |
| 42 Pounder | 10 | 0 | 64 | 0 | 0 |

### *Of ſhort Cannon, ſuch as Mortars, Howitzers, and Carronades.*

Mortars are a ſort of cannon with ſhort and large bores, with chambers, and are thought to be the firſt pieces of artillery that were uſed, as they were employed to throw balls of red-hot iron and ſtones long before the invention of ſhells, which is aſcribed to a native of Venlo, who at a feſtival celebrated in honour of the duke of Cleves, threw a number of them, one of which, falling on a houſe, ſet fire to it, which rapidly communicating to other building, reduced the greateſt part of the town to aſhes. Mortars which are generally believed to be a German invention, are ſaid to have been actually made uſe of for military purpoſes in 1435, when Naples was beſieged by Charles the 8th. But whether ſhells were then thrown out of them is uncertain. It is known, however, to a certainty, that ſhells were thrown from mortars at the ſiege of Wachlendonk, in Guelderland, by the earl of Mansfield, in 1588. Cyprian Lucas wrote upon the method of filling and throwing ſhells, in his appendix to the colloquies of Tartaglia, printed at London in 1588, in which performance, the method of compoſing and throwing carcaſes as well as various ſorts of fire-works, is alſo ſhewn.

Mr. Malter, an Engliſh engineer, is ſaid to have firſt taught the French the method of throwing ſhells, which they practiſed at the ſiege of Lamothe in 1634.

Mortars, however, have been long made uſe of, chiefly for throwing *hollow balls*, called *ſhells*, filled with a ſufficiency of powder for burſting them, which, falling on any building, or into the works of a fortification, or among troops encamped, forming in order of battle, in column, or landing from veſſels or boats, &c. are burſt or broken by the force or exploſion of the powder in them into a number of pieces or fragments, which, flying in all directions, occaſion trepidation and confuſion, and are deſtructive to every thing within their reach. They are alſo frequently made uſe of for throwing carcaſes, which are a ſort of ſhells with five holes filled with pitch and other combuſtibles, in order to ſet fire to buildings. Baſkets full of ſtones about the ſize of a man's fiſt, or of hand-grenades, are ſometimes thrown from them during a ſiege into the covert-way, on the men employed in defending it. The ingenious general Deſaguliers contrived a method of throwing bags from them filled each with from four to ſix hundred ſhot of different dimenſions. The effect of ſuch an application of them, by pouring down ſhot ſomewhat like a ſhower of hail on ſpots three hundred feet at leaſt each of them in circumference, muſt be awful and tremendous to troops moving in column, forming in line of battle, paſſing a defile, landing, &c. &c.

Mortars are, in this country, commonly diſtinguiſhed by the diameters of their bores. Thus a thirteen inch mortar, a ten inch mortar, an eight inch mortar, are thoſe which have the diameters of their bores reſpectively equal to thirteen, ten, and eight inches. Theſe are the three largeſt ſized mortars employed by us for land ſervice. Beſides them there are two ſmaller ſized ſorts of mortars, one of which is called a royal, having the diameter of its bore equal to 5.62 inches, and the other a coehorn, taking its name from its inventor, Mr. Coehorn, the celebrated engineer, and having the diameter of its bore equal to 4.52 inches.

The principal part of a mortar on the outſide, (ſee *fig.* 4.) are, A the chace, including the muzzle, B the reinforce, C the breech, and D the trunnions. The ſmaller exterior diviſions are, the vent, the dolphins, the vent-aſtragal and fillets, the breech-ring and ogee, the reinforce ring and ogee, the reinforce-aſtragal and fillets, the muzzle aſtragal and fillets, the muzzle-ring and ogee, and the ſhoulders.

The interior parts are, the chamber which receives the charge of powder, the bore where the ſhell is lodged, the mouth, and the vent.

The chamber is formed variouſly by different nations. The Spaniards chiefly uſe the ſpheric ; the French, the Germans, and the Dutch make uſe of various forms for it, as the conic, the cylindric, the bottled or the concave ; the Portugueſe the parabolic, and the Engliſh have uſually made it in form of a fruſtum of a cone. No very ſatisfactory reaſons, however, have been aſſigned for this variety.

Mortars are made of braſs, iron, or ſtone.

Land-mortars are thoſe that are uſed in ſieges and on other land ſervice mounted on beds. Both they and their beds are tranſported on truck-carriages. There is alſo a kind of land-mortar invented by count Buckeburg, which is mounted on a travelling carriage, and may be elevated to any degree at pleaſure.

Sea-mortars are thoſe that are made uſe of for ſea-ſervice, ſuch as the bombardment of places by water, &c. As the objects they are fired at and intended to deſtroy are generally at greater diſtances from them than thoſe to which land-mortars are required or expected to throw their ſhells, they are ſomewhat longer than them and much heavier.

Partridge-mortar is a common mortar ſurrounded by thirteen other little mortars bored round its circumference in the body of the metal. The large mortar in the centre is loaded with a ſhell, and the others with grenades. When it is fired by the vent the fire is ſo communicated at the ſame time to the ſmall ones, that both the ſhell and grenades go off at once. The French uſed them in the war of 1701, at the defence of Bouchain, in 1702, and at the ſiege of Liſle, in 1708.

Hand-mortars were frequently made uſe of before the invention of coehorns. They were fixed to the ends of ſtaves about four feet and a half long, of which the other ends were ſhod with iron for ſticking them in the ground. A bombardier elevated one of them at pleaſure with one hand, whilſt he fired it with the other.

The dimenſions of braſs land-mortars now made uſe of in our ſervice are the following.

| | Inches. | Inches. | Inches. | Inches. | Inches. |
|---|---|---|---|---|---|
| Diameter of the bore - - - - | 13 | 10 | 8 | 5.8 or<br>5.62 rather. | 4.6 or<br>4.52 rather. |
| Total length of the mortar - - - - | 44 | 33 | 25.5 to 26 | 16 to 16.[illegible] | 1[illegible].5 |
| Diſtance from the muzzle to the reinforce - - | 15.25 | 10 | 8.5 | 4.75 | 4.[illegible] |
| The length of the reinforce - - - - | 8.75 | 8.1 | 5 | 5 | 3.9 |
| The length of the trunnions from end to end - - | 32.5 | 26 | 20 | 12 | 9.2 |
| Diameter of the trunnions - - - - | 7.15 | 6.3 | 5 | 2.75 | 2.15 |
| The length of the bore - - - - | 24 | 18 | 13 | 8.5 | 7 |
| Length of the chamber - - - - - - | 12 | 7.8 | 7.75 | 4.3 | 3.7 |
| Greateſt diameter of the chamber - - - - | 6.6 | 4.5 | 4 | 3 | 2.7 |
| Leaſt diameter of the chamber - - - - | 6 | 3.6 | 3.4 | 2.4 | 1.4 |
| The diameter of the muzzle-ring - - - - | 21 | 15.15 | 11.2 | 8 | 6.4 |
| The breadth of the muzzle-ring - - - - | 1.1 | 0.8 | 0.7 | 0.6 | 0.5 |
| The breadth of the aſtragals and fillets - - - | 1.25 | 1 | 0.75 | 0 | 0 |
| Their diſtance from the muzzle-ring - - - - | 1.5 | 1 | 1 | 0 | 0 |
| The diameter near the muzzle aſtragal - - - | 18.1 | 13.2 | 10 | 6.9 | 5.6 |
| The diameter near the reinforce - - - - | 18.1 | 13.2 | 10 | 6.9 | 5.6 |
| The diameter of the reinforce - - - - | 21 | 15.15 | 15.1 | 8 | 6.4 |
| The breadth of the ogees - - - - | 1.5 | 1 | 1 | 0 | 0 |
| The diameter behind the breech-aſtragal - - - | 18.1 | 13.2 | 9.8 | 6.9 | 5.9 |
| | lb. oz. gr | lb. oz. gr | lb. oz. gr. | lb. oz. gr. | lb. oz. gr. |
| Chambers contain powder - - - - | 9 1 8 | 4 0 0 | 2 0 10 | 1 0 10 | 0 8 0 |

It is proper to obſerve, that the extremity of the bore next to the chamber is made round, and formed by an arc, which has its radius equal to that of the bore, and is terminated by the lines that form the chamber. The bottom of the chamber itſelf is ſemicircular. And the outſide of the metal is determined by a circular arc deſcribed from the ſame centre as the bottom of the chamber, and touching the lines drawn parallel to its ſides.

By means of theſe data, and the foregoing dimenſions accurately delivered, ſuch mortars may eaſily be conſtructed from the plate which exhibits the form of one.

The following are the dimenſions of the ſea-mortars that are uſed at preſent in our ſervice, (ſee *figs*. 5. and 6.), which are of two ſizes only, viz. of thirteen inches and ten inches bore.

| | Inches. | Inches. |
|---|---|---|
| The diameter of the bore - - | 13 | 10 |
| The whole length of the mortar - | 63 | 56 |
| The diſtance from the muzzle to the reinforce - - - | 21 | 20 |
| The length of the reinforce - - | 18 | 12 |
| The length of the bore - - | 24 | 30 |
| The length of the chamber - - | 21 | 15 |
| The greateſt diameter of the chamber | 8.5 | 6.6 |
| The leaſt diameter of the chamber - | 7 | 6 |
| The breadth of the muzzle-ring - | 3 | 2.4 |
| The breadth of the muzzle, ogee, and fillet - - - - - | 1.9 | 0 |
| From the muzzle to the aſtragal - | 0 | 0.4 |
| The breadth of the aſtragal - - | 0 | 1.6 |
| The breadth of the reinforce ring - | 1.9 | 0 |
| The breadth of the ogee next to the reinforce-ring - - - | 4.5 | 2.2 |
| The breadth of the chace-ring - | 1.5 | 0 |
| The breadth of the chace-ogee - | 2.2 | 0 |
| The breadth of the chamber-aſtragal | 0 | 1.6 |
| The thickneſs of the metal at the muzzle - - - - | 4.7 | 2.8 |
| The thickneſs of the metal at the muzzle-ring - - - - | $5\frac{3}{4}$ | 6 |
| The thickneſs of the metal near the reinforce - - - - | 4.7 | 3.3 |
| The thickneſs of the metal at the reinforce - - - - | 8 | 6 |
| The thickneſs of the metal behind the reinforce - - - - - | 9.5 | 6 |
| The length of the trunnion from end to end - - - - - | 45.4 | 36 |
| Its greateſt diameter - - - | 12 | 8 |
| Its leaſt diameter - - - - | 10 | 8 |
| Length or the part diminiſhed at each end - - - - - - | 6 | 0 |
| | lb. oz. gr. | lb. oz. gr. |
| The chamber contains powder - - | 32 0 0 | 12 8 0 |

Thickneſs of the metal at the muzzle, and near the rein-force is taken or meaſured from the lines produced, which determine the bore of the mortar; and behind the reinforce it is taken or reckoned from the lines which form and terminate the chamber. The round part, or the breech of the mortar, is circular, and in the ten-inch mortar is deſcribed from the ſame center that the bottom of its chamber is deſcribed from. But in the thirteen-inch mortar it is deſcribed from a center about three inches and a half nearer to the end of the mortar than that from which the bottom of its chamber is deſcribed. And in both theſe arcs ought to touch right lines drawn parallel to the ſides of the chambers.

The invention of Howitzers is of a much later invention than that of mortars. The Howitzer is, however, one of the moſt uſeful pieces of artillery, as it can be employed on moſt occaſions either as a cannon or mortar, and is eaſily moved by an army from place to place. It has its trunnions nearly in the middle, and is mounted on a carriage like a travelling gun carriage. The ten-inch howitzer is the largeſt in our ſervice, and is not much made uſe of. It has been reduced but little as to length, but materially in point of weight from what it was formerly. The following are the dimenſions of the eight inch howitzer that we now uſe. See *fig*. 7.)

| | Inches. |
|---|---|
| The diameter of the bore - - - - | 8 |
| The diſtance from the muzzle to the reinforce - - - - - | 16 |
| The length of the reinforce - - | 10.7 |
| The whole length of the howitzer - | 37.4 |
| The length of the bore - - - | 25.9 |
| The length of the chamber - - | 9.9 |
| The greateſt diameter of the chamber - | 4.6 |
| The leaſt diameter of the chamber - | 4 |
| The breadth of the muzzle ring - - | 1.25 |
| The diſtance from the muzzle ring to the aſtragal - - - - - | 4.6 |
| The breadth of the aſtragal - - | 0.7 |
| The breadth of the ogee before the reinforce - - - - | 1.4 |
| The breadth of the ogee behind the reinforce - - - - | 0. or it has none. |
| The breadth of the aſtragal behind the reinforce - - - - | 0.7 |
| The breadth of the baſe-ring - - | 1.25 |
| The thickneſs of the metal at the muzzle | 2.15 |
| The thickneſs of the metal at the muzzle ring - - - - | 3.4 |
| The thickneſs of the metal near the reinforce - - - - - - | 2.6 |
| The thickneſs of the metal at the reinforce | 3.4 |
| The thickneſs of the metal behind the reinforce - - - - | 2.5 |

| | Inches. |
|---|---|
| The diameter of the baſe-ring - - | 14.7 |
| The diameter at the vent-aſtragal - | 12.5 |
| The diameter of the caſcable - - | 7.6 |
| The diameter of the button - - | 5 |
| The diameter of the neck - - - | 3.5 |
| The breadth of the firſt ogee and fillets | 0.9 |
| The breadth of the ſecond ogee and fillets | 0.9 |
| The diameter of the firſt fillet - - | 9.5 |
| The diameter of the ſecond fillet - | 4.5 |
| The length and the diameter of each trunnion - - - - | 4.4 |
| The diſtance from the fore part of the reinforce to the trunnions - - - | 1.2 |
| | lb. oz. |
| The chamber contains powder - - | 4 0 |
| | cwt. qr lb. |
| The weight of the howitzer - - | from 12 3 0 to<br>12 1 11 |

The conſtructions of howitzers are almoſt as variable and uncertain as thoſe of mortars, as moſt artilleriſts have notions of their own reſpecting the figures of both. Our mortars have not been conſtructed from principles well aſcertained, or from any general rule applicable to all ſizes of them. Neither have our howitzers. Mr. Muller was the firſt that we know of, that made even any attempt at ſuch general rules for the conſtruction of either of all ſizes. But he neither demonſtrates the principles of his general rules, nor proves them to be unexceptionable. His general dimenſions for land mortars ſuppoſing the diameter of the bore of each to be divided into thirty equal parts are the following. See *fig*. 8.

| The diameter of the bore - - - | Diameter of the bore divided into 30 equal parts. | Diameter of the bore divided into 30 equal parts. | Diameter of the bore divided into 30 equal parts. |
|---|---|---|---|
| The diameter of the chamber - - - | 10 ſuch parts | 10 ſuch parts | 10 ſuch parts |
| The length of the bore equal to - - - | 54 | 45 | 40 |
| The length of the chamber equal to - - | 22 | 21 | 20 |
| The diſtance from the end of the chamber to the end of the mortar - - - - - - | 16 | 15 | 14 |
| The total length of the mortar equal to - - | 92 | 81 | 74 |
| The diſtance from the mouth *a* to the reinforce *b* - | 30 | 26 | 21 |
| The length of the reinforce *b c* equal to - - | 18 | 14 | 14 |
| The breadth of the muzzle-ring and fillets - - | 3.5 | 3 | 3 |
| The breadth of the ogee next to it - - - | 3 | 2 | 2 |
| The diſtance from the ogee to the muzzle aſtragal - | 5 | 4 | 3 |
| The breadth of the aſtragal and fillets - - | 2.5 | 2 | 2 |
| The breadth of the ogee before the reinforce - | 3 | 2 | 2 |
| The breadth of the two ogees and fillets behind the reinforce - - - - - - - | 6 | 5 | 4 |
| The thickneſs of the metal at the muzzle - - | 5 | 4.5 | 4 |
| The thickneſs of the metal near the reinforce - - | 6 | 5 | 4.5 |
| The thickneſs of the metal at the reinforce - - | 7 | 5.5 | 5 |
| The thickneſs of the metal at the chamber - - | 12 | 12 | 12 |
| The thickneſs of the metal at the muzzle-ring - - | 6.5 | 5.5 | 5 |
| The diameter of the trunnions - - - | 14 | 13 | 12 |
| The length of the trunnions from the mortar - - | 15 | 14 | 13 |
| The cube of the diameter of the bore in inches - - | $d^3$ | $d^3$ | $d^3$ |
| The quantity of powder in lb. which the chamber contains is nearly equal to - - - - | $\frac{d^3}{421}$ | $\frac{d^3}{442}$ | $\frac{d^3}{466}$ |
| The weight of the mortars equal nearly to - - | $\frac{5d^3}{6}$ | $\frac{2d^3}{3}$ | $\frac{3d^3}{5}$ |

Without attempting, as we have already obſerved, to demonſtrate the principles of this general conſtruction, he tells us that he has endeavoured to diſpoſe, diſtribute, or arrange the metal in ſuch a manner, as to make the relative degrees of ſtrength in the different parts proportional to the forces which act upon them. He thinks the thickneſs of metal at the chamber ſufficient, as it exceeds by two parts the diameter thereof, which is more in proportion than what is ever allowed to any braſs gun whatever. He obſerves that though the mortar on the outſide ought to be conical from the chamber to its mouth, to ſuit the action of the powder, he has, in compliance with common practice, given it a reinforce juſt ſufficient to admit of an ogee.

He tells us he does not pretend to determine the true poſition of the vent, though he had always found that the nearer it was placed to the bottom of the chamber, the farther the mortar threw the ſhell with a given charge of powder. As he made theſe experiments, however, with only a three-inch mortar, he apprehends that no juſt concluſions can be drawn from them with regard to mortars of a larger ſize.

He delivers it as his opinion, that the cylindric figure is the beſt for the chambers of ſuch mortars, obſerving, that though the bottled or concave chambers, or thoſe which have the ſmalleſt entrances, will throw ſhells farther than any others; yet in thoſe which require but little powder their entrances would be too narrow, and it would be troubleſome to clean them; whereas, when they are cylindrical, they are very nearly as advantageous for throwing ſhells without being ſubject to theſe inconveniencies.

He informs us, that he and general Deſaguliers made ſeveral experiments with chambers of different forms or figures, which contained the ſame quantity of powder, and uniformly found, that the cylindric threw the ſhell farther than any other, of which the entrance was larger, particularly when they were not quite filled; that they alſo made ſome experiments with cartridges of common writing paper holding charges of powder only equal reſpectively to half the content of the chamber, and found that when ſuch a cartridge was ſo placed in the chamber as to be cloſe to the ſhell, leaving a vacuity between it and the bottom, it threw the ſhell nearly twice as far as it did when it touched the bottom of the chamber, and left a vacancy between itſelf and the ſhell; that theſe experiments were repeated ſeveral times, and always gave the ſame reſult. He alſo informs us, that on filling the chamber partly with powder and putting a piece of common writing paper upon it, he found that the ſhell went much farther than the ſame charge without paper threw it; that they likewiſe made repeated experiments with a cylindrical chamber, and a conical one of the ſame length and content, that had its diameter at the bottom equal only to half that at its entrance, and obſerved, that when theſe chambers were not quite filled, the cylindric one uniformly threw the ſhell much farther than the other did.

The firſt ſort of mortars in this general conſtruction, or thoſe of which the weights are expreſſed by $\frac{5d^3}{6}$, have the ſame lengths which the land mortars have that we now make uſe of. The ſecond, or thoſe of which the weights are expreſſed by $\frac{2d^3}{3}$, are of the ſame lengths with thoſe the French have been in the practice of uſing. And the third ſort, that have their weights denoted by $\frac{3d^3}{5}$, are ſhorter than either. In each of them the chamber is cylindric, and the bottom of it a hemiſphere. And the round part of the mortar is deſcribed from the ſame centre as the bottom of the chamber.

In his general conſtruction for ſea mortars the dimenſions are the following. See *fig.* 9. Our ſea mortars, as we have already obſerved, are of two ſizes only, viz. of 13 inches and 10 inches.

| The diameter of the bore | Diameter of the bore divided into 30 equal parts. | Diameter of the bore divided into 30 equal parts. |
|---|---|---|
| The length of the bore | 75 ſuch parts | 75 ſuch parts |
| The diameter of the chamber | 15 | 15 |
| The length of the chamber | 33 | 33 |
| The diſtance from the end of the chamber to the end of the mortar | 20 | 20 |
| The total length of the mortar | 128 | 128 |
| The diſtance from the muzzle *a*, to the reinforce *b* | 43 | 43 |
| The length of the reinforce *bc* | 28 | 28 |
| The thickneſs of the metal at the muzzle, the mouldings excepted | 8 | 7 |
| The thickneſs of the metal near the reinforce | 9 | 8 |
| The thickneſs of the metal at the reinforce | 10 | 9 |
| The thickneſs of the metal at the chamber | 16 | 16 |
| The breadth of the muzzle-ring and fillets | 4 | 4 |
| The breadth of the ogee next to it as alſo of that before the reinforce | 3 | 3 |
| The diſtance from the ogee to the muzzle-aſtragal | 6 | 6 |
| The breadth of the aſtragal and fillets | 3 | 3 |
| The breadth of the ogee behind the reinforce | 4 | 4 |
| The muzzle-ring projects the metal by | 1.5 | 1.5 |
| The diameter of the trunnions | 18 | 18 |
| The length of each trunnion from the mortar | 20 | 20 |
| The cube of the diameter of the bore | $d^3$ | $d^3$ |
| The quantity of powder in lbs. which the chamber contains | $\frac{d^3}{126}$ | $\frac{d^3}{126}$ |
| The weight of the metal | $2.1 \times d^3$ | $1.8 \times d^3$ |

The arc which determines the round part of each mortar is deſcribed from the ſame centre which the arc, that determines the bottom of the chamber, is deſcribed from.

The weights of our preſent ſea mortars, and the quantities of powder which their chambers contain, compared with thoſe which theſe conſtructions give, will ſtand as follows.

| | Inches. | | | Inches. | | |
|---|---|---|---|---|---|---|
| The diameter of the bore | 13 | | | 10 | | |
| | cwt. | qr. | lb. | cwt. | qr. | lb. |
| The weights of our preſent ſea-mortars | 82 | 0 | 0 | 33 | 0 | 0 |
| The weights of ſea-mortars by the firſt of theſe two conſtructions $=2.1\times d^3$ | 41 | 0 | 19 | 18 | 2 | 19 |
| The weights of ſea-mortars by the ſecond of theſe conſtructions expreſſed by $1.8\times d^3$ | 35 | 1 | - | 16 | 0 | 7 |
| | lb. | oz. | gr. | lb. | oz. | gr. |
| The quantities of powder, which the chambers of our preſent ſea-mortars contain | 32 | 0 | 0 | 12 | 8 | 0 |
| The quantities of powder, which the chambers of ſea-mortars by theſe conſtructions would contain | 17 | 7 | 0 | 8 | 0 | 0 |

Beſides theſe kinds of mortars for throwing ſhells and carcaſſes, there is another ſort of mortar for throwing ſtones either by the beſieged from the body of the place, the outworks, or covert way into the beſiegers approaches on the glacis, &c. or by the beſiegers into the covert way, &c. as they approach the ſame. There are no ſuch mortars employed in our ſervice; becauſe hand-grenades, or ſmall ſhells thrown from a common mortar with ſmall charges of powder, anſwer the purpoſe intended much better than ſtones.

The following, however, are the dimenſions of a fifteen-inch ſtone mortar, ſuppoſing the diameter of the bore to be divided into thirty equal parts. See *fig.* 12.

| | |
|---|---|
| The diameter of the bore divided into | 30 equal parts |
| The length of the bore | 37 ſuch parts |
| The length of the chamber | 16 |
| The greateſt diameter of the chamber | 8 |
| The leaſt diameter of the chamber | 6 |
| The diameter of the cylindric part to hold a wooden tompion | 14 |
| The depth or axis of that cylinder | 3 |
| The diſtance from the muzzle to the reinforce | 20.5 |
| The length of the reinforce | 8 |
| The thickneſs of the metal at the muzzle | 3.5 |
| The thickneſs of the metal at the reinforce | 4.5 |
| The thickneſs of ditto at the chamber-belt | 9 |
| The thickneſs of ditto at the entrance of the chamber | 6 |
| The chamber enters into the trunnions by | 2 |
| The breadth of the muzzle-ring and fillets | 3 |
| The breadth of the chamber-belt is equal to | 2 |
| The breadth of the ogee next to that belt | 3 |
| The cube of the diameter of the bore | $d^3$ |
| The quantity of powder in lbs. which the chamber contains | $\frac{d^3}{1102}$ |
| The weight of the metal contained in this mortar | $\frac{d^3}{3.1}$ |

The dimenſions, according to his conſtruction, of howitzers of three different weights, with the ſame bore, are the following. See *fig.* 10.

| | | | |
|---|---|---|---|
| The diameter of the bore divided into equal parts | 30 | 30 | 30 |
| The length of the bore | 90 | 90 | 97.5 |
| The diameter of the chamber | 15 | 15 | 15 |
| The length of the chamber | 33 | 33 | 33 |
| The diſtance from the muzzle *a*, to the reinforce *b* | 50 | 50 | 54.5 |
| The length of the reinforce *b c* | 34 | 34 | 37 |
| The diſtance from the reinforce *c*, to the end of the howitzer | 50 | 50 | 50 |
| The whole length of the howitzer | 134 | 134 | 141.5 |
| The thickneſs of the metal at the muzzle | 8 | 7 | 8 |
| The thickneſs of the metal near the reinforce | 9 | 8 | 9 |
| The thickneſs of the metal at the reinforce | 10 | 9 | 10 |
| The thickneſs of the metal at the chamber | 16 | 15 | 16 |
| The breadth of the muzzle-ring as alſo of the baſe-ring, fillets included | 5 | 5 | 5 |
| The breadth of each of the ogees, that behind the reinforce excepted | 3.5 | 3.5 | 3.5 |
| The diſtance between the muzzle ogee and aſtragal, as alſo between the breech ogee and aſtragal | 6 | 6 | 7 |
| The breadth of the muzzle-aſtragal and fillets, as alſo of the breech aſtragal and fillets | 3 | 3 | 3 |
| The breadth of the ogee behind the reinforce | 6 | 6 | 6 |
| The muzzle and baſe-rings project the metal each by | 1.5 | 1.5 | 1.5 |
| The length of the trunnions | 18 | 18 | 18 |
| The diameter of the trunnions | 15 | 15 | 15 |
| The diſtance of the trunnions from the fore end of the reinforce | 5 | 5 | 5 |
| The cube of the diameter of the bore | $d^3$ | $d^3$ | $d^3$ |
| The quantity of powder in lbs. which the chamber contains | $\frac{d^3}{116}$ | $\frac{d^3}{116}$ | $\frac{d^3}{116}$ |
| The weight of the howitzer | $2.25d^3$ | $1.97d^3$ | $2.4d^3$ |

The length of the caſcable is equal to 24 ſuch parts, the radius of the button to 8, and the ogee with the fillet included is equal to 4.

It is ſomewhat ſurpriſing that howitzers are not more made uſe of than they are even in the field. For they may be employed ſucceſsfully for throwing, not only large ſhells, but large, ſolid, or cored ſhot, either point blank, or with ſmall angles of elevation, and with charges of powder ſuited to different ranges and grazing diſtances to the great annoyance both of cavalry and infantry, particularly in column. They are alſo much fitter than guns for diſcharging grapes of ſmall ſhot and ſmall ſhells from ſhort diſtances at ſieges; and are peculiarly calculated for ſweeping or ſcouring the covert way along its ſeveral branches with ſhells fired *en ricochet*. No earthen works are proof againſt them when a judicious uſe is made of them. Even at ſieges, when the works have revetements, or demi-revetements of maſonry, as ſoon as the walls which ſupport the earth of the rampart and parapet are battered down, there is no ſpeedier or more effectual way of completing the breaches and rendering them practicable than by throwing ſhells into the earth where it is bared of maſonry. For they lodge or bury themſelves in it, and burſting operate as ſmall mines.

*Fig.* 11 repreſents a mortar with a bottled or concave chamber, the diameter, *a b*, of the entrance of which is a third part of the diameter of the bore. The diſtance from *a b* to *c d* drawn parallel and equal to it in the longitudinal ſection is equal to twenty-ſix ſuch parts as thoſe, of which the diameter of the bore contains thirty. The conjugate diameter of the chamber is equal to twenty ſuch parts. The form of the outſide of the mortar, where the chamber is, is ſimilar to that of the chamber itſelf. The thickneſs of the metal at the chamber is equal to ſixteen ſuch parts, and all the other dimenſions are the ſame as in the firſt conſtruction for mortars above.

As the entrance of the chamber has its diameter equal to a third part of the diameter of the bore of the mortar, it is large enough in one of either thirteen or ten inches for admitting a man's hand to clean it without inconvenience, and may therefore be loaded without difficulty.

Beſides theſe pieces of ordnance, there is another, that is now pretty generally uſed, and is called a carronade, from a foundery that has for a conſiderable time been carried on by a company under the name of the Carron company, on the banks of the river Carron in Scotland. The carronade is a gun of a ſort of intermediate length and weight between the cannon and the howitzer, and not a very ſhort howitzer, as the celebrated Dr. Hutton has inadvertently obſerved in his Mathematical Dictionary. The firſt ſuggeſter, propoſer, or inventor of it was the preſent learned and ingenious General Robert Melville, ſo well known for his talents as a military antiquarian, and the diſcoverer of the temporary Roman camps in North Britain. He at firſt ſuggeſted that not only ſolid but ſhell ſhot might be thrown from it, and afterwards that it might be employed for throwing carcaſſes and cored ſhot. The firſt gun of this nature was caſt and conſtructed according to his ſuggeſtions at Carron in 1779 after a rupture with France, and during the American war. The operation was performed under the directions of that very able founder, Charles Gaſcoigne Eſq. then director of that foundery.

The diameter of its bore was equal to eight inches, having the ſame caliber with an eight-inch mortar or howitzer.

The length of its bore including the chamber was equal to ſix diameters of the ſame very nearly, or to ſix times its caliber or four feet.

The diameter of its chamber was equal to the caliber of a forty-two pounder gun, and contained five pounds and a half of powder.

Its weight was nearly equal to that of the navy twelve pounder-gun, being equal to 31 cwt.

The ſhot was caſt in an eight-inch ſpherical iron mould, and the windage was formed by the retreat or ſhrinking of the metal of the ſhot in cooling, which when cold weighed about 68 pounds, or about four pounds leſs than a ſolid iron ſhot or ball eight inches in diameter, which weighs about 72 pounds very nearly. From this circumſtance it came to be called a 68 pounder, though its original propoſer or inventor gave it the name of a *ſmaſher* from its effects, particularly when fired with ſhot at timbers or wooden work. It was at firſt deſigned for a ſhip gun. And there is now in the poſſeſſion of General Melville a ſmall model of it mounted on its carriage on a ſmall platform, to one end of which is faſtened a wooden repreſentation, in miniature, of part of a ſhip's ſide, with a port, and the following inſcription in braſs, let in on the top thereof.

"Gift of the Carron company to Lieutenant General Melville, inventor of the ſmaſhers and leſſer carronades for ſolid, ſhip, ſhell, and carcaſs ſhot, &c. firſt uſed againſt French ſhips in 1779."

In the middle of the lower carriage there is a longitudinal groove, along which the gun on its upper carriage recoils. And when ſo mounted, it may be pointed in any angle leſs than forty degrees either to the right or left of this groove. A port or embrazure large enough for a 24 or 32 pounder gun is alſo ſufficiently large for receiving the ſmaſher or 68 pounder carronade.

Several experiments were made with one of this caliber the ſame year, viz. in 1779, at Carron, in the preſence of Sir Adolphus Oughton, K. B. then commander in chief in Scotland, General Melville, and many other officers, ſome of whom were of the corps of artillery and engineers, with ſuch ſucceſs, both in regard to the projectile force, with which the ſhell-ſhot were thrown, and not only the practicability but alſo the certainty of their producing powerful effects, by burſting wherever they ſhould penetrate, as perfectly convinced Sir Adolphus and all the reſt, that in all fit caſes, which might be many, by ſea as well as by land, for the uſe of this ſpecies of artillery, the introduction of ſuch pieces of ordnance both into his Majeſty's naval and military ſervice would be of the greateſt utility and advantage. Sir Adolphus thought it therefore his duty to tranſmit to government a fair and candid report of the experiments he had ſeen made, and a ſtatement of the advantages which he conceived might be obtained by a judicious and proper uſe of ſuch guns. It happened, however, that no encouragement was then given to the introduction of this ſpecies of cannon, though it was ſo reſpectably recommended and approved of by intelligent profeſſional men, becauſe it was regarded as a novelty, an innovation, and a departure from common hacknied practice and cuſtoms, by which public boards, that are but rarely compoſed of individuals of the firſt talents, liberality, and information, are for the moſt part too ſlaviſhly governed. The proprietors of the Carron foundery, however, were adviſed to try whether pieces of ſundry ſmaller dimenſions, caſt and conſtructed on the ſame principle, would not meet with a ſufficient ſale for private veſſels of war, as letters of marque and repriſals, and perhaps for ſome of the royal frigates. They made the trial, and ſucceeded. For, beſides a pretty frequent demand that was made for them during the remainder of that war for the uſe of the two former deſcriptions of veſſels, on account of the great advantages they were found in practice to poſſeſs over common guns of the ſame weights, and much ſmaller calibers, there were ſome of the larger ſort or of 8 inches caliber, called ſmaſhers by the original propoſer, introduced by degrees into the navy. Two of the naval officers, who firſt made uſe of them on board their ſhips, were Captain Keith Elphinſtone, now Admiral Lord Keith, and Captain Henry Trollope, now Sir Henry Trollope, the latter of whom, in a moſt remarkable inſtance, by means of two ſmaſhers which he had on board his frigate, beat off ſeveral of the enemy's, who were panicſtruck on viewing the ſize of ſome of the ſhot he fired into them.

Soon after the commencement of the royal war againſt France, in which Great Britain engaged early in 1793, carronades of various dimenſions, but few of the larger ſize, or ſmaſhers, improperly called 68 pounders from each of their ſolid iron-balls, which are not near ſo fit for ſea ſervice as hollow or cored ſhot of the ſame diameter, but much lighter, came rapidly into uſe in our ſhips of war and other armed veſſels, and often proved to be of the greateſt utility and advantage.

vantage. They have ever ſince been reckoned ſo uſeful, that there is now hardly a ſhip in our navy or an armed veſſel, that is altogether without them.

When the carronades were firſt introduced, they were meant chiefly for the defence of merchant ſhips, and were calculated, by their conſtruction, to be of ſuch lengths and weights as might be convenient for the ſizes of the veſſels that were to carry them, ſuppoſing each of them to be loaded with a twelfth part of the weight of its ſhot, as the ſervice-charge of powder. The Board of Ordnance was pleaſed to order a number of them for the navy: and their firſt warrant for about 1500 of them was completed before Mr. Gaſcoigne was certainly informed that the board had fixed on one-ninth inſtead of a twelfth part of the weight of the ſhot as the charge of powder for ſervice. Theſe were therefore reckoned both too light and too ſhort for the navy. And on the Board's afterwards ordering 20 carronades of each of the natures of 12, 18, 24, and 32 pounders, he very naturally took the liberty of adding both to the length and fortifications of each of them, ſo as to increaſe its ſtrength and power of reſiſtance to burſting, in proportion to this perhaps ill-judged addition to the charge of powder, ſubſtituting alſo a ſcrew inſtead of the quoin or wedge. Forty of them were proved at Woolwich, and were afterwards rejected on account of theſe very improvements.

The late colonel Fraſer, of the engineer corps, made a number of experiments at Leith with a ſmaſher, or 68 pounder carronade, both with its own ſolid ſhot and with common eight-inch ſhells, which were corroded by ruſt, and, independent of that circumſtance, had by far too much windage. And it is worthy of remark, that notwithſtanding this, the ſhells went farther than the ſolid ſhot before they met the ſurface of the earth or of the water, or had their firſt grazes greater when the gun was fired, either horizontally or point blank, or with any elevation not exceeding two degrees, but that with any elevation from two degrees upwards the ſolid ſhot went fartheſt.

The following is an exact ſtatement of experiments made at Languard fort on the 27th and 28th of July, 1780, by order of marquis Townſhend, then lord viſcount Townſhend, and maſter-general of the ordnance, and comparative trials with a ten and eight-inch howitzer.

*Practice with a 68 pounder carronade, or ſmaſher.*

The weight of the piece in cwt. qr. lb. 29 0 0.

The length of the piece in feet and inches, from the hind part of the baſe ring to the muzzle, 3 $11\frac{9}{10}$.

The length of the bore, chamber included, 3 11.

The diameter of the bore, 8 inches.

The nature of the rope for breaching, 2½ inches.

The length of the recoil, in feet and inches, 12 3.

Weight of the ſolid ſhot, 68 lb.

Weight of the ſhell ſhot, 57 lb.

| Time when. | Rounds. | Weight of Powder. | Diameter of | | Windage. | Elevation. | Time of Flight to firſt Fall. | Grazes | | | Extreme Range. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Shot. | Shells. | | | | 1 | 2 | 3 | |
| 1780. | No. | lb. oz. | inches | inches | inches | degrees | ſecs. | yards | yards | yards | yards |
| 27th July | 1 | 4 0 | 7.90 | | 0.10 | Point blank. | 3½ | 154 | 508 | 875 | 1345 |
| | 2 | | | 7.94 | 0.06 | | 2½ | 168 | 473 | 816 | 1365 |
| | 3 | | 7.94 | | 0.06 | 1° | 2½ | 362 | 638 | 875 | 1320 |
| | 4 | | | 7.94 | 0.10 | | 2 | 244 | 500 | 610 | 1260 |
| | 5 | | 7.94 | | 0.06 | 2° | 2½ | 497 | 665 | 810 | 1410 |
| | 6 | | | 7.89 | 0.11 | | 3¼ | 555 | 640 | 840 | 1500 |
| | 7 | | 7.94 | | 0.06 | Point blank. | 2½ | 250 | 620 | 1120 | 1400 |
| | 8 | | | 7.94 | 0.06 | | 2 | 262 | 608 | 960 | 1435 |
| | 9 | 5 8 | 7.92 | | 0.08 | 1° | 2½ | 444 | 902 | | 1710 |
| | 10 | | | 7.92 | 0.08 | | 2 | 475 | 1050 | | 1310 |
| | 11 | | 7.95 | | 0.05 | 2° | 2½ | 620 | 815 | 1100 | 1550 |
| | 12 | | | 7.91 | 0.09 | | 3 | 760 | 925 | | 1490 |
| | 13 | | | 7.90 | 1.10 | 3° | 3½ | 818 | 865 | | 1620 |
| 28th July | 14 | 6 0 | 7.91 | | 0.09 | P. B. | | 260 | 573 | 850 | 1520 |
| | 15 | | 7.92 | | 0.08 | 1° | | 471 | 900 | 1000 | 1315 |
| | 16 | | 7.95 | | 0.05 | 2° | | 662 | 1200 | 1300 | 1460 |

A 10 inch braſs howitzer, weighing 23 cwt. 3 qr. and 7 lb. fired horizontally, or point blank, with five pounds of powder, had its firſt graze at the diſtance of 112 yards, with one degree of elevation at 200 yards, with two degrees of elevation at 300 yards, and with three degrees of elevation at 414 yards.

When fired horizontally, or point blank, with ſix pounds of powder, it had its firſt graze at the diſtance of 80 yards, with one degree of elevation at 225 yards, with two degrees of elevation at 290 yards, and with three degrees of elevation at 445 yards.

An eight-inch braſs howitzer fired horizontally or point blank with two pounds of powder, had its firſt graze at the diſtance of 119 yards, with one degree of elevation at 195 yards, with two degrees of elevation at 200 yards, and with three degrees of elevation at 246 yards.

When fired horizontally or point blank with three pounds of powder, it had its firſt graze at the diſtance of 125 yards, with one degree of elevation at 208 yards, with two degrees of elevation at 278 yards, and with three degrees of elevation at 336 yards.

The recoil of the ten inch howitzer fired horizontally or point blank was 11 feet with 5 pounds of powder, and 13½ feet with 6 pounds of powder.

The recoil of the eight-inch howitzer fired horizontally or point blank with 2 pounds of powder was 10 feet, and with 3 pounds of powder 16 feet.

An iron 24 pounder, of the late lord Howe's conſtruction, fired with ſix pounds of powder and one degree of elevation, had its firſt graze, on a medium of four trials, at the diſtance of 471½ yards; and with five pounds of powder and the ſame elevation, on a medium of two trials, at 507½ yards.

A 32 pounder iron gun fired horizontally or point blank with high ſhot and four pounds of powder, had its firſt graze at the diſtance of 200 yards, with the ſame ſhot, charge, and one degree of elevation at 465 yards, and with two degrees of elevation at 675 yards.

And the ſame gun with the ſame charge, point blank, and the ſame elevations, but with low ſhot, gave the firſt grazes at 220, 395, and 662 yards reſpectively.

Theſe experiments clearly prove the great ſuperiority of the ſmaſher, or 68 pounder carronade, over not only the eight-inch howitzer of the ſame bore with it, but alſo over the ten-inch howitzer, which is the largeſt in our ſervice, and has its bore to that of the ſmaſher as 100 to 64, and the diameter thereof to that of the ſmaſher as 10 to 8.

They alſo ſhew, that it is nearly on a footing with the common iron 24 and 32 pounder, as to its firſt grazing diſtance, which is a material point in ſea-ſervice, and has greatly the advantage of them, particularly in cloſe combat, by the ſize of the holes which its ſhot make in the ſides of a ſhip, and from their likewiſe paſſing through the ſame with leſs velocity. For a ſhot, eſpecially if its diameter be but ſmall, that paſſes very quickly through a ſhip's ſide, makes only a clean hole, whereas one of a large diameter, that penetrates it with leſs celerity, makes a rough and ragged one, by tearing and ſplintering the planks and timbers. And it is well known that ſhot fired at ſea with a greater elevation than five degrees, are of no uſe whatever, unleſs they hit the object they are fired at before they meet the ſurface of the water, as they never graze or riſe again from it when fired with ſo great an elevation. It may be objected to the uſe of ſmaſhers on board a ſhip, that their ſhot are too heavy to be eaſily handled and put into the gun. This objection holds good againſt the uſe of them with their ſhot in its ſolid form, which of all others is the moſt unfit for ſea engagements. It vaniſhes, however, when it is conſidered that the weight of its ſhot may be reduced by leaving it hollow, or with a core in the centre, from 68 pounds down to 42 pounds and under, and ſtill retain thickneſs and ſtrength of metal enough for penetrating the ſide of any ſhip whatever. This fact has been eſtabliſhed beyond even the poſſibility of controverſy by ſome experiments that were made at Woolwich in 1781, in the preſence of general Melville who propoſed them, and his grace of Richmond, then maſter-general of the ordnance. For in July that year Mr. Gaſcoigne ſent from Carron to Woolwich for that purpoſe ſix hollow ſmaſher, or 68 pounder carronade ſhot, weighing from 55 pounds to 55½ pounds, ſix others reduced in weight from 68 to from 50 to 50½ pounds, ſix others weighing only from 45¼ pounds to about 46½, and ſix reduced down from 68 pounds ſo low as from about 43 pounds to 40. The lighteſt of theſe were fired into a bulk-head, as thick as the ſide of a firſt rate, from a ſuitable diſtance. They eaſily penetrated it, and one of them, after penetrating, ſtriking againſt an oak poſt or ſtud, nine inches ſquare, tore, ſhattered, and ſplintered it almoſt to pieces. The maſter-general, after viewing its effects, ſaid it would have been a terrible ſhot againſt a ſhip, and very juſtly obſerved, that as the lighteſt of theſe hollow ſhot were found to anſwer perfectly, it was unneceſſary to try the heavier ones. We are convinced, indeed, that the ſhot of a ſmaſher, or 68 pounder carronade might, by means of concentric cavities, be reduced down to the weight of 32 pounds, and ſtill retain ſtrength and thickneſs of metal ſufficient for penetrating the ſide of any ſhip. In this ſtate they would be much more eaſily handled than a common 32 pounder ſhot, having a larger diameter and a much larger ſurface. Theſe experiments ſhew, that they are ſufficiently ſtrong for that purpoſe when brought down to within eight pounds of that weight. And if, in addition to this fact, it be alſo taken into conſideration, that a multitude of experiments made with ſmaſhers, or 68 pounder carronades, concurred in eſtabliſhing this point, that when fired either point blank or with any elevation not exceeding two degrees, the hollow ſhot went farther than the ſolid ſhot before they met the ſurface either of the ground or water, it muſt readily be allowed, that they are peculiarly calculated for naval combats. But were theſe hollow ſhot to be fired as ſhells, with a ſufficiency of powder in their cavities for burſting them, they would be truly terrible and tremendous to ſhipping in a ſea-fight. It may be alleged, that the enemy would ſoon alſo get into the uſe of them as ſhells. It is true that after a time he might: but whoever ſhall make this uſe of them in a great naval action, he will certainly derive infinite advantages from it. And we truſt our enemies will not be the firſt to make ſuch an application of this very uſeful piece of ordnance.

*Of the poſition of the vent in cannon, and other pieces of ordnance.*

As the inflammation of fired gunpowder is almoſt inſtantaneous, it is natural to conclude, that the impulſive force of a given charge of it is not, *cæteris paribus*, ſenſibly altered by its being fired in any particular part or point of it; and of courſe, that neither the initial velocity nor range of a ball is ſenſibly affected by the poſition of the vent. This is a fact that has been ſufficiently eſtabliſhed by experiments made at Woolwich, by the learned Dr. Hutton, and ſeveral reſpectable officers of artillery, under the authority and direction of the board of ordnance.

The vent is vulgarly called the *touch-hole;* and is the narrow cylinder or opening through which fire is conveyed from the outſide of the piece to the powder that compoſes the charge.

Formerly both theoriſts and practitioners differed widely from one another in regard to the proper poſition of it. It has been cuſtomary to place it from one quarter of an inch to half an inch from the bottom of the chamber or bore, and ſometimes a whole inch. An idea prevailed, that if the vent were directly oppoſite to the middle of the charge, the powder would be inflamed in leſs time than in any other place, and that the exploſion would of conſequence produce a greater initial velocity and range. This erroneous concluſion was founded on the ſuppoſition that if a tube were filled with powder and lighted in the centre, the powder would be burnt in half the time that it would if lighted at either end, and on inadvertence to this circumſtance, that the inflammation of fired gunpowder is ſo nearly inſtantaneous, that no ſenſible difference as to the time in which it takes place can ariſe, from the firing of a charge in the centre in preference to any other part of it. In order to determine this point, Frederic the Great, or the Second, of Pruſſia, ordered a light three pounder to be caſt with three ſhifting vents, one at the centre of the charge, one at the bottom of the bore, and the other at an equal diſtance from the bottom and centre one; ſo that when one was uſed the other two might be ſtopped up. The gun weighed 2 cwt. 1 qr. 20 lb. Its length was three feet three inches, and the bottom of the bore, inſtead of being rounded, was quite flat. It was loaded each time with one quarter of the ſhot's weight of powder. It was found that when the loweſt or bottom-vent was uſed, the ranges were rather the greateſt, and that they were ſomewhat leſs as the vent was more and more diſtant from the bottom. The differences, however, were ſo ſmall, that they might very eaſily have been produced by the leaſt inaccuracy in making the experiments, or by the gun's being a little more heated at the time of making one than another, and but little reliance can be placed on them.

*On the form or figure of the chamber of a piece of ordnance.*

The chamber of a gun, mortar, or howitzer, is the cavity at the bottom of the bore, that receives the charge of powder, and communicates with the vent, through which the fire of the priming is communicated to the ſame. There are but few guns that have chambers, except ſome of the largeſt ſizes and calibers, as it has been found by experience, that they have ſcarce any ſenſible influence or effect on the velocity of the ſhot in ſmall and middle ſized ones.

Various have been the opinions of authors and artilleriſts reſpecting the forms or figures of chambers; and different nations have had them conſtructed very differently. The Spaniards have been in the practice of uſing chiefly the ſpherical chamber for their mortars; the French, Germans, and Dutch, the conic, cylindric, and the concave, or bottled, or the *chambre à poire*, or pear chamber. The Portugueſe have made uſe of the parabolic form, which was firſt ſuggeſted or invented by count de Lippe Buckeburg. And the Engliſh have been in the habit of making theirs in the form of a fruſtum of a cone.

The cylindric chamber is that which is equally large every where, or has the diameter of its bore in every place or part of it the ſame. This is found to be by far the moſt commodious form for great guns or cannon of a large caliber, and is indeed almoſt the only kind of chamber that is made uſe of in ſuch pieces of ordnance.

The ſpheric, or ſpherical chamber, as its very name imports, is that which is made in the form of a ſphere, or bullet, or at leaſt very nearly ſo. This ſort of chamber for guns, or cannon, was invented towards the cloſe of the ſeventeenth century. The object of this invention was to throw balls and ſhot with as much force from ſhort, light, and eaſily tranſportable cannon as that with which they were thrown from the long, cumberſome, and ponderous pieces then in uſe. It was found by experience, that the advantages expected and propoſed were obtained by this alteration in the interior arrangement of the bores of guns, or by the conſtruction of ſuch pieces. For though they were made a good deal ſhorter than thoſe formerly made uſe of, and were fired with a ſmaller quantity of powder, they produced the ſame effects. But as it was difficult to wipe, or clean out the interior cavities of ſuch chambers after the cannon were fired, ſome fire frequently remained in them, which ſometimes occaſioned the loſs of arms to the cannoniers, or the perſons who were employed to ſerve and manage them. Beſides theſe inconveniences, they were attended with others; for the inflamed powder, before it quitted the chamber, acted in all directions with ſuch force and impetuoſity, that their carriages were ſoon either broken or rendered unſerviceable. They recoiled very much and fired with little certainty. For theſe reaſons, guns with ſpherical chambers were totally laid aſide; and ſuch of them as were found in the arſenals and fortreſſes in France were caſt anew into cannon, having cylindric bores every where equal and alike. The guns commonly made uſe of at preſent have no chambers, except ſome of the largeſt calibers. And even theſe have their chambers cylindrical.

The very ingenious Mr. Robins in the ſcholium to the ninth propoſition in his new principles of gunnery aſſerts, that what ſome authors have advanced in regard to the advantages of having particular forms for the chambers of mortars and cannon, is altogether inconcluſive, and founded on erroneous conceptions of the action of fired gun-powder. The learned Mr. Euler, however, in his commentary and remarks on Mr. Robins's treatiſe, contends for the ſpherical chamber as the beſt. He admits that Mr. Robins's concluſion would be true did the inflammation of the powder take place in an inſtant. He allows, that the force of the powder on the ſuppoſition of its firing inſtantaneouſly would be the ſame, whatever be the form of the ſpace behind the ſhot or ſhell that contains it, and whether this ſpace be either wholly or only partly filled with it. He alſo allows, that its impelling power after the ball or ſhell is once in motion, will in this caſe be the ſame, as well as its firſt impulſive force, whatever be the form of the chamber; that if no better reaſon than the increaſing of the impelling force can be aſſigned for changing the figures of chambers, either in guns or mortars, from what they uſually are, all propoſals for altering them, except ſuch as tend to render them more convenient and commodious, ought to be rejected without further examination.

Leaning, however, towards an opinion of profeſſor Bernoulli, that the elaſtic force of the fluid generated by the exploſion of gunpowder, is nearly ten thouſand times greater than the preſſure of the atmoſphere, he ſuppoſes the inflammation of gunpowder to be gradual inſtead of being almoſt inſtantaneous, and therefore concludes, that chambers may be improved by changing their figures, and that the ſpherical form is the beſt of any, as being capable of holding the greateſt quantity of powder under the ſame circumference, as better calculated than any other for keeping the grains near, or contiguous to one another, and for quickening, or accelerating the exploſion. The experiments which he appeals to, and produces for eſtabliſhing this hypotheſis, are altogether inconcluſive, and muſt have been conducted with great inaccuracy, or inattention to ſome circumſtances that were connected with, and influenced them. They were made in preſence of him, Mr. Bernoulli, and ſeveral other members of the academy, at St. Peterſburg, by general Gunther in 1728. And from two of them he infers, that a ball fired vertically with eight ounces of powder from a piece, which had the length of its cylinder equal to $7\frac{7}{10}$ Engliſh feet, iſſued out of it with thrice the velocity which it iſſued with, fired with the ſame quantity of powder from the ſame piece, when the length of its cylinder was reduced to ſix feet, by ſawing one foot and ſeven-tenths of a foot off from it. Taking this inference too precipitately for granted, he obſerves, by way of proving the great inaccuracy of Mr. Robins's poſition, "that all the powder of the charge is fired and converted into an elaſtic fluid before the bullet is ſenſibly moved from its place;" that according to this theory, the velocity inſtead of being thrice as great would have differed from the other ſcarce perceptibly, and therefore moſt erroneouſly concludes, that the greateſt part of the powder muſt have fired whilſt the ball moved through the laſt foot and a half of the bore of the piece, before it was reduced in length. Now, the quadruplicate ratio of $7 + \frac{7}{10}$ to 6, or of 77 to 60, is that of 35,153,041 to 12,960,000, which is conſiderably leſs than the ratio of three to one. Mr. Euler then makes the velocities of the ſame, or equal ſhot fired with the ſame charge of powder from bores of the ſame diameter, but of unequal lengths in ratios to one another, reſpectively greater than the quadruplicate ratios of theſe lengths. We know, however, from experiments made with inconteſtable accuracy at Woolwich on Mr. Robins's plan improved, that theſe velocities are in ratios ſomewhat leſs than the ſubduplicate ratios of the lengths of the bore, but in ratios ſomewhat greater than the ſubtriplicate ratios of the ſame lengths, and nearly indeed in mean or middle ratios between the two. Mr. Euler's making the ratios of theſe velocities ten times as great as they really are, proves incontrovertibly both his theoretical reaſonings, and his experimental inferences againſt the poſition of the almoſt inſtantaneous firing of gunpowder, and in ſupport of the hypotheſis of its firing gradually in the way he deſcribes, to be completely erroneous.

The objections he endeavours to draw from rifled pieces againſt the truth of Mr. Robins's ſeventh propoſition, being inconſiſtent with facts and experiments, are likewiſe fallacious and inconcluſive.

A conic or conical chamber is that which is in the form of a fruſtum of a cone, with its bottom ſometimes circular, but generally hemiſpherical, or nearly ſo. We have been in the habit of uſing ſuch a form for chambers with the greateſt diameter of each at its mouth, or entrance, contrary to reaſon and principles, which point out the advantage and propriety of having the impulſe of the inflamed powder made on the ſhell or bullet as near to its axis, or to that of the bore of the piece as poſſible.

Count Buckeburg propoſed the parabolic form, or that of a paraboloid, or parabolic conoid, which has been made uſe of by the Portugueſe as the beſt, erroneouſly ſuppoſing, that were the fire introduced to the focus, the rays of lighted powder would by the nature of the figure be reflected into parallel directions like the rays of light.

A concave chamber is that which has its mouth or entrance narrower than its inſide cavity. It may be ſpherical, ſpheroidal, in the form of a pear, called by the French, une chambre a poire, in the ſhape of an egg, of a bottle, and a variety of other forms.

Much more, however, depends on the entrance of the chamber, than on its form or figure. The entrance ought to be directly oppoſite to the middle of the ball, or ſhell, and to have no greater width than what is neceſſary for cleaning out the chamber, which ſhould contain no more powder than the greateſt charge proper for ſervice, to prevent as much as poſſible any vacancies being left between it and the ſhell or bullet. As the cylindric is the moſt convenient form for being eaſily cleaned out, it ought to be preferred to others on account of its ſimplicity. For, in moſt of the affairs of life, and more eſpecially in thoſe of war, of all things of the ſame kind, the ſimpleſt are the moſt commodious.

### *Of the poſition of the charge of powder.*

Every experiment that has been made reſpecting the poſition of the charge of powder, proves the advantage of its lying cloſe to the ball or ſhell. Among others, the following are well deſerving of notice.

The ingenious general Deſaguliers in 1753, and Mr. Muller, then profeſſor of fortification in the Royal Military Academy at Woolwich, made a number, repeatedly with a ſmall mortar, which had ſeveral ſhifting chambers.

Into a narrow cylindric chamber of about four inches long, and holding about twelve grains of powder, there was put a thin cartridge filled with ſix grains. This cartridge was placed in the chamber in ſuch a manner as to lie cloſe to the ſhell, leaving a vacuity or empty ſpace between it and the bottom of the chamber, and was fired by means of a quick match, introduced through the vent. A cartridge of the ſame ſize, and containing the ſame quantity of powder, was then put into the ſame chamber, but placed at the bottom of it, leaving an empty ſpace between the powder and the ſhell, and was fired in like manner. Laſtly, an equal cartridge with the ſame charge of powder was placed in the middle of the ſame chamber, or equally diſtant from the bottom thereof and from the ſhell, and was fired in the ſame way. Theſe experiments were frequently repeated, and it was found, on every repetition of them, that in the firſt caſe, the ſhell was thrown nearly twice as far as in the ſecond, and that the diſtance it went to in the third caſe, was about an arithmetical mean between its ranges in the firſt and ſecond.

They alſo found, that when the ſame quantity of powder was put looſe into the ſame mortar, and a piece of writing paper laid on it, the ſhell was thrown conſiderably farther than it was by the ſame charge of looſe powder without the paper.

They likewiſe found, that three cylindric ſhifting chambers of different lengths, but holding the ſame quantity of powder, produced, when filled, equal ranges, but that when they were not quite filled, the longeſt gave the greateſt range.

They alſo tried ſome experiments with two chambers in the form of a fruſtum of a cone, one of which had its largeſt diameter at the bottom, and the ſmalleſt at the entrance, and the other its ſmalleſt diameter at the bottom and the largeſt at the entrance, and always found, that the firſt of theſe with the ſame charge of powder, threw the ſhell farther than the ſecond.

General Deſaguliers alſo found by experiments, that grained and mealed powder were about equally ſtrong when in good order and condition ; but on putting a ſmall phial filled with water into the chamber amongſt the powder, he obſerved the ſtrength of the charge to be conſiderably increaſed.

### *Of the Windage.*

The windage of a gun, mortar, or howitzer, is the difference between the diameter of the bore and the diameter of the ſhot or ſhell. We have been in the practice and ſtill are, of making it equal to a twentieth part of the diameter of the ſhot in every gun except the carronades. The Dutch have commonly made their windage nearly the ſame as ours. The French have been in the habit of making theirs a twenty-ſixth part of the diameter of the ſhot. And the Pruſſians make the diameter of the bore of the gun to the diameter of the ſhot as 25 to 24. This is a moſt convenient proportion. But it makes the windage much greater than it ought to be. There ſeems to be no very good reaſon, indeed, for making the windage bear any given or determinate ratio to the diameter of the ſhot, ſince if the bores be true, the ſame windage that anſwers for a ſmall ſhot will be ſufficient, or nearly ſo, for a large one. The ſmaller the windage, the greater and truer will be the flight of the ſhot or ſhells ; for when it is great, they are apt to injure the bore by bouncing from ſide to ſide, and alſo, at leaving it, to receive from this kind of motion a ſort of cant or deflection from the line of their direction. With our preſent windage for guns, except carronades, from one fourth to one half of the charge is loſt and rendered uſeleſs. Short guns, indeed, with ſmall charges of powder and a very ſmall degree of windage will be more uſeful and ſerviceable than guns twice as long with double charges of powder and a large windage. We will not undertake to determine preciſely what the windage ought to be. But we are inclined to think, that if the ſhot and ſhells be caſt in moulds having exactly the diameters of the bores of the different pieces of ordnances for which they are intended, the retreat or ſhrinking of the metal in cooling, will for both leave a ſufficiency of windage. The windage we have been in the practice of allowing for ſhells of all ſizes, is a quarter of an inch, which is prepoſterouſly large and beyond all due proportion. Were it reduced even to a third or fourth part of that quantity it would be ſufficient.

In our common 12 pounder, 18 pounder, 24 pounder, 32 pounder, and 42 pounder, there is allowed reſpectively a windage of 0.22 inches; 0.252 inches; 0.277 inches; 0.305 inches; and 0.334 inches. But in our 12 pounder, 18 pounder, 24 pounder, 32 pounder, and 42 pounder carronades, the windage is only about 0.097 inches; 0.1 inches; 0.123 inches; 0.145 inches; and 0.166 inches reſpectively, which gives them a great advantage and ſaves much powder.

*Of the caſting and boring of cannon.*

The caſting of a gun in its ſtrict and limited ſenſe is, the running of any ſort of metal or mixture of metals, of which the gun is intended to conſiſt or be compoſed, into a mould prepared for receiving the ſame, and having its inſide of ſuch a ſhape, as to form the outſide of the gun. But the caſting of cannon in its more general acceptation, includes every thing, and operation preparatory to, neceſſary for, and connected with the founding of them, ſuch as the making of the models, moulds, &c. &c. for all which ſee the article FOUNDERY.

Cannon, as we have already obſerved, were originally made of bars of iron fitted together lengthwiſe, or of ſheets of iron rolled up and faſtened together, and hooped with iron rings. They were ponderous, clumſy, cumbrous, in a great meaſure unmanageable, and could not be tranſported from one place to another but with great difficulty and labour. They were chiefly employed for throwing large ſtones like the machines of the ancients, which they ſucceeded. Theſe were gradually ſupplanted by braſs cannon, which had much ſmaller calibers, and threw iron bullets inſtead of ſtones, but produced in a few hours greater effects than the others could in many days. Theſe guns were firſt caſt of a mixture of copper and tin, called gun-metal from that circumſtance, which continued to be employed for that purpoſe for a long time before caſt iron was made uſe of. In the courſe of time, however, as the uſe of artillery became more general, and the number of cannon greatly increaſed, iron guns were invented by way of leſſening the expence. An idea, however, that prevailed of their being very liable to burſt when much heated by firing, retarded the general introduction of them into ſervice, and was the cauſe of their being made much heavier than braſs guns of the ſame calibers. And this apprehenſion ſtrengthened by ſome accidents of the kind that took place either through improper management, or the careleſſneſs and unſkilfulneſs of ſome founders, has militated againſt the general uſe of them even down to the preſent time. When caſt, however, with iron obtained from good virgin ore, to which the founders can give any degree almoſt of malleability, of which the Carron company and others have afforded many proofs and ſpecimens, they reſiſt burſting as much as braſs cannon, and poſſeſs great advantages over them, as theſe are compoſed of ingredients, that melt with different degrees of heat, and are thereby not only liable to be ſoon injured when much heated, but alſo to be rendered in a ſhort time totally unſerviceable by quick and continued firing.

Till about 40 years ago, cannons were caſt with a cylindric cavity in each of them, having nearly the ſame diameter with the intended caliber of the piece, which was afterwards enlarged to the proper ſize by machines, one of theſe is repreſented. See *Cannon, fig.* 13. Two caſt iron bars, A A, were confined in a vertical poſition, by being ſcrewed to the four beams, B, B, B, B; between theſe bars a caſt-iron frame, C C, was at liberty to ſlide; to which frame the gun, D D, was fixed by a band, *c*, acroſs the baſe ring, fixed by two ſcrews, another ſimilar band, *e*, fixed acroſs the chace, and two ſmaller ones, *a a*, ſcrewed acroſs the trunnions, to prevent the piece from turning round by the action of the drill-bar, E; a tin or copper pan, F, was fixed on the drill-bar for containing the chips of metal ſeparated from the piece by the borer on the top of the drill-bar. After the gun was prepared by boring, by cutting off the cap or piece of metal left at the muzzle with a ſaw, it was brought under the frame, C C. The two blocks of pulleys, G G, were unhooked from the frame (which was let down and reſted on the bottom of the bars A A), let down and faſtened to the gun below, by chains, to hoiſt it up into the frame, C C, where it was fixed by the ſcrews; the pulleys were then hooked into the top of the frame, to raiſe it with the gun, high enough to introduce the borer; the pulleys were afterwards ſlackened, and the drill-bar, which worked in a ſocket in the ground, ſet in motion by horſes or otherwiſe, the gun being kept to the work by its own weight; when the gun was bored far enough, it was prevented from deſcending any farther by the block, H, which was adjuſtable by ſcrews, to the proper length of the bore; when the piece was bored, the pullies were again uſed to ſupport it, while it was detached from the frame, and afterwards to lower it down.

Owing to the unequal contraction of the metal between the core and the outſide of the mould, guns caſt hollow were always more or leſs ſpongy, and numberleſs cavities were formed round the core, ſome of which were too deep for the borer to cut out; this and other reaſons have occaſioned the old method to be laid aſide, and guns are now univerſally caſt ſolid. The old machines alſo, where the gun was fixed, not being found to bore always in the right direction, ſeveral new machines have been ſubſtituted, ſome of which are repreſented in *figs.* 14, 15, 16 and 17.

*Fig.* 14. is a machine uſed at the *Garratt Iron Works*. In this, contrary to the former one, the gun, B, is turned by the ſhaft, A, moved by a water-wheel; the drill-bar, E, is advanced by a weight, C, acting on a bent lever, whoſe fulcrum is F; when the weight, C, has deſcended to the floor, or nearly, it muſt be lifted up, and the point, G, then acting as a fulcrum, the rod, H, will be drawn forwards, one or two teeth of the rack, I, and the weight will be ready to act again as before. The gun, B, is fixed by a ſquare lump caſt on the end of the caſcable, into a coupling box, and wedged up, and the chace of the gun moves in a collar. The only guns caſt at theſe works are carronades.

In *fig.* 15. the gun is fixed in the ſame manner as *figs.* 14 and 17, except that the box, K, is fitted by ſcrews inſtead of wedges, the drill-bar, E, reſts on a block, F, juſt before it enters the gun, and the other end is fixed to a carriage, G, moving on wheels, *a a*, to diminiſh friction; to the bottom of the carriage, a rack, I, is fixed, working into a pinion, L, the rack is kept to the pinion by a roller, *b*; on the end of the axis of the pinion a capſtan-head is fixed, with mortiſe-holes in it, to contain one end of an iron bar, *d*, while the other is loaded with a weight, C, for advancing the borer, and is ſhifted into a freſh hole as often as the weight deſcends to the ground.

In the machine, *fig.* 16. the muzzle of the gun can be elevated or depreſſed, to ſuit guns of different bores, by ſcrews, *c*, between the two plates, *a b*; the plates can alſo be moved farther from or nearer to the coupling box, by a ſcrew, *d*, to ſuit guns of different lengths; the two blocks, F G, between which the rack, I, is faſtened, are fixed down to the beams, A, B; the pinion, L, is faſtened to the block, M, which can ſlide between the beams, A, B, and has wheels above and below the beams, to diminiſh the friction; to this block, one end of the drill-bar, E, is fixed; near the other, it reſts on the block, F; on the end of the axis of the pinion is a wheel, *f*, with teeth parallel to its axis, on the end of which axis the bar, *g*, is looſely fitted; to the other end of the bar the weight, *c*, is hung; when the weight is down, the bar muſt be ſlid along the axis, far enough to be lifted up clear of the teeth, and is to be puſhed back into its place again, above the next tooth.

The machine at the *Royal Arſenal* at Woolwich is ſhewn in *fig.* 17. The two ſupports of the gun, A B, are of ſolid braſs, and well poliſhed; the drill-bar, E, ſlides on a ſtrong table, with the rack, I, at its end, the axis of the pinion, *o*, is upright, and has a wheel, *d*, at its top, working into an endleſs ſcrew, *e*, which has a wheel, *f*, upon the end of the ſpindle, with handles on its circumference, for two men to turn it round by; on one of the ſpokes, *g*, a common handle is fixed, to turn the wheel back, for withdrawing the drill-bar; the pinion, endleſs ſcrew, and wheel, *d*, are incloſed in a braſs box, which ſupports their axes. We think this machine might be improved, by having the pinion horizontal, and applying a weight to it, as before deſcribed in the other machines.

Cannons are always caſt with a large cap, or piece of ſpare metal, at the mouth; in the old guns, which were caſt hollow, this piece was cut off by a ſaw; in the ſolid guns, at the Garrat iron works, it is cut off by a machine, repreſented in *fig.* 20. On the lathe for turning the outſide of the gun, a caſt-iron frame, A A, is fixed, for ſupporting ſteadily the chiſel, *b*; between the end of the chiſel and the frame, a wedge, *d*, is put in, which a man continually drives with a hammer, to advance the chiſel, and turn a notch in the gun; when it is cut about 1½ inch deep, it is broken off by hammers. We think a ſcrew would be judiciouſly ſubſtituted for the wedge.

After cannons are bored, and their outſides turned, the touch-holes are drilled by inſtruments, *figs.* 18 and 19.; in *fig.* 18. A A A is a frame of wood, mounted on wheels, B, at one end, for convenience of moving when it is to be uſed; the frame is wheeled cloſe to the gun, D, laid on two blocks of wood, F F, high enough to take the wheels off the ground, and prevent its running back; the drill, E, and its bow, G, are then to be fixed, between the place of the touch-hole of the gun and the block, H; which block is advanced by one arm, I, of a bent lever, by means of the weight, C, hung on the other arm, *d*.

In *fig.* 19. A is a beam of the building, through which a ſcrew, B, works; the lower end of this ſcrew is hollow for ſome inches, to receive a ſmall part, *c*, of the drill, C; on the lower end of the drill a leaden wheel, F, is fixed, to act as a fly; to the upper part, *c*, of the drill, the ends of two ſtrong catguts are faſtened, and after being twiſted round it a few times, the other ends are tied to a handle, E E, at *e* and *f*. To uſe this machine, a gun is brought and laid under the beam, A, the drill ſet up with the point, *c*, in the end of the ſcrew, B, which muſt be ſcrewed down till the point, *c*, touches the bottom of the hole in the ſcrew, to prevent the point of the drill from ſlipping away from the intended touch-hole; the workman muſt then wind up the cords, by turning the wheel, F; when the handle, E, is in the poſition of the figure, he muſt force it down quickly, which will turn the drill round; when the catguts are untwiſted, he muſt let the handle riſe, but ſtill hold it, to prevent its turning round with the drill, which will continue to turn by the momentum of the wheel, F, and wind the handle, E, to the ſame height as in the figure, but with the cords in a contrary direction. The man muſt then force the handle down again as before.

*Fig.* 21. repreſents the different kinds of borers; A is the borer uſed for ſolid guns, and *a* a ſection of the ſame; B and C are different views of the borer for boring hollow guns the firſt time, and D and E are two different borers for finiſhing either kind of guns.

The following are the dimenſions, both of the iron and braſs guns, which the French uſe at preſent in their ſea and land ſervice, and have made uſe of ever ſince their revolution.

Table of the dimenſions of French iron cannon for ſea ſervice taken parallel to their axes.

| Dimenſions. | 36 Pounder. | | | | | 24 Pounder. | | | | | 18 Pounder. | | | | | 12 Pounder. | | | | | 8 Pounder long. | | | | | 8 Pounder ſhort. | | | | | 6 Pounder long. | | | | | 6 Pounder ſhort. | | | | | 4 Pounder long. | | | | | 4 Pounder ſhort. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. |
| a b | 0 | 9 | 9 | 0 | 0 | 0 | 8 | 6 | 0 | 0 | 0 | 7 | 9 | 0 | 0 | 0 | 6 | 9 | 4 | 0 | 0 | 5 | 11 | 2 | 0 | 0 | 5 | 11 | 2 | 0 | 0 | 5 | 4 | 5 | 0 | 0 | 5 | 4 | 5 | 0 | 0 | 4 | 8 | 0 | 0 | 0 | 4 | 8 | 0 | 0 |
| b c | 0 | 3 | 2 | 0 | 0 | 0 | 2 | 9 | 0 | 0 | 0 | 2 | 6 | 0 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 1 | 10 | 10 | 0 | 0 | 1 | 10 | 10 | 0 | 0 | 1 | 8 | 7 | 0 | 0 | 1 | 8 | 7 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 1 | 4 | 0 | 0 |
| c d | 0 | 2 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 9 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 3 | 0 | 0 |
| d e | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 2 | 6 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 9 | 0 | 0 | 0 | 1 | 9 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 1 | 6 | 0 |
| c f | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 6 | 0 | 0 |
| f g | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 11 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 0 |
| g h | 0 | 0 | 10 | 6 | 0 | 0 | 0 | 10 | 6 | 0 | 0 | 0 | 10 | 6 | 0 | 0 | 0 | 10 | 6 | 0 | 0 | 0 | 10 | 6 | 0 | 0 | 0 | 10 | 6 | 0 | 0 | 0 | 10 | 6 | 0 | 0 | 0 | 10 | 6 | 0 | 0 | 0 | 10 | 6 | 0 | 0 | 0 | 10 | 6 | 0 |
| h i | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| i k | 0 | 1 | 6 | 6 | 0 | 0 | 1 | 1 | 6 | 0 | 0 | 1 | 4 | 6 | 0 | 0 | 1 | 0 | 6 | 0 | 0 | 0 | 8 | 6 | 0 | 0 | 0 | 8 | 6 | 0 | 0 | 0 | 5 | 6 | 0 | 0 | 0 | 5 | 6 | 0 | 0 | 0 | 3 | 6 | 0 | 0 | 0 | 3 | 6 | 0 |
| k l | 0 | 1 | 7 | 4 | ½ | 0 | 1 | 4 | 10 | ¾ | 0 | 1 | 3 | 4 | ½ | 0 | 1 | 1 | 5 | ¼ | 0 | 0 | 11 | 9 | 0 | 0 | 0 | 11 | 9 | 0 | 0 | 0 | 10 | 8 | 0 | 0 | 0 | 10 | 8 | 0 | 0 | 0 | 9 | 10 | 0 | 0 | 0 | 9 | 10 | 0 |
| l m | 0 | 0 | 0 | 7 | ½ | 0 | 0 | 8 | 1 | ¼ | 0 | 0 | 6 | 7 | ½ | 0 | 1 | 0 | 6 | ¾ | 0 | 1 | 6 | 3 | 0 | 0 | 1 | 6 | 3 | 0 | 0 | 1 | 10 | 4 | 0 | 0 | 1 | 10 | 4 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 3 | 0 | 0 |
| m n | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 0 |
| n o | 0 | 0 | 5 | 6 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 4 | 6 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 3 | 6 | 0 | 0 | 0 | 3 | 6 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 2 | 6 | 0 | 0 | 0 | 2 | 6 | 0 |
| o p | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 0 |
| p q | 0 | 0 | 5 | 6 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 4 | 6 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 3 | 6 | 0 | 0 | 0 | 3 | 6 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 2 | 6 | 0 | 0 | 0 | 2 | 6 | 0 |
| q r | 1 | 1 | 3 | 6 | 0 | 1 | 0 | 7 | 6 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| r ſ | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 2 | 0 | 10 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 9 | 10 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 1 | 7 | 7 | 8 | 0 | 1 | 6 | 6 | 0 | 0 | 1 | 3 | 6 | 0 | 0 |
| ſ t | 1 | 1 | 7 | 6 | 0 | 1 | 1 | 3 | 11 | 0 | 1 | 0 | 8 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 5 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| t u | 0 | 1 | 9 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 10 | 0 | 0 |
| u v | 0 | 6 | 7 | 6 | 0 | 0 | 5 | 9 | 7 | 0 | 0 | 5 | 3 | 6 | 0 | 0 | 4 | 7 | 9 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 3 | 8 | 8 | 0 | 0 | 3 | 8 | 8 | 0 | 0 | 3 | 3 | 4 | 0 | 0 | 3 | 3 | 4 | 0 |
| v x | 0 | 1 | 9 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 10 | 0 | 0 |
| x y | 0 | 1 | 1 | 6 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 7 | 0 | 0 | 0 | 1 | 7 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| y z | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 6 | 0 | 0 |
| z a′ | 3 | 5 | 4 | 6 | 0 | 3 | 2 | 11 | 6 | 0 | 3 | 0 | 10 | 0 | 0 | 2 | 10 | 6 | 0 | 0 | 3 | 1 | 1 | 0 | 0 | 2 | 7 | 6 | 0 | 0 | 2 | 8 | 5 | 0 | 0 | 2 | 4 | 6 | 0 | 0 | 2 | 1 | 2 | 3 | 0 | 1 | 8 | 2 | 8 | 0 |
| a′ b′ | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 8 | 6 | 0 | 0 | 0 | 8 | 6 | 0 |
| b′ c′ | 0 | 11 | 9 | 2 | 0 | 0 | 11 | 2 | 7 | 0 | 0 | 10 | 6 | 8 | 0 | 0 | 10 | 8 | 7 | 0 | 0 | 10 | 11 | 3 | 0 | 0 | 9 | 1 | 3 | 0 | 0 | 9 | 7 | 4 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 7 | 3 | 6 | 0 | 0 | 5 | 11 | 3 | 0 |
| c′ d′ | 0 | 0 | 4 | 10 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 0 | 3 | 10 | 0 | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 2 | 8 | 0 | 0 | 0 | 2 | 8 | 0 | 0 | 0 | 2 | 6 | 0 | 0 | 0 | 2 | 6 | 0 |
| d′ e′ | 0 | 1 | 2 | 6 | 0 | 0 | 1 | 0 | 8 | 0 | 0 | 0 | 11 | 6 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 8 | 9 | 0 | 0 | 0 | 8 | 9 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 7 | 6 | 0 | 0 | 0 | 7 | 6 | 0 |
| a e′ Total or length. | 10 | 0 | 11 | 0 | 0 | 9 | 5 | 3 | 0 | 0 | 8 | 10 | 3 | 0 | 0 | 8 | 2 | 11 | 6 | 0 | 8 | 7 | 10 | 0 | 0 | 7 | 5 | 10 | 0 | 0 | 7 | 7 | 1 | 0 | 0 | 6 | 9 | 1 | 4 | 0 | 6 | 0 | 1 | 11 | 0 | 5 | 2 | 10 | 0 | 0 |
| Length of the maſſelottes. | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 2 | 6 | 0 | 0 | 0 | 2 | 6 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |

Table of the dimenſions of French iron cannon for the ſea ſervice taken perpendicularly to their axes.

| Dimenſions. | 36 Pounder. | | | | | 24 Pounder. | | | | | 18 Pounder. | | | | | 12 Pounder. | | | | | 8 Pounder long. | | | | | 8 Pounder. ſhort. | | | | | 6 Pounder long. | | | | | 6 Pounder ſhort. | | | | | 4 Pounder long. | | | | | Pounder 4 ſhort. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. |
| aa | 0 | 6 | 10 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 5 | 6 | 0 | 0 | 0 | 4 | 10 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 0 | 3 | 10 | 6 | 0 | 0 | 3 | [illegible] | 6 | 0 | 0 | 3 | 5 | 4 | 0 | 0 | 3 | 5 | 4 | 0 |
| bb | 0 | 5 | 5 | 6 | 0 | 0 | 4 | 9 | 6 | 0 | 0 | 4 | 4 | 6 | 0 | 0 | 3 | 10 | 0 | 0 | 0 | 3 | 5 | 0 | 0 | 0 | 3 | 5 | 0 | 0 | 0 | 3 | 2 | 0 | 0 | 0 | 3 | [illegible] | [illegible] | 0 | 0 | 2 | 10 | 4 | 0 | 0 | 2 | 10 | 4 | 0 |
| cc | 0 | 6 | 10 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 5 | 6 | 0 | 0 | 0 | 4 | 10 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 0 | 3 | 10 | 6 | 0 | 0 | 3 | 10 | 6 | 0 | 0 | 3 | 5 | 4 | 0 | 0 | 3 | 5 | 4 | 0 |
| dd | 1 | 10 | 11 | 0 | 0 | 1 | 8 | 3 | 0 | 0 | 1 | 6 | 10 | 6 | 0 | 1 | 4 | 8 | 0 | 0 | 1 | 2 | 7 | 0 | 0 | 1 | 2 | 7 | 0 | 0 | 1 | 1 | 5 | 0 | 0 | 1 | 1 | 5 | [illegible] | 0 | 0 | 11 | 9 | 5 | 0 | 0 | 11 | 9 | 5 | 0 |
| ee | 1 | 10 | 4 | 6 | 0 | 1 | 7 | 9 | 0 | 0 | 1 | 6 | 6 | 0 | 0 | 1 | 4 | 3 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 1 | 0 | 6 | 0 | 1 | 1 | 0 | [illegible] | 0 | 0 | 11 | 6 | 0 | 0 | 0 | 11 | 6 | 0 | 0 |
| ff | 1 | 9 | 4 | 6 | 0 | 1 | 6 | 8 | 0 | 0 | 1 | 5 | 4 | 0 | 0 | 1 | 3 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 |
| gg | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| hh | 0 | 3 | 2 | 9 | 0 | 0 | 2 | 9 | 9 | 1/3 | 0 | 2 | 6 | 9 | 0 | 0 | 2 | 2 | 10 | 1/3 | 0 | 1 | 11 | 6 | 0 | 0 | 1 | 11 | 6 | 0 | 0 | 1 | 9 | 4 | 0 | 0 | 1 | 9 | 4 | 0 | 0 | 1 | 6 | 8 | 0 | 0 | 1 | 6 | 8 | 0 |
| ii | 0 | 6 | 5 | 6 | 0 | 0 | 5 | 7 | 7 | 0 | 0 | 5 | 1 | 6 | 0 | 0 | 4 | 5 | 9 | 0 | 0 | 3 | 11 | 0 | 0 | 0 | 3 | 11 | 0 | 0 | 0 | 3 | 6 | 8 | 0 | 0 | 3 | 6 | [illegible] | 0 | 0 | 3 | 1 | 4 | 0 | 0 | 3 | 1 | 4 | 0 |
| kl | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 9 | 0 | 0 |
| ll | 1 | 9 | 2 | 0 | 0 | 1 | 6 | 5 | 4 | 0 | 1 | 5 | 0 | 0 | 0 | 1 | 2 | 8 | 6 | 0 | 1 | 1 | 9 | 6 | 0 | 1 | 1 | 8 | 6 | 0 | 0 | 11 | 8 | 6 | 0 | 0 | 11 | 7 | [illegible] | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 10 | 11 | 0 | 0 |
| mm | 1 | 9 | 5 | 0 | 0 | 1 | 6 | 8 | 0 | 0 | 1 | 5 | 2 | 6 | 0 | 1 | 2 | 10 | 0 | 0 | 1 | 1 | 11 | 6 | 0 | 1 | 1 | 10 | 6 | 0 | 0 | 11 | 10 | 6 | 0 | 0 | 11 | 9 | [illegible] | 0 | 0 | 11 | 1 | 6 | 0 | 0 | 11 | 0 | 6 | 0 |
| nn | 1 | 10 | 3 | 0 | 0 | 1 | 7 | 4 | 0 | 0 | 1 | 5 | 10 | 6 | 0 | 1 | 3 | 5 | 10 | 0 | 1 | 2 | 5 | 6 | 0 | 1 | 2 | 4 | 6 | 0 | 1 | 0 | 4 | 6 | 0 | 1 | 0 | [illegible] | 6 | 0 | 0 | 11 | 6 | 0 | 0 | 0 | 11 | [illegible] | 0 | 0 |
| oo | 1 | 9 | 4 | 6 | 0 | 1 | 6 | 7 | 6 | 0 | 1 | 5 | 2 | 1 | 0 | 1 | 2 | 10 | 5 | 0 | 1 | 1 | 11 | 2 | 0 | 1 | 1 | 10 | 2 | 0 | 0 | 11 | 10 | 3 | 0 | 0 | 11 | 9 | [illegible] | 0 | 0 | 11 | 1 | 4 | 0 | 0 | 11 | 0 | 4 | 0 |
| pp | 1 | 9 | 1 | 6 | 0 | 1 | 6 | 4 | 10 | 0 | 1 | 4 | 11 | 5 | 0 | 1 | 2 | 8 | 1 | 0 | 1 | 1 | 9 | 2 | 0 | 1 | 1 | 8 | 2 | 0 | 0 | 11 | 8 | 3 | 0 | 0 | 11 | 7 | [illegible] | 0 | 0 | 10 | 11 | 10 | 0 | 0 | 10 | 10 | 10 | 0 |
| qq | 1 | 8 | 1 | 6 | 0 | 1 | 5 | 3 | 0 | 0 | 1 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 9 | 0 | 0 | 0 | 0 | [illegible] | 0 | [illegible] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| rr | 1 | 8 | 5 | 6 | 0 | 1 | 5 | 7 | 0 | 0 | 1 | 4 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 11 | 0 | 0 | 0 | 0 | [illegible] | [illegible] | [illegible] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ss | 1 | 8 | 5 | 2 | 0 | 1 | 5 | 6 | 8 | 0 | 1 | 4 | 5 | 8 | 1/3 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 10 | 10 | 0 | 0 | 0 | [illegible] | [illegible] | [illegible] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| tt | 1 | 8 | 1 | 2 | 0 | 1 | 5 | 2 | 8 | 0 | 1 | 4 | 1 | 8 | 1/2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 8 | 10 | 0 | 0 | 0 | [illegible] | [illegible] | [illegible] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| uu | 1 | 7 | 0 | 6 | 0 | 1 | 4 | 5 | 0 | 0 | 1 | 3 | 3 | 0 | 0 | 1 | 1 | 3 | 0 | 0 | 1 | 0 | 6 | 0 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 10 | 6 | 6 | 0 | 0 | 10 | 5 | [illegible] | [illegible] | 0 | 10 | 5 | 0 | 0 | 0 | 10 | 4 | 0 | 0 |
| xx | 1 | 7 | 2 | 6 | 0 | 1 | 4 | 7 | 0 | 0 | 1 | 3 | 5 | 0 | 0 | 1 | 1 | 5 | 0 | 0 | 1 | 0 | 8 | 0 | 0 | 1 | 0 | 7 | 0 | 0 | 0 | 10 | 8 | 6 | 0 | 0 | 10 | 7 | [illegible] | [illegible] | 0 | 10 | 7 | 0 | 0 | 0 | 10 | 6 | 0 | 0 |
| yy | 2 | 9 | 1 | 10 | 0 | 2 | 4 | 2 | 2 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 10 | 8 | 6 | 0 | 1 | 8 | 10 | 0 | 0 | 1 | 8 | 7 | 0 | 0 | 1 | 6 | 1 | 10 | 0 | 1 | [illegible] | 0 | 10 | [illegible] | 1 | 5 | 1 | 8 | 0 | 1 | [illegible] | 0 | 8 | 0 |
| zz | 1 | 6 | 4 | 6 | 0 | 1 | 4 | 6 | 0 | 0 | 1 | 2 | 10 | 6 | 0 | 1 | 1 | 0 | 6 | 0 | 0 | 11 | 4 | 0 | 0 | 0 | 11 | 4 | 0 | 0 | 0 | 10 | 4 | 0 | 0 | 0 | 10 | 4 | [illegible] | [illegible] | 0 | 10 | 3 | 6 | 0 | 0 | 10 | 2 | 6 | 0 |
| a′a′ | 1 | 6 | 3 | 6 | 0 | 1 | 3 | 11 | 6 | 0 | 1 | 2 | 9 | 6 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 11 | 3 | 0 | 0 | 0 | 11 | 3 | 0 | 0 | 0 | 10 | 3 | 0 | 0 | 0 | 10 | [illegible] | [illegible] | [illegible] | 0 | 9 | 7 | 8 | 0 | 0 | 9 | [illegible] | 8 | 0 |
| b′b′ | 1 | 5 | 7 | 6 | 0 | 1 | 3 | 3 | 6 | 0 | 1 | 2 | 3 | 6 | 0 | 1 | 0 | 6 | 0 | 0 | 0 | 10 | 11 | 0 | 0 | 0 | 10 | 11 | 0 | 0 | 0 | 9 | 11 | 0 | 0 | 0 | 9 | 11 | [illegible] | [illegible] | 0 | 9 | 4 | 2 | 0 | 0 | 9 | 4 | 2 | 0 |
| c′c′ | 1 | 1 | 3 | 6 | 0 | 0 | 11 | 7 | 6 | 0 | 0 | 10 | 9 | 6 | 0 | 0 | 6 | 6 | 0 | 0 | 0 | 8 | 3 | 0 | 0 | 0 | 8 | 3 | 0 | 0 | 0 | 7 | 7 | 0 | 0 | 0 | 7 | [illegible] | [illegible] | [illegible] | 0 | 7 | 0 | [illegible] | 0 | 0 | 7 | 0 | [illegible] | 0 |
| d′d′ | 1 | 1 | 7 | 6 | 0 | 0 | 11 | 11 | 6 | 0 | 0 | 11 | 1 | 6 | 0 | 0 | 9 | 10 | 0 | 0 | 0 | 8 | 5 | 0 | 0 | 0 | 8 | 5 | 0 | 0 | 0 | 7 | 9 | 0 | 0 | 0 | 7 | [illegible] | [illegible] | [illegible] | 0 | 7 | 2 | [illegible] | 0 | 0 | 7 | [illegible] | [illegible] | 0 |
| e′e′ | 1 | 1 | 3 | 6 | 0 | 0 | 11 | 7 | 6 | 0 | 0 | 10 | 9 | 6 | 0 | 0 | 9 | 6 | 0 | 0 | 0 | 8 | 3 | 0 | 0 | 0 | 8 | 3 | 0 | 0 | 0 | 7 | 7 | 0 | 0 | 0 | 7 | 7 | [illegible] | [illegible] | 0 | 7 | 0 | [illegible] | 0 | 0 | 7 | 0 | [illegible] | 0 |
| f′f′ | 1 | 5 | 3 | 6 | 0 | 1 | 3 | 1 | 6 | 0 | 1 | [illegible] | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 0 | 0 | 10 | 9 | 0 | 0 | 0 | 10 | 9 | 0 | 0 | 0 | 9 | 9 | 0 | 0 | 0 | 9 | [illegible] | [illegible] | [illegible] | 0 | 9 | 1 | 5 | 0 | 0 | 9 | 1 | [illegible] | 0 |
| g′g′ | 1 | 3 | 8 | 6 | 0 | 1 | 1 | 8 | 10 | 0 | 1 | 0 | 8 | 6 | 0 | 0 | 11 | 2 | 2 | 0 | 0 | 9 | 8 | 6 | 0 | 0 | 9 | 8 | 6 | 0 | 0 | 8 | 11 | 0 | 0 | 0 | 8 | 11 | [illegible] | [illegible] | 0 | 8 | 0 | [illegible] | 0 | 0 | 8 | 0 | [illegible] | 0 |
| h′h′ | 1 | 1 | 3 | 6 | 0 | 0 | 11 | 7 | 6 | 0 | 0 | 10 | 9 | 6 | 0 | 0 | 6 | 6 | 0 | 0 | 0 | 8 | 3 | 0 | 0 | 0 | 8 | 3 | 0 | 0 | 0 | 7 | 7 | 0 | 0 | 0 | 7 | [illegible] | [illegible] | [illegible] | 0 | 7 | 0 | 7 | 0 | 0 | 7 | 0 | [illegible] | 0 |
| i′i′ | 0 | 6 | 3 | 0 | 0 | 0 | 5 | 5 | 4 | 0 | 0 | 4 | 11 | 6 | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 3 | 9 | 6 | 0 | 0 | 3 | 9 | 6 | 0 | 0 | 3 | 5 | [illegible] | 0 | 0 | 3 | 5 | [illegible] | [illegible] | 0 | [illegible] | 0 | 0 | 0 | 0 | [illegible] | 0 | 0 | 0 |
| Weight of the cannon. | 7190 lb. | | | | | 5116 lb. | | | | | 4212 lb. | | | | | 2995 lb. | | | | | 2382 lb. | | | | | 2056 lb. | | | | | 1733 lb. | | | | | [illegible] lb. | | | | | | | | | | | | | | |

Table of the dimenſions of the French braſs cannon for land ſervice taken parallel to their axes.

| Dimenſions. | Beſieging or battering cannon. | | | | | | | | | | Garriſon cannon. | | | | | | | | | | Field cannon, 12, 8, and 4 pounders. | | | | | | | | | | | | | | | Cannon for light troops. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 24 Pounder. | | | | | 16 Pounder. | | | | | 12 Pounder. | | | | | 8 Pounder. | | | | | 12 Pounder. | | | | | 8 Pounder. | | | | | 4 Pounder. | | | | | 1 Pounder. | | | | |
| | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. |
| a b | 0 | 8 | 5 | 5 | 0 | 0 | 7 | 4 | 5 | 0 | 0 | 6 | 9 | 0 | 0 | 0 | 5 | 10 | 6 | 0 | 0 | 5 | 3 | 9 | 0 | 0 | 4 | 7 | 7 | 0 | 0 | 3 | 8 | 0 | 0 | 0 | 2 | 10 | 10 | 0 |
| b c | 0 | 0 | 2 | 9 | 0 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 11 | 0 |
| c d | 0 | 2 | 4 | 2 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 1 | 10 | 4 | 0 | 0 | 1 | 7 | 7 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 11 | 6 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 9 | 9 | 0 |
| d e | 0 | 1 | 10 | 6 | 0 | 0 | 1 | 7 | 9 | 0 | 0 | 1 | 5 | 11 | 0 | 0 | 1 | 3 | 8 | 0 | 0 | 1 | 5 | 11 | 0 | 0 | 1 | 3 | 8 | 0 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 7 | 10 | 0 |
| e f | 0 | 0 | 8 | 5 | 0 | 0 | 0 | 7 | 4 | 0 | 0 | 0 | 6 | 8 | 0 | 0 | 0 | 5 | 10 | 0 | 0 | 0 | 6 | 8 | 0 | 0 | 0 | 5 | 10 | 0 | 0 | 0 | 4 | 7 | 0 | 0 | 0 | 2 | 11 | 0 |
| f g | 0 | 0 | 2 | 9 | 0 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 11 | 0 |
| g h | 0 | 0 | 4 | 2 | 0 | 0 | 0 | 3 | 8 | 0 | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 2 | 11 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 1 | 5 | 0 |
| h i | 0 | 0 | 9 | 1 | 0 | 0 | 0 | 6 | 11 | 0 | 0 | 0 | 6 | 2 | 0 | 0 | 0 | 4 | 5 | 0 | 0 | 0 | 10 | 1 | 0 | 0 | 0 | 7 | 8 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 5 | 10 | 0 |
| i k | 0 | 0 | 7 | 6 | 0 | 0 | 0 | 7 | 6 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | | | | | | | | | | | | | | | | | | | | |
| k l | 0 | 0 | 10 | 11 | 0 | 0 | 0 | 9 | 7 | 0 | 0 | 0 | 9 | 6 | 0 | 0 | 0 | 8 | 3 | 0 | 0 | 0 | 9 | 4 | 0 | 0 | 0 | 9 | 2 | 0 | 0 | 0 | 7 | 3 | 0 | 0 | 0 | 3 | 10 | 0 |
| l m | 0 | 1 | 4 | 11 | 0 | 0 | 1 | 2 | 9 | ¾ | 0 | 1 | 1 | 5 | ¾ | 0 | 0 | 11 | 9 | 0 | 0 | 1 | 1 | 5 | ¼ | 0 | 0 | 11 | 9 | 0 | 0 | 0 | 9 | 4 | 0 | 0 | 0 | 5 | 10 | ½ |
| m n | 0 | 1 | 3 | 2 | 0 | 0 | 1 | 6 | 7 | ¾ | 0 | 1 | 2 | 0 | ¾ | 0 | 1 | 4 | 0 | 0 | 1 | 7 | 11 | 0 | ¾ | 1 | 5 | 4 | 4 | 0 | 1 | 1 | 9 | 8 | 0 | 0 | 9 | 7 | 3 | ½ |
| n o | 2 | 0 | 7 | 2 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 11 | 1 | 8 | 0 | 1 | 8 | 9 | 9 | 0 | | | | | | | | | | | | | | | | | | | | |
| o p | 0 | 1 | 4 | 11 | 0 | 0 | 1 | 2 | 9 | 0 | 0 | 1 | 1 | 5 | 0 | 0 | 0 | 11 | 9 | 0 | 0 | 0 | 11 | 2 | 0 | 1 | 0 | 9 | 9 | 0 | 0 | 0 | 7 | 9 | 0 | 0 | 0 | 5 | 10 | 0 |
| p q | 0 | 1 | 2 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 11 | 2 | 0 | 0 | 0 | 9 | 9 | 0 | 0 | 0 | 8 | 11 | 0 | 0 | 0 | 7 | 10 | 0 | 0 | 0 | 6 | 2 | 0 | 0 | 0 | 4 | 10 | 0 |
| q r | 0 | 9 | 0 | 4 | 0 | 0 | 9 | 4 | 6 | 0 | 0 | 9 | 0 | 10 | 0 | 0 | 8 | 3 | 0 | 0 | 0 | 2 | 0 | 4 | 0 | 0 | 1 | 9 | 2 | 0 | 0 | 1 | 7 | 6 | 0 | 0 | 2 | 11 | 9 | 0 |
| r s | 0 | 1 | 5 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 8 | 0 | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 |
| s t | 0 | 5 | 5 | 4 | 0 | 0 | 4 | 9 | 2 | 0 | 0 | 4 | 4 | 9 | 0 | 0 | 3 | 10 | 0 | 0 | 0 | 4 | 4 | 9 | 0 | 0 | 3 | 10 | 0 | 0 | 0 | 3 | 0 | 4 | 0 | 0 | 1 | 10 | 9 | 0 |
| t u | 0 | 1 | 5 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 8 | 0 | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 |
| u v | 0 | 0 | 9 | 6 | 0 | 0 | 0 | 9 | 7 | 0 | 0 | 0 | 10 | 3 | 0 | 0 | 0 | 7 | 10 | 0 | 0 | 2 | 6 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| v x | 0 | 1 | 2 | 1 | 0 | 0 | 1 | 0 | 4 | 0 | 0 | 0 | 11 | 2 | 0 | 0 | 0 | 9 | 9 | 0 | 0 | 0 | 8 | 11 | 0 | 0 | 0 | 7 | 10 | 0 | 0 | 0 | 6 | 2 | 0 | 0 | 0 | 4 | 10 | 0 |
| x y | 0 | 0 | 11 | 3 | 0 | 0 | 0 | 9 | 10 | 0 | 0 | 0 | 8 | 11 | 0 | 0 | 0 | 7 | 10 | 0 | 0 | 0 | 8 | 11 | 0 | 0 | 0 | 7 | 10 | 0 | 0 | 0 | 6 | 2 | 0 | 0 | 0 | 3 | 11 | 0 |
| y z | 4 | 2 | 11 | 10 | ½ | 4 | 2 | 4 | 4 | 0 | 4 | 0 | 0 | 0 | ½ | 3 | 7 | 8 | 0 | 0 | 2 | 4 | 2 | 0 | ½ | 2 | 0 | 6 | 6 | 0 | 1 | 7 | 6 | 5 | 0 | 1 | 6 | 7 | 1 | ½ |
| z a′ | 0 | 0 | 2 | 9 | 0 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 11 | 0 |
| a′ b′ | 0 | 0 | 11 | 3 | 0 | 0 | 0 | 9 | 10 | 0 | 0 | 0 | 8 | 11 | 0 | 0 | 0 | 7 | 10 | 0 | 0 | 0 | 8 | 11 | 0 | 0 | 0 | 7 | 10 | 0 | 0 | 0 | 6 | 2 | 0 | 0 | 0 | 3 | 11 | 0 |
| b′ c′ | 0 | 0 | 2 | 9 | 0 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 11 | 0 |
| c′ d′ | 0 | 10 | 7 | 5 | ½ | 0 | 9 | 3 | 6 | 0 | 0 | 8 | 5 | 4 | ½ | 0 | 7 | 4 | 6 | 0 | 0 | 7 | 6 | 0 | ½ | 0 | 6 | 6 | 5 | 0 | 0 | 5 | 1 | 11 | 0 | 0 | 2 | 9 | 9 | ½ |
| d′ e′ | 0 | 0 | 2 | 9 | 0 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 11 | 0 |
| e′ f′ | 0 | 0 | 8 | 5 | 0 | 0 | 0 | 7 | 4 | 0 | 0 | 0 | 6 | 8 | 0 | 0 | 0 | 5 | 10 | 0 | 0 | 0 | 6 | 8 | 0 | 0 | 0 | 5 | 10 | 0 | 0 | 0 | 4 | 7 | 0 | 0 | 0 | 2 | 11 | 0 |
| a′ f′ the total length | 10 | 10 | 5 | 8 | 0 | 10 | 4 | 4 | 8 | 0 | 9 | 9 | 1 | 5 | 0 | 8 | 9 | 5 | 4 | 0 | 7 | 0 | 7 | 1 | 0 | 6 | 1 | 9 | 0 | 0 | 4 | 10 | 6 | 6 | 0 | 3 | 10 | 0 | 0 | 0 |

A Table of the dimenſions of French braſs cannon for land ſervice, taken perpendicular to their axes.

| Dimenſions. | Beſieging or battering cannon. | | | | | | | | | | Garriſon cannon. | | | | | | | | | | Field cannon, 12, 8, and 4 Pounders. | | | | | | | | | | | | | | | Cannon for light troops. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 24 Pounder. | | | | | 16 Pounder. | | | | | 12 Pounder. | | | | | 8 Pounder. | | | | | 12 Pounder. | | | | | 8 Pounder. | | | | | 4 Pounder. | | | | | 1 Pounder. | | | | |
| | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. | Feet. | Inches. | Lines. | Points. | Fract. |
| a a | 0 | 5 | 6 | 2 | 0 | 0 | 4 | 9 | 9 | 0 | 0 | 4 | 4 | 9 | 0 | 0 | 3 | 10 | 0 | 0 | 0 | 4 | 4 | 9 | 0 | 0 | 3 | 10 | 0 | 0 | 0 | 3 | 0 | 4 | 0 | 0 | 1 | 10 | 9 | 0 |
| b b | 0 | 3 | 6 | 0 | 0 | 0 | 2 | 10 | 6 | 0 | 0 | 2 | 7 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 2 | 11 | 2 | 0 | 0 | 2 | 6 | 8 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 1 | 3 | 2 | 0 |
| c c | 0 | 5 | 6 | 2 | 0 | 0 | 4 | 9 | 9 | 0 | 0 | 4 | 4 | 9 | 0 | 0 | 3 | 10 | 0 | 0 | 0 | 4 | 5 | 9 | 0 | 0 | 3 | 11 | 0 | 0 | 0 | 3 | 1 | 4 | 0 | 0 | 1 | 10 | 9 | 0 |
| d d | 1 | 6 | 0 | 6 | 0 | 1 | 3 | 9 | 7 | 0 | 1 | 2 | 4 | 1 | 0 | 1 | 0 | 6 | 6 | 0 | 1 | 0 | 5 | 6 | 0 | 0 | 10 | 10 | 6 | 0 | 0 | 8 | 7 | 4 | 0 | 0 | 5 | 9 | 0 | 0 |
| e e | 1 | 6 | 0 | 6 | 0 | 1 | 3 | 9 | 7 | 0 | 1 | 2 | 4 | 1 | 0 | 1 | 0 | 6 | 6 | 0 | 1 | 0 | 5 | 6 | 0 | 0 | 10 | 10 | 6 | 0 | 0 | 8 | 7 | 4 | 0 | 0 | 5 | 9 | 0 | 0 |
| f f | 1 | 5 | 4 | 0 | 0 | 1 | 3 | 0 | 5 | 0 | 1 | 1 | 8 | 6 | 0 | 0 | 11 | 11 | 10 | 0 | 0 | 11 | 6 | 10 | 0 | 0 | 10 | 4 | 4 | 0 | 0 | 8 | 0 | 4 | 0 | 0 | 5 | 4 | 4 | 0 |
| g g | 1 | 4 | 8 | 8 | 0 | 1 | 2 | 5 | 0 | 0 | 1 | 1 | 1 | 10 | 0 | 0 | 11 | 6 | 0 | 0 | 0 | 11 | 2 | 6 | 0 | 0 | 10 | 0 | 6 | 0 | 0 | 7 | 9 | 4 | 0 | 0 | 5 | 1 | 6 | 0 |
| h h | 0 | 2 | 8 | 0 | 0 | 0 | 2 | 6 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 1 | 8 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| i i | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| k k | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| l l | 0 | 0 | 6 | 9 | 0 | 0 | 0 | 6 | 9 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| m m | 0 | 2 | 9 | 10 | 0 | 0 | 2 | 5 | 7 | ½ | 0 | 2 | 2 | 10 | ½ | 0 | 1 | 11 | 6 | 0 | 0 | 2 | 2 | 10 | ½ | 0 | 1 | 11 | 6 | 0 | 0 | 1 | 6 | 8 | 0 | 0 | 0 | 11 | 9 | 0 |
| n n | 0 | 5 | 7 | 8 | 0 | 0 | 4 | 11 | 3 | 0 | 0 | 4 | 5 | 9 | 0 | 0 | 3 | 11 | 0 | 0 | 0 | 4 | 5 | 9 | 0 | 0 | 3 | 11 | 0 | 0 | 0 | 3 | 1 | 4 | 0 | 0 | 1 | 11 | 6 | 0 |
| o o | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| p p | 1 | 3 | 7 | 6 | 0 | 1 | 1 | 8 | 1 | 0 | 1 | 0 | 4 | 11 | 0 | 0 | 10 | 10 | 2 | 0 | 0 | 11 | 0 | 4 | 0 | 0 | 9 | 7 | 6 | 0 | 0 | 7 | 7 | 5 | 0 | 0 | 5 | 5 | 2 | 0 |
| q q | 1 | 3 | 10 | 2 | 0 | 1 | 1 | 10 | 5 | 0 | 1 | 0 | 7 | 1 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 11 | 2 | 6 | 0 | 0 | 9 | 9 | 4 | 0 | 0 | 7 | 8 | 11 | 0 | 0 | 5 | 6 | 0 | 0 |
| r r | 1 | 2 | 7 | 6 | 0 | 1 | 1 | 8 | 1 | 0 | 1 | 0 | 4 | 11 | 0 | 0 | 10 | 10 | 2 | 0 | 0 | 11 | 0 | 4 | 0 | 0 | 9 | 7 | 6 | 0 | 0 | 7 | 7 | 5 | 0 | 0 | 5 | 5 | 2 | 0 |
| s s | 1 | 2 | 11 | 2 | 0 | 1 | 1 | 0 | 11 | 0 | 0 | 11 | 10 | 5 | 0 | 0 | 10 | 4 | 6 | 0 | 0 | 10 | 8 | 5 | 0 | 0 | 9 | 4 | 1 | 0 | 0 | 7 | 4 | 9 | 0 | 0 | 5 | 3 | 5 | 0 |
| t t | 1 | 2 | 8 | 6 | 0 | 1 | 0 | 10 | 7 | 0 | 0 | 11 | 8 | 3 | 0 | 0 | 10 | 2 | 8 | 0 | 0 | 10 | 6 | 3 | 0 | 0 | 9 | 2 | 3 | 0 | 0 | 7 | 3 | 3 | 0 | 0 | 5 | 1 | 5 | 0 |
| u u | 1 | 2 | 4 | 8 | 0 | 1 | 0 | 6 | 6 | 0 | 0 | 11 | 5 | 1 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 10 | 1 | 0 | 0 | 0 | 8 | 11 | 6 | 0 | 0 | 7 | 3 | 0 | 0 | 0 | 4 | 4 | 6 | 0 |
| x x | 1 | 2 | 6 | 8 | 0 | 1 | 0 | 8 | 6 | 0 | 0 | 11 | 7 | 1 | 0 | 0 | 10 | 2 | 0 | 0 | 0 | 10 | 9 | 6 | 0 | 0 | 9 | 6 | 6 | 0 | 0 | 7 | 9 | 2 | 0 | 0 | 4 | 6 | 6 | 0 |
| y y | 2 | 1 | 5 | 4 | 0 | 1 | 10 | 2 | 10 | 0 | 1 | 8 | 4 | 7 | 0 | 1 | 5 | 10 | 0 | 0 | 1 | 7 | 7 | 0 | 0 | 1 | 5 | 2 | 6 | 0 | 1 | 1 | 9 | 10 | 0 | 0 | 8 | 4 | 0 | 0 |
| z z | 1 | 2 | 3 | 6 | 0 | 1 | 0 | 6 | 0 | ½ | 0 | 11 | 0 | 11 | 0 | 0 | 9 | 7 | 10 | 0 | 0 | 9 | 8 | 6 | 0 | 0 | 8 | 9 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 4 | 3 | 6 | 0 |
| a′ a′ | 1 | 2 | 3 | 2 | 0 | 1 | 0 | 5 | 9 | 0 | 0 | 11 | 3 | 11 | 0 | 0 | 9 | 10 | 10 | 0 | 0 | 9 | 10 | 3 | 0 | 0 | 8 | 7 | 3 | 0 | 0 | 6 | 9 | 8 | 0 | 0 | 4 | 11 | 6 | 0 |
| b′ b′ | 1 | 2 | 5 | 10 | 0 | 1 | 0 | 8 | 1 | 0 | 0 | 11 | 6 | 1 | 0 | 0 | 10 | 0 | 8 | 0 | 0 | 10 | 0 | 5 | 0 | 0 | 8 | 9 | 1 | 0 | 0 | 6 | 11 | 2 | 0 | 0 | 5 | 0 | 4 | 0 |
| c′ c′ | 1 | 2 | 3 | 4 | 0 | 1 | 0 | 5 | 9 | 0 | 1 | 10 | 3 | 11 | 0 | 0 | 9 | 10 | 10 | 0 | 0 | 9 | 10 | 3 | 0 | 0 | 8 | 7 | 3 | 0 | 0 | 6 | 9 | 8 | 0 | 0 | 4 | 11 | 6 | 0 |
| d′ d′ | 1 | 1 | 6 | 10 | 0 | 0 | 11 | 10 | 7 | 0 | 0 | 10 | 9 | 5 | 0 | 0 | 9 | 5 | 2 | 0 | 0 | 9 | 2 | 4 | 0 | 0 | 8 | 0 | 3 | 0 | 0 | 6 | 4 | 4 | 0 | 0 | 4 | 9 | 8 | 0 |
| e′ e′ | 1 | 1 | 4 | 2 | 0 | 0 | 11 | 8 | 3 | 0 | 0 | 10 | 7 | 3 | 0 | 0 | 9 | 3 | 4 | 0 | 0 | 9 | 0 | 2 | 0 | 0 | 7 | 10 | 5 | 0 | 0 | 6 | 2 | 10 | 0 | 0 | 4 | 7 | 8 | 0 |
| f′ f′ | 0 | 10 | 7 | 6 | 0 | 0 | 9 | 3 | 7 | 0 | 0 | 8 | 5 | 5 | 0 | 0 | 7 | 4 | 8 | 0 | 0 | 7 | 7 | 5 | 0 | 0 | 6 | 7 | 10 | 0 | 0 | 5 | 3 | 2 | 0 | 0 | 3 | 8 | 4 | 0 |
| g′ g′ | 0 | 10 | 10 | 2 | 0 | 0 | 9 | 5 | 11 | 0 | 0 | 8 | 7 | 7 | 0 | 0 | 7 | 6 | 6 | 0 | 0 | 7 | 9 | 7 | 0 | 0 | 6 | 9 | 8 | 0 | 0 | 5 | 4 | 8 | 0 | 0 | 3 | 9 | | 0 |
| h′ h′ | 0 | 11 | 6 | 8 | 0 | 0 | 10 | 6 | 5 | 0 | 0 | 9 | 2 | 3 | 0 | 0 | 8 | 0 | 6 | 0 | 0 | 8 | 4 | 3 | 0 | 0 | 7 | 3 | 8 | 0 | 0 | 5 | 9 | 4 | 0 | 0 | 4 | 0 | 2 | 0 |
| i′ i′ | 0 | 10 | 10 | 2 | 0 | 0 | 9 | 5 | 11 | 0 | 0 | 8 | 7 | 7 | 0 | 0 | 7 | 6 | 6 | 0 | 0 | 7 | 9 | 7 | 0 | 0 | 6 | 9 | 8 | 0 | 0 | 5 | 4 | 8 | 0 | 0 | 3 | 9 | 2 | 0 |
| k′ k′ | 0 | 10 | 7 | 6 | 0 | 0 | 9 | 3 | 7 | 0 | 0 | 8 | 5 | 5 | 0 | 0 | 7 | 4 | 8 | 0 | 0 | 7 | 7 | 5 | 0 | 0 | 6 | 7 | 10 | 0 | 0 | 5 | 3 | 2 | 0 | 0 | 3 | 8 | 4 | 0 |
| l′ l′ | 2 | 0 | 10 | 10 | 0 | 0 | 11 | 3 | 5 | 0 | 0 | 10 | 3 | 1 | 0 | 0 | 8 | 11 | 6 | 0 | 0 | 9 | 11 | 5 | 0 | 0 | 8 | 7 | 10 | 0 | 0 | 6 | 9 | 2 | 0 | 0 | 4 | 5 | 10 | 0 |
| m′ m′ | 1 | 0 | 0 | 4 | 0 | 0 | 10 | 6 | 3 | 0 | 0 | 9 | 6 | 9 | 0 | 0 | 8 | 4 | 4 | 0 | 0 | 8 | 8 | 9 | 0 | 0 | 7 | 7 | 6 | 0 | 0 | 6 | 0 | 4 | 0 | 0 | 5 | 9 | 0 | 0 |
| n′ n′ | 0 | 10 | 7 | 6 | 0 | 0 | 9 | 3 | 7 | 0 | 0 | 8 | 5 | 5 | 0 | 0 | 7 | 4 | 8 | 0 | 0 | 7 | 7 | 5 | 0 | 0 | 6 | 7 | 10 | 0 | 0 | 5 | 3 | - | 0 | 0 | 5 | 3 | 2 | 0 |
| o′ o′ | 0 | 5 | 6 | 2 | 0 | 0 | 4 | 9 | 9 | 0 | 0 | 4 | 4 | 9 | 0 | 0 | 3 | 10 | 0 | 0 | 0 | 4 | 4 | 9 | 0 | 0 | 3 | 10 | 0 | 0 | 0 | 3 | 0 | 4 | 0 | 0 | 1 | 10 | 9 | 0 |
| Weight of Cannon | 5628 lb. | | | | | 4111 lb. | | | | | 3184 lb. | | | | | 2175 lb. | | | | | 1808 lb. | | | | | 1186 lb. | | | | | 590 lb. | | | | | 266 lb. | | | | |
| and Maſſelotte | 3100 lb. | | | | | 2600 lb. | | | | | 1800 lb. | | | | | 1200 lb. | | | | | 1235 lb. | | | | | 950 lb. | | | | | 550 lb. | | | | | 250 lb. | | | | |

*Canon a l'Eſpagnole*, or a Spaniſh cannon, is one, that has a chamber at the bottom of the bore in the form of a ſphere or a little flattened.

*Canon a la Suedoiſe*, or a Swediſh cannon, is a piece, that carries a four pound ball, and weighs about 600 lbs.

*Canon de Campagne ou de bataille*, field or battle-cannon, are pieces that are employed in the field with armies.

The compoſition and proportions of the ingredients made uſe of in caſting braſs cannon, are nearly the ſame in the different nations in Europe. Founders have affected to keep this compoſition a ſecret: it is, however, well known: and if it were not, it would be a ſecret not worth keeping. For none of them have been able to find out a compoſition for ſuch guns, as will enable them to ſtand quick and continued firing, or a hot engagement, without either melting or becoming uſeleſs. They are not ſo well calculated for ſevere and hard ſervices as good iron guns, that are both lighter and more tranſportable.

The common proportion of the copper to the tin in gun-metal, is that of 100 to 12. Some founders put to 240 lbs. of metal fit for caſting 68 lbs. of copper, 52 lbs. of braſs, and 12 lbs. of tin. The Germans put to 4200 lbs. of metal fit for caſting, $3687\frac{33}{41}$ lbs. of copper, $204\frac{13}{41}$ lbs. of braſs, and $307\frac{30}{41}$ lbs. of tin. Some uſe 100 lbs. of copper, 6 lbs. of braſs, and 9 lbs. of tin; and others 100 lbs. of copper, 10 lbs. of braſs, and 15 lbs. of tin. In ſhort, different founders are guided in their proportions of theſe materials, by their own whims and fancies. See Copper.

The French make uſe of mortars, that have their calibers, or the diameters of their bores, each equal to eight inches, three lines of their meaſure. Theſe mortars have cylindric chambers, each of which contains $1\frac{3}{4}$ lbs. of powder. Such a mortar weighs 500 lbs.

They have alſo mortars of twelve inches diameter with cylindric chambers, each of which contains five pounds and a half of powder. Such a mortar weighs 1450 lbs.

They have likewiſe mortars of twelve inches caliber, or diameters with chambers *a poire*, or pear chambers; each of which holds, in like manner, five pounds and a half of powder. Such a mortar weighs 1700 lbs.

They uſe alſo mortars of twelve inches caliber, or diameter with pear chambers, each of which holds twelve pounds of powder. Such a mortar weighs 2300 lbs.

Beſides theſe, they have ſome of ſix inches diameter, and ſome of eighteen inches diameter or caliber.

They likewiſe uſe ſtone mortars, or mortars for throwing ſtones of fifteen inches diameter, with chambers in the form of truncated cones, each of which holds two pounds and a half of powder. Such a mortar weighs 1000 lbs.

Cannon, *ſhip*, are ſtronger in metal than thoſe uſed by land, on account of the neceſſity they are often under of being charged with chain-ſhot. They lie on ſhip-carriages, having four ſmall wheels, without ſpokes, with two ropes to ſtop their running back, and bring them again to their place upon the battery.

Cannon *of courſe*, or *Chace*-Cannon, in a galley, is the largeſt, middlemoſt, and moſt effective of the guns placed in the prow, or chace of the veſſel, and which delivers its ſhot over the very ſtem, generally carrying a ſhot of 33 or 34 pounds weight. It is a long piece, and recoils all along the middle of the galley to the maſt.

Cannon-*mouth of a bit*, in the *Manege*, denotes a round, long piece of iron, ſometimes compoſed of two pieces coupled together and bent in the middle. Cannon-mouths are contrived to keep a horſe in ſubjection, being ſo ordered that they riſe gradually toward the middle and aſcend toward the palate, that the void ſpace left underneath may afford a liberty to the tongue. See Bit.

CANNONADE. To cannonade any object either by ſea or land is to diſcharge or fire cannon at it. A cannonade may take place between fleets, ſhipping, armies, &c. It may be made by ſhips againſt ſhips, towns, works, batteries; or by batteries, works, towns, againſt ſhips, &c. A cannonade may take place between two armies, either occupying field poſitions, or drawn up in order of battle for the purpoſe of engaging. An army ſtanding on the defenſive may keep up a heavy cannonade on the enemy advancing to attack them. The beſiegers may cannonade the works of the beſieged, and the beſieged may cannonade the approaches and batteries thrown up by the beſiegers.

CANNONEER, or Cannonier, a perſon who is employed in the management, or in the working and firing of cannon. It is a term ſometimes made uſe of to denote an artillery-man, a gunner, and ſometimes an artillery officer. Thus, maitre canonier ſignifies an officer of artillery, whoſe duty it is to attend to the pointing, loading, and firing of the cannon in his charge.

CANNULA, in *Surgery*, is a hollow inſtrument, uſually cylindrical, and made of metal; employed for the tranſmiſſion of any fluid out of the body, or for the conveyance of ſome remedial application to an interior organ. For example, the ancients reſorted to ſuch an inſtrument, to defend the adjacent parts, on ſeveral occaſions, when they applied a hot iron ſo as to act as a cautery, (See Cautery); and the moderns employ a cannula to draw off pus or dropſical accumulation from within a large cavity, (ſee Dropsy, and Trocar): but the uſe of a cannula for keeping open deep wounds is very problematical; or rather, it is now generally rejected, as being hurtful in many caſes, and needleſs in all.

Cannula, or Canola, in *Eccleſiaſtical Writers*, was a tube of ſilver, or other metal, wherein were put the relics, which the pope ſent as preſents to princes, &c.

Cannula, or Canola, was alſo a ſort of ſiphon, through which they anciently ſucked the wine in the euchariſt.

CANO, Alonso, in *Biography*, called the Michael Angelo of Spain, from his excelling in the three arts of painting, ſculpture, and architecture, was born in 1600 at the city of Grenada. Having ſtudied the principles of architecture under his father, an eminent architect of his native city, he directed his attention to ſculpture, as a diſciple of Pacheco of Seville, and he afterwards applied himſelf to the art of painting in the academy of Juan del Caſtillo the painter, in the ſame city. Beſides many fine pieces which he executed for the public edifices of Seville, he alſo practiſed ſculpture, and made two coloſſal figures of St. Peter and St. Paul of ſuch peculiar excellence, that the Flemiſh artiſts are ſaid to have viſited Seville in order to have an opportunity of copying them. Claiming noble birth, and poſſeſſing a high ſpirit, his firſt productions were gratuitous. In conſequence of a quarrel with Sebaſtian de Llanos, an eminent painter, which terminated in a duel, he was obliged to quit Seville; and in the ſuite of the count-duke Olivares, as well as under his protection, he went to Madrid, where he was ſoon appointed firſt royal architect, king's painter, and inſtructor to the prince, Don Balthazar Carlos. In this ſituation he acquired diſtinguiſhed reputation as an architect, ſculptor, and painter. His fame, however, excited jealouſy and envy, and he was charged with plagiariſm in the compoſition of his pieces. But another circumſtance occurred, which was much more injurious to his proſperity. Upon his returning home one evening, he found his wife murdered and his houſe pillaged, and an Italian journeyman miſſing. The magiſtrates, diſcovering that Cano had been jealous of this Italian, and that he was attached to another woman, charged him with the murder; and he was reduced to the neceſſity of making a ſpeedy eſcape. He fled for refuge to Valencia, but was ſoon betrayed by the practice of his art; and he then ſought an aſylum in a Carthuſian convent near that city; and being deterred from taking the order by the dread of its auſterities, he returned to Madrid, where he was apprehended and delivered to the torture in order to extort a confeſſion. Having endured the rack without ſelf-crimination, he was again taken into favour by the king; and with a view to his future ſecurity, he obtained the clerical office of reſidentiary of Grenada. In this ſituation he enriched the churches of Grenada and Malaga with many paintings and ſculptures. But having been refuſed the payment of 100 piſtoles by a counſellor of Grenada for an image of St. Anthony of Padua, he daſhed the ſaint in pieces on the floor of his academy. This ſally of paſſion induced the chapter of Grenada to ſuſpend him from his function; but he was reſtored by the king, on the condition of finiſhing a magnificent crucifix, which the king had beſpoken, but which he had long neglected. From this time he led a life of charity and devotion; and when deſtitute of money, he ſupplied the wants of a beggar by ſketching a drawing upon paper, and directing him how to diſpoſe of it. The violence of his temper was ſtill unſubdued; and even in his laſt moments he could not be prevailed upon to make uſe of a crucifix which was preſented to him for adoration, becauſe it was ſuch a wretched piece of work, that he could not bear the ſight of it. Cano died at the age of 76, in the year 1676. Cumberland's Annals of Eminent Painters in Spain. Gen. Biog.

Cano, or Canus, John Sebastian del, a native of Biſcay, who accompanied Magellan in his voyage through the ſtraits, bearing his name, and who, after his death, took the command and proceeded to the iſles of Sunda. Thence doubling the cape of Good Hope, he arrived at Seville in 1522, having performed the voyage round the world in three years and four months. Charles V. gave him for a device a terreſtrial globe, with this legend, "Primus me circumdediſti," i. e. thou firſt haſt ſurrounded me. Moreri. Gen. Biog.

Cano, or Canus, Melchior, a Spaniſh theologian, was a native of Tarançon in the dioceſe of Toledo. Having ſtudied at Salamanca under Francis Victoria, and entered into the order of St. Dominic, he ſucceeded his preceptor in the theological chair in 1546. Between Cano and Bartholomew Caranza, archbiſhop of Toledo, who was alſo at the ſame time profeſſor at Salamanca, there ſubſiſted a jealouſy, which produced two parties in the univerſity. But Cano was ſuperior to his rival in the powers of his genius and the extent of his learning, as well as in the vivacity of his temper and the readineſs of his eloquence. Paul III. deputed him to attend the council of Trent, and in 1552 he was made biſhop of the Canary iſlands. He was diſtinguiſhed, by the favour of king Philip II. and of his unfortunate ſon, Don Carlos, and it is ſaid that he ſacrificed the intereſt of the latter to that of the former. He is alſo charged with having attempted to perſuade the king that he might lawfully make war againſt any ſovereign, in the aſſertion of his own rights; but in advancing this principle, he offended the court of Rome. Such were his ambitious views, that he reſigned his biſhopric in order to be near the court; but he could not long indulge them, as he died at Toledo in 1560, ſoon after he was appointed provincial of Caſtile. His work entitled "Locorum Theologicorum lib. xii." in which he explains the principles or ſources (for that is the ſenſe in which he uſes the term *loci*) whence arguments may be deduced for the confirmation of doctrines and opinions, is highly commended by Du Pin. Whilſt he maintains the authority of the church of Rome, and the infallibility of the pope, he introduces many liberal ſentiments, and it appears that he gave little credit to the legends and forgeries of corrupt ages. We have ſome bold and generous remarks to this purpoſe, cited by Dr. Jortin, in his "Remarks on Eccleſiaſtical Hiſtory," vol. ii. p. 316—319. Cano's Latin ſtyle is good. Beſides the work already mentioned, he alſo wrote "On the Sacraments," and "Six Lectures concerning Penance." Du Pin. Moreri.

Cano, or Ghana, in *Geography*. See Ghana.

Cano, a river of Finland, which paſſes by Biorneborg.

Canoa, a town of Japan, in the province of Iwami.

Canobio, a town of Italy, in the Milaneſe, on the weſt ſide of the lake Maggiore; 13 miles E.S.E. of Domo d'Oſcello. N. Lat. 45° 55'. E. long. 8° 47'

CANOE island, an iſland ſo called by Mr. Mackenzie in his voyage through the N.W. continent of America; ſituate in about N. lat. 53° 31'. W. long. 122° 48'.

Canoe-*ridge*, a rugged mountain of America, about 200 miles W. of Philadelphia, forming the eaſtern boundary of Bald Eagle valley.

Canoe, in *Sea Language*, a ſmall veſſel uſed by various inhabitants of the earth for the purpoſe of fiſhing, of trading, and travelling along rivers, and of war. Canoes are made of different materials, ſuch as the trunk of a tree, the bark of trees, ſkins of animals, &c. Canoes uſed on the American, or other rivers, in conſequence of the curved form of their tranſverſe ſection, carry their lading higher than ſquare-ſectioned boats of ſimilar width; and are therefore capable of conveying large hogſheads of tobacco, or of other articles, with ſafety.

Canoe *of the aborigines of Canada*, is made of the bark of the birch; and ſome are of a ſize ſufficient to contain four or five perſons.

Canoe *of the Eſquimaux*, is made of whalebone, about an inch ſquare; theſe are not ſet like ribs, but are from ſtem to ſtern faſt ſewed to each other with ſtrong ſinews, and covered over with ſeal ſkins. They are from ten to twenty feet long, and about two feet broad; they are formed like a weaver's ſhuttle, ſharp at both ends, ſo that they can be rowed either way. In the middle of the canoe are the ribs, both to keep the ſides aſunder, and to form the hole in the covering wherein the rower ſits. A flat hoop is fitted to this hole, riſing about four inches, to which the ſurrounding ſkin is ſewed. The Indian's ſeal-ſkin jacket, being of a proper length, he can occaſionally bend the ſkirt of it round the outſide of this hoop; by which means, he keeps the canoe free from water, and is enabled to procure his game far from the land, or in ſtormy ſeas. His paddle is from ſix to ten feet long, being light, and flat at each end: this ſerves him to balance and ſteer his canoe, but particularly to row it, which he does with that incredible celerity, that an Engliſh boat with ten oars is not able to keep company with the canoe. The young men in their exerciſe are taught to overſet their canoes, and when the bottom is upward, to recover by the dextrous management of their paddle, their former upright poſition, the men riſing again either on the ſide by which they went down, or on the contrary, as they pleaſe. The conſtruction of this extraordinary little veſſel, ſo admirably well adapted to the purpoſes of its owner, does the greateſt credit to the ingenuity of the conſtructors. There is a canoe of this deſcription in the repoſitory of the Royal Society, and another in the library of the mariſchal college, Aberdeen.

Canoe *of Davis Straights*, is in the form of a barge, ſeven or eight feet long, and two in breadth ; the materials made uſe of are pliant, bent and interlaced like an hurdle, and covered with the ſkins of ſea dogs, or wolves. This light boat carries only one man, who, ſeated in a hole formed in the middle of what, from this circumſtance, appears to be a deck, is enabled to fiſh, or to tranſport himſelf with facility, and without much apparent danger, from one coaſt to another.

Canoe *of the coaſt of Guinea*, is made by hollowing the trunk of a tree ; it is of a long figure, and ſwims with only a ſmall part of its body above the ſurface of the water ; ſo that the perſon who ſits behind, and guides the canoe, is frequently half covered with water. The breadth is no more than ſufficient to contain one man, and the length for ſeven or eight. The men are ſeated on round pieces of wood, and half their bodies are below the gunwale. Each man has an oar of a very hard wood, and all row together, like galley-men, in one concordant motion ; or, if an individual pulls too ſtrongly, putting the canoe out of its line, his miſtake is ſo well counteracted by the man that guides in the ſtern, that the whole ſeems to fly along the ſurface of the water, and cannot be long followed by any European veſſel. When, on the other hand, the ſea is high, they are unable to ſteer, the loftineſs of the waves preventing their anſwering the helm. When the ſurf overſets them, they have the addreſs to turn their canoe in the water, to empty it, and reimbark, without running the ſmalleſt danger, ſwimming all the time like fiſh. Theſe canoes are generally about ſixteen feet long, and one or two broad : there are, however, ſome much larger, meaſuring thirty five feet in length, five in breadth, and three in depth ; they are flat at the ſtern, with a rudder and deck ; the ſails are made of reeds, or of graſs. The canoes are not allowed to remain in the water, but are drawn on ſhore, and placed on four treſſels ; when dry, two men can carry a canoe on their ſhoulders. In ſhaping and hollowing the trunks they have felled, the negroes now make uſe of the hatchets that are ſold to them by the Europeans. They narrow them towards the bottom, and cut each end to a point, giving it a ſmall beak of about a foot long, and of a thickneſs adapted to the hand, for the purpoſe of lifting the canoe.

Canoe *of the Indian* and *Charibbee*, is the ſimple trunk of a tree, hewn on the outſide to the deſired form, and hollowed within by means of fire. Its ſize conſequently depends upon that of the tree of which it is made. It is rowed with paddles and oars, and ſometimes has the aſſiſtance of a little ſail. The lading is placed at the bottom, but as the canoe is not ballaſted, it frequently overſets. The aftermoſt oars ſupply the purpoſe of a rudder.

Canoe *of Nootka Sound.* The large war canoe is generally finiſhed on the ſpot where the tree grows of which it is made, and then dragged to the water-ſide. Some of them have been ſeen which were fifty three feet in length, and eight feet in breadth. The middle part of theſe canoes is the broadeſt, and gradually narrows to a point at each end; but their head or prow is generally much higher than the ſtern. As their bottoms are rounded, and their ſides flam out, they have conſequently ſufficient bearing, and a conſiderable degree of ſtability. They have no ſeats, but ſeveral pieces of wood, about three inches in diameter, are fixed acroſs them to keep their ſides firm, and preſerve them from being warped. The rowers generally ſit on their hams, but ſometimes they make uſe of a kind of ſmall ſtool, which is a great relief to them. In the act of embarking they are extremely cautious, each man regularly taking the ſtation to which he has been accuſtomed. Some of theſe canoes are poliſhed and painted, or curiouſly ſtudded with human teeth, particularly on the ſtern and prow. This is affirmed on the authority of captain Cook, who ſays that the people of the ſea coaſt adorned their canoes with human teeth. But Mr. Mackenzie (Journal of a Voyage through the N.W. Continent of America, p. 335.) informs us, that he was particular in his inquiries, and that he obtained the moſt ſatisfactory proof that captain Cook was miſtaken ; and that his miſtake aroſe from the great reſemblance there is between human teeth and thoſe of the ſea otter, with which the gunwale, fore and aft, of a canoe, which he examined, was inlaid. The ſides were ſometimes adorned with the figure of a dragon with a long tail, of much the ſame form as is ſeen on the porcelain of China, and in the fanciful paintings of other countries.

Canoe *of Ruſſia*, employed on the lake of Wolda, is rounded at both ends ; it is much wider in the middle than at either end, and is worked with a ſingle oar, which is placed at the ſtern : but all the other canoes of that country terminating ſharply both ways, are elevated before as well as behind. They are hardened by means of fire, protected from the weather by paint, and laſhed round for the purpoſe of giving them additional ſtrength.

Canoe *of Terra-del-Fuego* and the *Straights of Magellan*, is of a peculiar conſtruction. The natives take the bark of the largeſt trees, and bend it into a ſhape with ſo much ſkill, that the veſſels have a reſemblance to the gondolas of Venice. For this purpoſe they place it on a ſmall piece of wood, as Europeans place a ſhip on the ſtocks ; and when the bark has taken the gondola form, and the neceſſary bend, they line the bottom and ſides, from one end to the other, with upright pieces of their wood, in the ſame manner as the parts or frames of a ſhip are put together : round the top of the deck another bandage of bark is drawn, in doing which, the utmoſt care is taken to faſten the whole together. Theſe canoes are from ten to ſixteen feet in length, and two in breadth ; holding with ſufficient convenience, ſeven or eight men, who row ſtanding, and with extreme celerity. See alſo the articles boat, proa, &c.

CANOGE, or Canouge, in *Geography*, a town of Hindooſtan, ſeated on the right bank of the Ganges, near the place where the Calini or Callynuddi river joins it. Its ruins are even now of great extent, and in an early part of the Chriſtian æra, it was the capital of Hindooſtan, or rather of the principal kingdom along the Ganges, and is poſſibly the place meant by Pliny for Calinipaxa. It is at preſent reduced to the ſize of a middling town. It is ſaid to have been built more than 1000 years before our æra ; and is mentioned in Feriſhta (326 years B. C.) as the capital of all Hindooſtan, under the predeceſſor of Phoos, or Porus, who fought againſt Alexander. Canoge correſponds, with regard to extent and magnificence, to the deſcription given of Palibothra, and in ſome reſpects, to the local poſition aſſigned to it by Ptolemy and Eratoſthenes ; but other authorities aſſign this place to Patna. The Indian hiſtories abound with the accounts of its grandeur, and populouſneſs. Its walls are ſaid to have been 100 miles in circumference, and its third emperor, Sinkal, could bring into the field 400 elephants, 100,000 horſe, and 400,000 foot. In the ſixth century it was found to contain 30,000 ſhops, in which betel nut was ſold, 3000 jewellers, and 60,000 bands of muſicians, who paid a tax to government. In the year 1018 it was ſeized by the Gaznian emperors, at which time it gave its name to the kingdom, of which it was the capital. It is diſtant from Agra 127 miles; from Benares 259 ; from Bombay 889 ; from Calcutta by Moorſhedabad 824, by Birboom 719 ; from Delhi 214; from Lucknow 75 ; from Madras 1141 ; from Nagpour 486 ; from Ougein 464; and from Poonah 842. N. lat. 27° 3′. E. long. 80° 13′.

CANON, in *Eccleſiaſtical Hiſtory*, a perſon who poſſeſſes a prebend or revenue allotted for the performance of divine ſervice, in a cathedral, or collegiate church.

Canons are of no great antiquity: Paſchier obſerves, that the name canon was not known before Charlemagne; at leaſt the firſt we hear of are in Gregory de Tours, who mentions a college of canons, inſtituted by Baldwin XVI. archbiſhop of that city, in the time of Clotharius I. The common opinion attributes the inſtitution of this order to Chrodegangus, biſhop of Metz, about the middle of the eighth century.

Originally canons were only prieſts, or inferior eccleſiaſtics, who lived in community; reſiding by the cathedral church to aſſiſt the biſhop; depending entirely on his will; ſupported by the revenues of the biſhopric; and living in the ſame houſe, as his domeſtics or counſellors, &c. They even inherited his moveables till the year 817, when this was prohibited by the council of Aix-la-Chapelle, and a new rule ſubſtituted in the place of that which had been appointed by Chrodegangus, and which was obſerved for the moſt part in the weſt till the twelfth century. By degrees theſe communities of prieſts, ſhaking off their dependence, formed ſeparate bodies; whereof the biſhops, however, were ſtill heads. In the tenth century there were communities, or congregations of the ſame kind, eſtabliſhed even in cities where there were no biſhops: theſe were called collegiates, and as they uſed the terms congregation and college indifferently: the name chapter, now given to theſe bodies, being much more modern. Under the ſecond race of the French kings, the canonical, or collegiate life, had ſpread itſelf all over the country; and each cathedral had its chapter, diſtinct from the reſt of the clergy.

They had the name canon from the Greek κανων, which ſignifies three different things; a rule, a penſion, or fixed revenue to live on, and a catalogue or matricula; all which are applicable to them.

In time, the canons freed themſelves from their rules, the obſervance relaxed, and at length they ceaſed to live in community; yet they ſtill formed bodies; pretending no other functions beſides the celebration of the common office in the church; yet aſſuming the rights of the reſt of the clergy; making themſelves as a neceſſary council of the biſhop; taking upon them the adminiſtration of a ſee during a vacancy, and the election of a biſhop to ſupply it. There are even ſome chapters exempt from the juriſdiction of the biſhop, and owning no head but their dean. After the example of cathedral chapters, collegiate ones alſo continued to form bodies, after they had abandoned living in community.

Canons are of various kinds; as,

CANONS, *cardinal*, or thoſe attached, and as the Latins call it, *incardanati* to a church, as a prieſt is to a pariſh.

CANONS, *domicellary*, were young canons, who not being in orders, had no right in any particular chapters.

CANONS, *expectative*, were ſuch as, without having any revenue or prebend, had the title and dignities of canons, a voice in the chapter, and a place in the choir, till ſuch time as a prebend ſhould fall.

CANONS, *foreign*, were ſuch as did not officiate in the canonries to which they belonged.—To theſe were oppoſed *manſionary canons*, or *canons reſidentiary*.

CANONS, *lay* or *honorary*, are ſuch among the laity, as have been admitted, out of honour and reſpect, into ſome chapter of *canons*.

CANONS *regular*, are *canons* that ſtill live in community; and who, like religious, have, in proceſs of time, to the practice of their rules, added the ſolemn profeſſion of vows.

They are called *regulars*, to diſtinguiſh them from thoſe *ſecular* canons who abandoned living in community, and at the ſame time, the obſervance of the canons made as the rule of the clergy, for the mainterance of the ancient diſcipline.

The canons ſubſiſted in their ſimplicity till the eleventh, ſome ſay the twelfth century, when ſome of them, ſeparating from the community, took with them the name of canons, or acephalous prieſts, becauſe they declined to live in community with the biſhop; and thoſe who were left, thenceforth acquired the denomination of canons regular, and adopted moſt of the profeſſions of the rule of St. Auguſtine. This order of regular canons of St. Auguſtine was brought into England by Adelwald, confeſſor to Henry I. who erected a priory at Noſtel in Yorkſhire, and obtained for them the church of Carliſle as an epiſcopal ſee, with the privilege of chuſing their own biſhop. They were ſingularly protected and encouraged by Henry I. who gave them the priory of Dunſtable in 1107, and by queen Maud, who in the following year, gave them the priory of the Holy Trinity in London. It appears, that under the reign of Edward I. they had fifty-three priories.

CANONS, *tertiary*, thoſe who had only the third part of the revenues of the canonicate.

CANON, in an *Eccleſiaſtical Senſe*, is a law or rule, either of doctrine or diſcipline, enacted eſpecially by a council, and confirmed by the authority of the ſovereign.

Canons are properly deciſions of matters of religion; or regulations of the polity and diſcipline of a church, made by councils either general, national, or provincial. See COUNCIL.

Such are the canons of the council of Nice, or Trent, &c. See CONSTITUTIONS.

There have been various collections of the canons of the Eaſtern councils; but four principal ones, each ampler than the preceding. The firſt, according to Uſher, A. D. 380, containing only thoſe of the firſt œcumenical council, and the firſt provincial ones: they were but 164 in number. To theſe, Dionyſius Exiguus, in the year 520, added the fifty canons of the apoſtles, and thoſe of the other general councils. The Greek canons in this ſecond collection, end with thoſe of the council of Chalcedon; to which are ſubjoined thoſe of the council of Sardica, and the African councils. The fourth and laſt collection comes down as low as the ſecond council of Nice; and it is on this that Balſamon and Zonaras have commented. See Hardouin's Acta Conſiliornm et Epiſtolæ decretales ac Conſtitutiones Summorum Pontificum, in 11 tomes; commencing with the year 34, and terminating in 1714. Prol. Paris, 1715.

CANONS, *Apoſtolical*, are thoſe which have been uſually aſcribed to St. Clement, in order to procure for them a high degree of authority. They contain a view of the church government and diſcipline received among the Greek and oriental Chriſtians in the ſecond and third centuries. Bellarmin, Baronius, &c. will have them to be genuine canons of the apoſtles. Cotelerius obſerves, (Jud. de. Canon. Ap. ap. Patr. Ap. t. 1.) that they cannot be aſcribed to the apoſtles or Clement, becauſe they are not received with other books of Scripture, are not quoted by the writers of the firſt ages, and contain many things not agreeable to the apoſtolical times. Hincmar, De Marca, Beveridge, &c. take them to be framed by the biſhops who were the diſciples of the apoſtles in the end of the ſecond and beginning of the third centuries. Beveridge (Cod. Can. Vindicat. l. i. c. x. 4.) acknowledges that they are interpolated in ſeveral places, though he profeſſes a great veneration for them, and has undertaken to defend them. The biſhop aſcribes a kind of apoſtolical authority to the 50th canon, which requires of the biſhops and preſbyters that they ſhould make uſe of a three-fold immerſion in baptiſm, under pain of being depoſed. The 69th canon ſtrictly

It requires the obſervation of the quadrageſimal faſt, under ſpiritual pains and penalties; and this, together with other ſtated faſts, Beveridge ſuppoſes to have been of apoſtolical inſtitution. S. Baſnage is of opinion, that they were collected by an anonymous writer in the fifth century; but Daille, &c. maintain them to have been forged by ſome heretic in the ſixth century; and S. Baſnage conjectures, that ſome of them are ancient, and others not older than the ſeventh century. The 85th canon contains a catalogue of the books of the Old and New Teſtament; which, from the books of the New Teſtament, that are enumerated in it, could not have been drawn up till after the third century. The epiſtle to the Hebrews was rejected, or doubted of by many in the firſt three centuries, and alſo in the fourth century; but if this canon had been then in being, and acknowledged as apoſtolical, that epiſtle would have been received by all. Several of the catholic epiſtles, that of James, the ſecond of Peter, the ſecond and third of John, and that of Jude, were rejected, or doubted of by many in the early times of Chriſtianity; whereas they would have been received by all, if this canon had been in being, or had been acknowledged to be apoſtolical. This argument is urged by Mill, in his "Prolegomena," p. 201. Moreover, the Revelation was received by many in the ſecond, and third, and following centuries, which would not have been the caſe, if there had been a canon compoſed by the apoſtles, or Clement their companion, in which all other books of Scripture were diſtinctly enumerated, and that omitted. How, ſays Baronius to this purpoſe, could ſo many of the Latin and Greek writers receive the Revelation, which was wanting in an apoſtolical canon? And how could there have been ſuch different opinions about the epiſtle to the Hebrews, and ſeveral of the catholic epiſtles, if they had been made canonical by an apoſtolical decree? Beſides, the firſt epiſtle of Clement was reckoned canonical by very few, if any of the writers of the firſt three centuries; therefore this pretended apoſtolical canon, which gives it a place among books of ſacred Scripture, was not in being; and the ſecond epiſtle of Clement was not eſteemed his in the third century, though the catalogue of this canon includes it. The Greek church allows only 85 of theſe canons, and the Latins only 50; though there are 84 in the edition given of them in the "Corpus Juris canonici." See Lardner's works, vol. iv. p. 354., and Jortin's Rem. on Eccles. Hiſt. vol. i. p. 278. &c. Cave, Hiſt. Lit. vol. i. p. 29. Jones's New and Full Method of ſettling the Canonical Authority of the New Teſtament, vol. i. p. 25.

Canon, is alſo uſed for the authorized catalogue of the ſacred writings. The word is originally Greek, Κανων, and ſignifies a rule or ſtandard, by which other things are to be examined and judged. Accordingly the ſame word has been applied to the "tongue of a balance," or that ſmall part, which, by its perpendicular poſition, determines the even poize or weight, or, by its inclination either way, the uneven poize of the things which are weighed. To this purpoſe is the obſervation of the ancient ſcholiaſt of Ariſtophanes in Ran. v. 809. Hence it appears, that as the writings of the prophets, apoſtles, and evangeliſts contain an authentic account of the revealed will of God, they are the rule of the belief, and practice of thoſe who receive them.

Canon ſeems alſo ſometimes to be equivalent to a liſt or catalogue, in which are inſerted thoſe books, that contain the rule of faith. Hence Du Pin, and others, have ſuppoſed, that theſe books are called canonical, becauſe they are placed in the catalogue of ſacred books. It has been ſaid, however, that the Greek word is never uſed in this ſenſe, by any prophane writers, nor even among the Chriſtians, till the fourth century; before which time the word was certainly applied to the ſacred volume. Mr. Whiſton (Eſſay on the Apoſtolical Conſtit. chap. i. §. 6.) imagines the canon of Scripture, or the canonical books of the Old and New Teſtament, to be thoſe, and only thoſe, which are inſerted in the laſt apoſtolical canon, and that they were ſo ſtiled by the ancients only on that account. But as the ſpuriouſneſs of theſe pretended apoſtolical canons is very generally allowed, it is needleſs to refute this opinion. See *Apoſtolical* Canons.

The uſe of this appellation, as applicable to the books of Scripture, is undoubtedly very ancient. St. Paul has twice uſed the word canon, or rule. Gal. vi. 16. Philip, iii. 16. And though in theſe paſſages he may refer to the doctrine of the goſpel in general, or to ſome particular maxim of it, and not to any books containing the rule of faith, yet his uſe of the word may have given occaſion for fixing that denomination to the books of Scripture. Irenæus, ſpeaking of the Scriptures, (Adv. Hæres. l. iv. c. 69.) ſtiles them τον κανονα της αληθειας, i. e. the canon of truth; and here canon is not a catalogue, but the books, or the doctrine contained in the books of Scripture. Clement of Alexandria, (Strom. l. 4. p. 453.) diſputing with ſome heretics of his time, blames them for making uſe of apocryphal Scriptures, "chuſing to follow any thing, rather than the true evangelical canon (or the canon of the goſpel)." In another place (Strom. l. vi. p. 676.) he ſays, "the eccleſiaſtical canon is the conſent and agreement of the law and the prophets with the Teſtament delivered by the Lord." Euſebius (Hiſt. Eccleſ. l. vi. c. 25.) tells us, that Origen, in his expoſition on Matthew, enumerates the books of Scripture according to the canon of the church; i. e. the canon received and eſtabliſhed in the church. Athanaſius, in his Feſtal epiſtle, mentions three ſorts of books, the canonical, which are thoſe now received by us, ſuch as were allowed to be read, and ſuch as are apocryphal, by which he means books forged by heretics. In the Synopſis of Scripture, which ſome have aſcribed to him, but probably not written till 100 years after his time, near the end of the fifth century, there occurs frequent mention of canonical and uncanonical books. The council of Laodicea, about 363, ordains, that "no books, not canonical, ſhould be read in the church, but only the canonical books of the Old and New Teſtament." The third council of Carthage, about 397, ordains, "that nothing beſide the canonical Scriptures be read in the church under the name of Divine Scriptures." Epiphanius, Philaſtrius, Rufinus, Jerome, Auguſtine, Chryſoſtom, Iſidore of Peluſium, and Leontius of Conſtantinople, uſe the words canon and canonical in the ſame ſenſe. Hence we may infer, how much the uſe of theſe words, canon and canonical, has obtained among Chriſtians, to denote thoſe books, which are of the higheſt authority, and the rule of faith; as oppoſed to all others whatever, particularly to eccleſiaſtical, or the writings of orthodox and learned catholics, and to apocryphal, the productions, chiefly of heretics, which by a ſpecious name and title made a pretenſion to be accounted among ſacred books. The moſt common and general diviſion of the canonical books is that of ancient and new, or the Old and New Teſtament.

The canon of the Old Teſtament is much more eaſily ſettled than that of the New; becauſe whatever almoſt may be objected againſt the authority of the preſent canon of the former, either in behalf of any books which are not in it, or againſt any that are, may be anſwered by this ſingle conſideration, viz. that we receive the ſame and no other books than ſuch as were received by the Jewiſh church in the time of our Saviour, as is evident from the copies of them procured by the Chriſtians, and the catalogues they made of them ſoon after the deſtruction of Jeruſalem. Some difference,

ence, however, has occurred in the mode of their arrangement. Hody ſays (de Bib. Text. Orig. l. ii. c. 9. p. 190.) that the diviſion of the ſacred books into the Law, the Prophets, and Chetubhim, or Hagiographa, is of the higheſt antiquity. The Jews are ſaid by ſome, but as others think, without ſufficient evidence, to have aſcribed it to the prophet Ezra. Although the Jewiſh people have been very uniform in the number of ſacred books received by them, they have varied, and have been ſomewhat arbitrary, in the general denominations and diviſions of them. Iſaac Voſſius ſuſpects that the above mentioned diviſion, was an invention of Aquila, who, in the ſecond century, made a new verſion of the Jewiſh ſcriptures into Greek; whereas, the old partition was that of the Law, the Prophecies, and Pſalms. Dr. Lardner obſerves, that no traces of it appear in the Scriptures of the Old or New Teſtament, nor in Joſephus, nor in Philo, nor in any Chriſtian writers before Epiphanius and Jerom, near the end of the fourth century. Some, indeed, have ſuppoſed that this tripartite diviſion is referred to in Luke, xxiv. 44; but other learned and judicious perſons, as Leuſden and Wolfius, are of opinion that by the "Pſalms" in this place we are not to underſtand the metrical books, or any other general diviſion of the ſcriptures of the Old Teſtament, but the book of Pſalms. J. Fr. Buddeus, (Hiſt. Eccleſ. Vet. Teſt. tom. poſterior, p. 828, 4to. Halæ Magdeb. 1719.) cited by Lardner, ſays it is uncertain when and by whom this partition was firſt uſed; and he alſo ſhews the impropriety and inconvenience of it, as generally uſed by the Jews. It does not appear that any notice is taken of it, or regard had to it in Melito, Origen, Cyril, or Athanaſius. Among thoſe who have uſed this partition, there ſeems to have been a great variety of opinions concerning the books that ſhould be called "Hagiographa." The term has nothing in it appropriating and diſtinctive, and this may have been the ground of that difference of opinion among thoſe who have uſed it, concerning the books that ſhould be placed in this claſs. Every other partition of the ſacred books of the Old Teſtament, with which we are acquainted, ſeems, in the judgment of Dr. Lardner, to be preferable to this of the Law, Prophets, and Hagiographa. Thoſe denominations, which we ſometimes meet with in the New Teſtament, the "Law," or "the Prophets," denoting in general the ancient ſacred writings, are very juſt. The dichotomy, "the Law and the Prophets," ſo common in the New Teſtament, is very proper. The tripartite diviſion in Luke, xxiv. and Joſephus, "the Law, the Prophets, and Pſalms or Hymns," is alſo very proper. Another partition is that uſed by Cyril of Jeruſalem, viz. legal, hiſtorical, metrical, and prophetical, which ſeems to have been regarded by Athanaſius, Origen, and Melito, in their catalogues, appears to Lardner and others the moſt proper and commodious.

Some have placed the books of the Old Teſtament from the firſt to the laſt, in chronological order. This, however, is a matter of no importance, and might be found inconvenient. But if they are divided into claſſes, the order of time may be uſeful. Accordingly, in the firſt claſs, muſt be the five books of Moſes; then the hiſtorical books, Joſhua, Judges with Ruth, Samuel, the Kings, the Chronicles, Ezra, Nehemiah, Eſther; next the metrical books, Job, the Pſalms, the Proverbs, Eccleſiaſtes, the Canticles; laſtly, the prophetical books, the twelve prophets in one book, each of which might be placed, according to the order of time, Iſaiah, Jeremiah with the Lamentations, Ezekiel, Daniel; or, firſt of all, the four larger prophets, and then the book of the twelve leſſer prophets, as they are called: by which we perceive, that the preſent order of books in our Bibles is, in the main, ſuch as we have reaſon to be well ſatisfied with.

The firſt catalogue of the books of the Old Teſtament recorded by any Chriſtian writer is that of Melito, biſhop of Sardis, in Lydia, who is placed by Cave at the year 170. He travelled into Paleſtine on purpoſe to learn the number of theſe books. Euſebius has preſerved his catalogue, and he ſays, that it is a catalogue of the ſcriptures of the Old Teſtament univerſally acknowledged. It contains the books received by the Jews into their canon; but he does not mention the book of Eſther. The order in which he enumerates them is as follows, viz. five books of Moſes, Joſhua, Judges, Ruth, four books of the Kings, two books of Chronicles, the Pſalms of David, the Proverbs of Solomon, the Eccleſiaſtes, the Canticles, Job, the books of the Prophets Iſaiah, Jeremiah, the 12 Prophets in one book, Daniel, Ezekiel, Ezra. Origen, about 230, has a catalogue, in which the books occur in the following order, viz. five books of Moſes, Joſhua, Judges with Ruth, one book; the firſt and ſecond book of the Kings, called by them Samuel, and reckoned one book; the third and fourth of the Kings, alſo one book; the firſt and ſecond of the Remains, in one book; Eſdras, firſt and ſecond, in one book, called by them Ezra; the book of the Pſalms; Solomon's Proverbs, Eccleſiaſtes, Canticles, Iſaiah, Jeremiah, Daniel, Ezekiel, Job, Eſther. The book of the Twelve Prophets is wanting in our copies. Athanaſius, in his Feſtal Epiſtle, and alſo in the Synopſis Scripturæ, aſcribed to him, enumerates the books in this order, viz. firſt, the five books of Moſes; then the hiſtorical books, from Joſhua to Ezra; then, the books in verſe, the Pſalms, Proverbs, Eccleſiaſtes, Canticles, Job; laſtly, the Prophets, which are the Twelve Prophets in one book, Iſaiah, Jeremiah, Ezekiel, and Daniel. Cyril of Jeruſalem, about 348, has a catalogue, in which he uſes diviſions. The firſt are the five books of Moſes; then the hiſtorical books; after them, five books in verſe, Job, the Pſalms, the Proverbs, Eccleſiaſtes, the Canticles; and, laſt of all, five prophetical books, which are the Twelve Prophets, in one book, Iſaiah, Jeremiah, Ezekiel, Daniel. Epiphanius, about 368, has three catalogues; in two of which all the books of the Old Teſtament are enumerated from Geneſis to Ezra or Eſther, without any partitions. But in the other he divides them, obſerving, that the books of ſcripture are compriſed in four Pentateuchs, and two over and above the firſt Pentateuch, or that which is moſt properly ſo, containing the five books of the Law: the next contains the five books in verſe, the book of Job, the Pſalter, the Proverbs of Solomon, the Eccleſiaſtes, the Canticles: the third Pentateuch contains thoſe called Graphica, by others Hagiographa, which are the book of Joſhua, the book of Judges with Ruth, the firſt and ſecond of the Remains, the firſt and ſecond of the Kingdoms, and the third and fourth of the Kingdoms: the fourth Pentateuch conſiſts of the Twelve Prophets, in one book, Iſaiah, Jeremiah, Ezekiel, Daniel; the two others, over and above theſe, are the two books of Ezra, reckoned one book, and Eſther. This catalogue is followed by John Damaſcenus, about the year 830. Jerom, A. D. 392, enumerates 22 books of the old law, according to the number of the Hebrew letters; viz. five books of Moſes, viz. Geneſis, Exodus, Leviticus, Numbers, and Deuteronomy; eight of the prophets, viz. Joſhua, Judges with Ruth, Samuel, Kings, Iſaiah, Jeremiah, Ezekiel, and the Twelve Prophets; and nine of the Hagiographa, viz. Job, David or the Pſalms, Solomon comprehending three books, i. e. Proverbs, Eccleſiaſtes, and the Song of Songs; Daniel, Chronicles, Ezra, and Eſther. Hence we ſee, that St.

Jerom's canon of the Old Teſtament was that of the Jews. All other books not received by them, he calls Apocryphal. See APOCRYPHAL.

In the catalogue of Rufinus, about the year 397, the books of the Old Teſtament are enumerated in the following order; viz. in the firſt place, are the five books of Moſes, Geneſis, Exodus, Leviticus, Numbers, Deuteronomy. After theſe are Joſhua and Judges, together with Ruth. Next the four books of the Kingdoms, which the Hebrews reckon two; the book of the Remains, which is called the Chronicles, and two books of Ezra, which by them are reckoned one, and Eſther. The prophets are Iſaiah, Jeremiah, Ezekiel, and Daniel; and beſides, one book of the Twelve Prophets: Job alſo, and the Pſalms of David. Solomon has left three books to the churches, the Proverbs, Eccleſiaſtes, and the Song of Songs. In the third, otherwiſe called the ſixth, council of Carthage, aſſembled in 397, it was ordained, that nothing beſide the canonical ſcriptures ſhould be read in the church under the name of Divine Scriptures; and that the canonical ſcriptures are theſe, Geneſis, Exodus, Leviticus, Numbers, Deuteronomy, Joſhua, Judges, Ruth, four books of the Kingdoms, two books of the Remains, Job, David's Pſalter, five books of Solomon, the books of the twelve prophets, Iſaiah, Jeremiah, Ezekiel, Daniel, Tobit, Judith, Eſther, two books of Ezra, and two books of the Maccabees. Upon this canon it has been remarked, that this council was not general, but provincial, or national; that the biſhops aſſembled do not ſhew much learning or judgment, when they reckon five books of Solomon; that the decree of this council, by placing among canonical ſcriptures Tobit, Judith, and the two books of the Maccabees, contradicts antiquity, or ought to be explained with a diſtinction; the word canonical being uſed laxly, ſo as to comprehend not only thoſe books which are admitted as the rule of faith, but thoſe alſo which are eſteemed uſeful, and may be publicly read for the edification of the people: and that this council mentions only two books of Ezra, meaning, probably, the book of Ezra properly ſo called, and the book of Nehemiah; but nothing is ſaid of the other two, ſometimes called the third and fourth books of Ezra. According to Auguſtine, (De Doctrin. Chriſt. l. ii. c. 8. tom. iii. p. i. Bened.) about 397, the entire canon of ſcripture is the following books, which he thus enumerates. There are five of Moſes, that is, Geneſis, Exodus, Leviticus, Numbers, Deuteronomy; one book of Joſhua; one of the Judges; one ſmall book called Ruth, which ſeems rather to belong to the beginning of the Kingdoms; then the four books of the Kingdoms, and two of the Remains, not following one another, but proceeding, as it were, parallel on the ſide of each other. Theſe are hiſtorical books, which contain a ſucceſſion of times in the order of events. There are others which do not obſerve the order of time, and are unconnected together: as Job, Tobit, Eſther and Judith, and the two books of the Maccabees, and the two books of Eſdras; which laſt do more obſerve the order of a regular ſucceſſion of things, after that contained in the Kingdoms and Remains. Next are the Prophets; among which is one book of the Pſalms of David, and three of Solomon, the Proverbs, the Song of Songs, and Eccleſiaſtes. For thoſe two books, Wiſdom and Eccleſiaſticus, are called Solomon's for no other reaſon but becauſe they have a reſemblance with his writings; for it is a very general opinion, that they were written by Jeſus, the ſon of Sirach: which books, however, ſince they are admitted into authority, are to be reckoned among prophetical books. The reſt are the books of thoſe who are properly called prophets: as the ſeveral books of the twelve prophets, which, being joined together and never ſeparated, are reckoned one book. The names of which prophets are theſe; Hoſea, Joel, Amos, Obadiah, Jonah, Micah, Nahum, Habbakkuk, Zephaniah, Haggai, Zechariah, Malachi. After them are the four prophets of larger volumes; Iſaiah, Jeremiah, Daniel, Ezekiel. In theſe 44 books is compriſed all the authority of the Old Teſtament.

From this extract it appears, that there was not then any canon of ſcripture ſettled by any authority, that was univerſally acknowledged by chriſtians. Though there might be decrees of councils relating to this matter, they were not eſteemed deciſive and of authority, every where, and by all. But ſtill private and inquiſitive chriſtians had a right to uſe their own judgment concerning this point. Although Auguſtine ſays, that Wiſdom and Eccleſiaſticus ought to be reckoned among prophetical books, &c.; yet Rufinus and Jerom, who were a little older, muſt be allowed to bear a right teſtimony, and to declare truly what was the ſentiment of moſt chriſtian churches, when they ſay, that "the Wiſdom of Solomon, Eccleſiaſticus, Tobit, Judith, and the Maccabees, were indeed allowed to be publicly read: but that nevertheleſs they were not canonical, and that no doctrine of religion may be proved by their authority." From other paſſages in the works of Auguſtine it appears, that he acknowledged only 3 books of Solomon to be his; the Proverbs, Eccleſiaſtes, and Canticles; and that the Jews have no more of his writings in their canon. With regard to the books of Wiſdom and Eccleſiaſticus, he obſerves, that though they were eſteemed by ſome, on account of ſome reſemblance of ſtyle and deſign, to be Solomon's, the learned are ſatisfied they are not his; and that they were chiefly reſpected by the Weſtern chriſtians. He particularly owns that the book of Judith was not in the Jewiſh canon. Auguſtine, indeed, often quotes thoſe books of the Old Teſtament which we now generally call apocryphal, as Wiſdom, Tobit, Eccleſiaſticus, and the Maccabees; but he frequently uſes expreſſions which ſhew they were not eſteemed the books of the prophets, or of equal authority with the books of the Jewiſh canon. In his "Retractations" (l. i. c. 20,) he owns his miſtake in quoting the book of Eccleſiaſticus as prophetical; when it was not certain that it was written by a prophet. He alſo ſays in another place, (l. ii. c. 20) that he had not any proof of ſome propoſitions which he had advanced, but from the book of Wiſdom, which the Jews did not receive as of canonical authority. In another work written about the year 420, he ſays, "The Jews do not receive the ſcripture of the Maccabees as they do the Law, and the Prophets, and the Pſalms, to which our Lord bears teſtimony, Luke xxiv. ſo that upon the whole, Auguſtine ſeems not to differ from Jerom and Rufinus. For the teſtimonies of other ancient writers, Chryſoſtom, Theodoret, Coſmas of Alexandria, Gregory biſhop of Rome, Leontius, &c. to the Jewiſh canon, we muſt refer to Lardner, *ubi infra.* In the Stichometry of Nicephorus, patriarch of Conſtantinople, who flouriſhed in the beginning of the ninth century, we have a catalogue of the books both of the Old and New Teſtament. The divine ſcriptures mentioned in this work as received by the church and reckoned canonical, are; Geneſis, Exodus, Leviticus, Numbers, Deuteronomy, Joſhua, Judges, and Ruth, the firſt and ſecond books of the Kingdoms, the third and fourth of the Kingdoms, the firſt and ſecond of the Remains, Ezra, firſt and ſecond, the book of Pſalms, the Proverbs of Solomon, Eccleſiaſtes, the Song of Songs, Job, Iſaiah the prophet, Jeremiah the prophet, Baruch, Ezekiel, Daniel, and the 12 prophets. All together, it is ſaid, the books of the Old Teſtament are 22. The contradicted books are, three books of the Maccabees, the Wiſdom of Solomon, the

Wiſdom of Jeſus, the Son of Sirach, Pſalms, and Odes of Solomon, Eſther, Judith, Suſanna, and Tobit, called alſo Tobias. The inſertion of the book of Baruch, among the ſacred ſcriptures of the Old Teſtament, is the only circumſtance in which this catalogue differs from that of the Jews; but this, and the omiſſion of Eſther, which was not in all ancient catalogues, may be reckoned things of no great conſequence. In the Stichometry prefixed by Cotelerius to the apoſtolical conſtitutions there are 60 books of the Old and New Teſtament, among which are placed 3 books only, which we call Solomon's, the Proverbs, Eccleſiaſtes, and the Canticles; the other two, ſometimes aſcribed to him, Wiſdom and Eccleſiaſticus, are placed with thoſe, which are not of the 60, or contradicted books. Among the 60 there is but one book of Ezra, probably meaning our Ezra and Nehemiah; but among the apocryphal is a book called the Revelation of Ezra. The book of Eſther is not placed among the 60, but in the ſecond claſs of ſuch as were reckoned uſeful. See BIBLE.

The canonical books of the New Teſtament, received by chriſtians in this part of the world, are the Four Goſpels, the Acts of the Apoſtles, 14 Epiſtles of St. Paul, ſeven catholic Epiſtles, and the Revelation. Dr. Lardner ſuggeſts, that the beſt canon of the New Teſtament, is that which may be collected from Euſebius of Cæſarea, and which ſeems to have been the canon of ſome in his time. The canon ſhould conſiſt of two claſſes: the *firſt* conſiſting of thoſe books, called Ομολογȣμενα, which he aſſures us were then univerſally acknowledged, and had been uniformly received, by all catholic chriſtians; theſe are the four goſpels, the Acts of the Apoſtles, 13 epiſtles of St. Paul, one epiſtle of St. Peter, and one epiſtle of St. John. Theſe only ſhould be eſteemed of the higheſt authority, from which doctrines of religion may be proved. The *ſecond* claſs comprehends thoſe books of which Euſebius ſpeaks, called αντιλεγομενα, as contradicted in his time, though well known; concerning which there were doubts, whether they were written by perſons whoſe names they bear, or whether the writers were the Apoſtles of Chriſt. Theſe are the epiſtle to the Hebrews, the epiſtle of James, the ſecond of Peter, the ſecond and third of John, the epiſtle of Jude, and the Revelation. Theſe ſhould be reckoned doubtful, and contradicted; though many might be of opinion, that there is great reaſon to believe them genuine. They ſhould be allowed to be publicly read in chriſtian aſſemblies, for the edification of the people; but not to be alleged, as affording, alone, ſufficient proof of any doctrine. Euſebius reckons a *third* claſs of books of the New Teſtament, called νοϑα, ſpurious; but Dr. Lardner obſerves, that there ſhould be no ſuch third claſs of ſacred books; foraſmuch as there appears not any reaſon from chriſtian antiquity to allow of that character and denomination to any chriſtian writings, beſide thoſe above-mentioned. This canon is a good one, becauſe it is ſhort, and contains only thoſe books, which were acknowledged by all in the time of Euſebius, and from the beginning; and ſeven others, which were then well known, and are next in eſteem to thoſe that were univerſally acknowledged; and were generally received as of more authority than any other controverted writings. Nor is there in them any thing inconſiſtent with the facts, or the principles delivered in the books, univerſally acknowledged. Moreover, there may be a great deal of reaſon to think, that they are the genuine writings of thoſe, to whom they are aſcribed, and that the writers were Apoſtles. No other books, beſide thoſe now generally received by us, ought to be eſteemed canonical, or books of authority. The books contained in this canon, were written by ſeveral perſons, in ſeveral places, and at different times; and it is, therefore, reaſonable to think, that it was formed gradually. At the riſe of the chriſtian religion, there were no written ſyſtems or records of it; nor, indeed, was it fit, that any books ſhould be written about it, till there were converts to receive and keep them, and deliver them to others. In proceſs of time, the writings of the apoſtles and evangeliſts would be reſpectfully received by chriſtian proſelytes, as the written word of God, or ſacred Scriptures. Thoſe who received them would embrace the opportunities that occurred of conveying them to others; and thoſe who received them were fully aſſured of their genuineneſs by thoſe who delivered them. Before the end of the firſt century, or, indeed, not very long after the middle of it, it is likely, there were collections made of the four goſpels, and of moſt of the other books of the New Teſtament, which were in the hands of a conſiderable number of individuals and of churches. From quotations of ſome and from the writings of Irenæus, Clement of Alexandria, Tertullian, and other writers of the ſecond century, of Origen in the third, and of Euſebius in the fourth century, it appears, that moſt of the books, now received by us, and called canonical, were univerſally acknowledged in their times, and had been ſo acknowledged by the elders and churches of former times. And as to the reſt, now received by us, though they were then doubted of, or controverted by ſome, they were well known, and approved by many. Athanaſius alſo, who lived not long after Euſebius, (having flouriſhed from the year 326, and afterwards), received all the ſame books, which are now received by us, and no others. This has been the prevailing ſentiment ever ſince. This canon was not determined by the authority of councils; but the books of which it conſiſts were known to be the genuine writings of the apoſtles and evangeliſts, in the ſame manner that we know the works of Cæſar, Cicero, Virgil, Horace, Tacitus, to be theirs. And the canon has been formed upon the ground of an unanimous, or generally concurring teſtimony and tradition.

That the number of books to be received as ſacred and canonical had not been determined by the authority of any council or councils, univerſally acknowledged, is apparent from the different judgments among Chriſtians, in ſeveral parts of the world, concerning divine books, particularly the Epiſtle to the Hebrews and the Revelation; which were received by ſome, rejected, or doubted of by others. This was alſo the caſe with reſpect to ſome of the catholic epiſtles. No ſuch authority had ſettled the canon of the New Teſtament in the time of Euſebius, becauſe he mentions no ſuch thing. There was no catalogue of the books of Scripture in any canon of the council of Nice, A. D. 325. Auguſtine, A. D. 397, giving directions to inquiſitive perſons, how they might determine what books are canonical, and what not, does not refer to the deciſions of any councils. Caſſiodorus, in the ſixth century, has three catalogues, one called Jerom's, another Auguſtine's, and another that of the ancient verſion; but without reference to the decree of any council, as deciſive. And it ſeems moſt probable, that in all times, Chriſtian people and churches had a liberty of judging for themſelves according to evidence; which evidence, with regard to the genuineneſs of moſt of the books of the New Teſtament, has been ſo clear and manifeſt, that they have been univerſally received. The genuineneſs of theſe books was determined by teſtimony, or tradition. The firſt teſtimony is that of thoſe who were cotemporary with the writers of them; and this teſtimony has been tranſmitted by others. That the primitive Chriſtians formed their judgment concerning the books of Scripture in this way, appears from their remaining works. Inſtances to this purpoſe might be collected from Clement of Alexandria, Tertullian, Origen, Euſebius, Athanaſius, Cyril, Ruſinus, and Auguſtine. But, beſides obſerving the teſtimony of writers in former times, they alſo criticized the books that were propoſed to them; examining their ſtyle and contents, and comparing them with thoſe books which had been already received, as genuine, upon the ground of an unanimous teſtimony, and undoubted tradition. Some indeed have ſaid, that the council of Laodicea, held probably A. D. 363, firſt ſettled the canon of the New Teſtament. But it may be juſtly ſaid to have been ſettled before. At leaſt, ſays Dr. Lardner, there had been long before a general agreement among Chriſtians, what books were canonical and what not. From the decree of the council itſelf it appears, that there were writings already known by the title of canonical. That council, in its laſt canon, merely declares, "that private pſalms ought not to be read in the church, nor any books not canonical, but only the canonical books of the Old and New Teſtament;" after which follows a catalogue or enumeration of ſuch books, in which are rejected the apocryphal books of the Old Teſtament, and the Revelation in the New Teſtament. The 47th canon of the council of Carthage, aſſembled A. D. 397, ordains, "that nothing beſides the canonical Scriptures be read in the church, under the name of divine Scriptures." This council's canon of the New Teſtament is the ſame as that now received, without any other later writings as canonical; though from the manner in which the Epiſtle to the Hebrews is mentioned, there is reaſon to ſuſpect, that it was not ſo generally received as the other 13 epiſtles of St. Paul. "We no where read," ſays Le Clerc (H. E. ann. 100. num. iii. iv. et ann. 29. num. xcii.) "of a council of the apoſtles, or of any aſſembly of the governors of Chriſtian churches, convened to determine by their authority, that ſuch a number of goſpels, neither more nor fewer, ſhould be received. Nor was there any need of it, ſince it is well known to all from the concurring teſtimony of cotemporaries, that theſe four goſpels are the genuine writings of thoſe whoſe names they bear; and ſince it is alſo manifeſt that there is in them nothing unworthy of thoſe to whom they are aſcribed, nor any thing at all contrary to the revelation of the Old Teſtament, nor to right reaſon. There was no need of a ſynod of grammarians, to declare magiſterially what are the works of Cicero, or Virgil. In like manner, the authority of the goſpels has been eſtabliſhed by general and perpetual conſent, without any decree of the governors of the church. We may ſay the ſame of the apoſtolical epiſtles, which owe all their authority, not to the deciſions of any eccleſiaſtical aſſembly, but to the concurring teſtimony of all Chriſtians, and the things themſelves which are contained therein." Upon the whole, we may conclude, that the writings of the apoſtles and evangeliſts are received, as the works of other eminent men of antiquity are, upon the ground of general conſent and teſtimony; nor does the canon of the Scriptures of the New Teſtament owe its eſtabliſhment to the deciſions of councils, but to the judgment of Chriſtian people in general; and the judgment is right and reaſonable.

If we refer to the writings of ancient authors, we ſhall find, that they had the ſame canon of the New Teſtament with that which is generally received in our times. Accordingly, the catalogue of canonical books furniſhed by Origen about A. D. 230; Euſebius, A. D. 315; Athanaſius, A. D. 326; Cyril, A. D. 348; (the book of Revelation excepted); Epiphanius, A. D. 368; Baſil and Gregory Nazianzen, and Amphilochius, A. D. 370; Gregory Nyſſen, A. D. 371; Jerom, A. D. 392; Auguſtine, A. D. 395; Rufinus, A. D. 397; Innocent I. biſhop of Rome, A. D. 402; Iſidore of Peluſium, and Cyril of Alexandria, A. D. 412; Caſſian, A. D. 424; Proſper of Aquitain, and Euſebius, biſhop of Lyons, and Sedulius, A. D. 434; Leo, biſhop of Rome, and Salvian, preſbyter of Marſeilles, A. D. 440; Dionyſius, falſely called the Areopagite, A. D. 490; Gelaſius, biſhop of Rome, A. D. 494; Andrew, biſhop of Cæſarea, A. D. 500; Facundus, an African biſhop, and Arethas, A. D. 540; Caſſiodorius, A. D. 556; Photius, patriarch of Conſtantinople, A. D. 858; Oecumenius, A. D. 950; Theophylact, A. D. 1070; (the Revelations excepted); and Nicephorus Calliſti, A. D. 1325; agrees with that which is now received among Chriſtians. We learn from Paul Sarpi's hiſtory of the council of Trent, that one of the doctrinal articles concerning Sacred Scripture, extracted, or pretended to be extracted out of Luther's works, was this: "that no books ſhould be reckoned a part of the Old Teſtament beſides thoſe received by the Jews: and that out of the New Teſtament ſhould be excluded the Epiſtle to the Hebrews, the Epiſtle of James, the ſecond of Peter, the ſecond and third of John, the Epiſtle of Jude, and the Revelation." And in that council there were ſome biſhops "who would have had the books of the New Teſtament divided into two claſſes; in one of which ſhould be inſerted thoſe books only which had been always received without contradiction; and in the other, thoſe which had been rejected by ſome, or about which at leaſt there had been doubts." Dr. Courayer, in his notes, ſeems to favour this propoſal. See his French tranſlation of the hiſtory of the council of Trent, (l. ii. c. 43. tom. i. p. 235, and c. 47. p. 240. note 1.). Concerning the difference of opinions that have ſubſiſted among ancient and modern writers, with reſpect to the authenticity of particular books, their authors, &c. ſee the titles of thoſe books, Hebrews, Peter, John, James, Jude, and Revelation, or Apocalypſe. For the time of writing the ſeveral books of the New Teſtament, and other particulars relating to them, ſee their reſpective titles. See alſo GOSPEL, ACTS, EPISTLE, and TESTAMENT. Thoſe who wiſh to examine this ſubject more at large, may conſult, beſides the well-known writings of Coſin, Richardſon, Nye, Jones, Lardner, Michaelis, Kennicott, &c. "Gerhardi de Maſtricht Canon Scripturæ ſacræ eccleſiaſticus," Jenæ, 1725; "Schmidii Hiſtoria antiqua et Vindicatio Canonis ſacri V. et N. T." Lipſiæ, 1775, and "Stoſchii Commentatio Hiſtorico-critica de Librorum N. T. Canone," Francof. ad Viadrum, 1755. Such perſons as are acquainted with German literature will find much new and curious information in Dr. Semler's "Freye Unterſuchung," or Free Inquiry into the Canon, 3 vols. 12mo. Halle, 1771—1773; Weber's "Beyträge zur Geſchichte des Kanons," Tübingen, 1791, and in Eichhorn's "Repertorium," vol. v. p. 217.

Some of the fathers have diſtinguiſhed the inſpired writings into three claſſes: proto-canonical, deutero-canonical, and apocryphal; which ſee reſpectively.

CANON, *paſchal*, a table of the moveable feaſts, ſhewing the day of Eaſter, and the other feaſts depending on it, for a cycle of nineteen years. The paſchal canon is ſuppoſed to be the calculation of Euſebius of Cæſarea, and to have been done by order of the council of Nice.

CANON, in *Monaſtic Orders*, a book wherein the religious of every convent have a fair tranſcript of the rules of their order, frequently read among them as their local ſtatutes. This is alſo called regula, as containing the rule and inſtitution of their order. The canon differs from the miſſale, martyrologium, and necrologium.

CANON, again, is uſed for the catalogue of ſaints acknowledged and canonized in the Roman church.

Canon is alſo uſed, by way of excellence, in the Romiſh church, for the ſecret words of the maſs, from the preface to the *Pater*; in the middle of which the prieſt conſecrates the hoſt. The common opinion is, that the canon of the maſs commences with *Te igitur*, &c. The people are to be on their knees, hearing the canon; and are to rehearſe it to themſelves, ſo as not to be heard.

Canon, in *Muſic*, from κανων, *regula*, a rule or law. In ſpeaking of harmonics, in the diviſion of the monochord, it implies the ratio of ſounds, or the proportion of ſound to ſound, when a ſtring is divided by moveable bridges into harmonic intervals. Hence Euclid's celebrated tract on harmonics, as well as Ptolemy's, is called *ſectio canonis*, the ſection of the canon.

But, in muſical compoſition, a *canon* is a law given by one part to another, or to ſeveral parts. As nothing is more difficult to compoſe than *canons*, ſo no ſpecies of compoſition has exerciſed ingenuity, meditation, and labour, in more various ways than the conſtruction of *canons*.

In the uniſon and octave, they are not only more eaſy to compoſe, but are more pleaſing to hear; as all other *canons* are moving in two or three different keys at the ſame time. But *canons* that are eaſy to write, and pleaſing to hear, are in no eſtimation among maſters and profound contrapuntiſts. They have no more reſpect for a *canon* in the uniſon and octave, than a geometrician for a ſum in addition; they regard canons as muſical problems, of which, if the ſolution is eaſy, they are unworthy of notice. They are, in reality, more calculated to exerciſe intellect, than delight the auricular ſenſe.

*Canons* in the 5th or 4th obtain the moſt reverence; but theſe ſervile imitations have been practiſed in the 2d, 3d, 6th, and even the 9th. But rigid fuguiſts call theſe only *imitations*, as the intervals are not ſimilar.

*Canons* were the laſt compoſitions which maſters condeſcended to publiſh in ſcore. They were regarded as enigmas, which required the deepeſt ſagacity and ſcience to unfold. All the ſeveral parts were written on one ſtaff, frequently without ſpecifying when, where, and in what interval the other parts came in. Sometimes, indeed, the compoſer was ſo indulgent as to place this character, 𝄋, over the firſt note of each of the other parts; but without indicating at what diſtance from the *propoſta*, or ſubject, or whether above or below it. At other times the performers were told what kind of *canon* it was, and how reſolved by a Greek or Latin term; that is, on what ſound the *riſpoſta*, or anſwer, was to be made. If in the 4th, 5th, 8th, &c. the words *diateſſaron*, *diapente*, *diapaſon*, &c. occur. If theſe terms are uſed ſimply and unaccompanied, they generally imply that the anſwer is made in ſuch interval above; but if ſome expletive is not added to the interval in which the anſwer is made, the performer is uncertain whether it is above or below the text or ſubject propoſed.

Padre Martini ſays (*Saggio di Contrappunto*) that there are ſo many *canons* ſtill preſerved of the old eccleſiaſtical compoſers, each of which is upon ſome peculiar conſtruction, that it would require a long treatiſe even ſuperficially to explain them.

A *canon* that is written and compoſed in a myſterious and ſingular manner, is called by the Italians *canone chiuſo;* a *canon* in ſcore, or clearly explained, *canone aperto*. A *canon* written only on one line, and ſeemingly in one part or melody, ſometimes has its ſolution pointed out by different clefs and reſts at the beginning. In old compoſers, whether the *riſpoſta* is made above or below the ſubject, is often determined by the Latin particle, *ſuper*, or *ſub*, or by the Greek *hyper*, or *hypo*. So many of the moſt ancient *canons* are locked up in the myſtery of enigmatical inſcriptions or mottos, that the good Padre Martini has collected and explained between 50 and 60 of theſe oracular decrees: ſuch as

1. *Clama ne ceſſes.*
2. *Ocia dant vitia.*
3. *Dii faciant ſine me non moriar ego.*
4. *Omnia ſi perdas famam ſervare memento,*
   *Qua ſemel amiſſa, poſtea nullus eris.*
5. *Sperari & preſtolari multos facit morari.*
6. *Ocia ſecuris inſidioſa nocent.*
7. *Tarda ſolet magnis rebus ineſſe fides.*
8. *Fuge morulas.*

Each of theſe enigmas implies, that the parts which anſwer the leader, are to pay no attention to the reſts, but to ſing the notes without them.

The 12 next enigmas imply nothing more than that the firſt of the two anſwers begins with the firſt note of the ſubject propoſed, and advances ſtraight forward to the end; while the ſecond anſwer begins at the end, and moves backward to the beginning.

It is eaſy enough (ſays M. Ginguené) to conceive the difficulty of conſtructing ſuch *canons*, and how impoſſible it is to divine the author's meaning, if ſome written clue is not given to it; but it is not ſo eaſy to conceive what pleaſure can reſult from the execution of ſuch a taſk, or the merit of taking ſuch great pains for ſo little pleaſure.

Dr. Pepuſch was very fond of theſe muſical myſteries; and the ſtudious and profound Padre Martini, to the end of his life, apologiſed for, and ſtrongly recommended the cultivation of them, to young muſicians, as ſtimuli to meditation and the ſtudy of recondite harmony. A cloſe canon is placed at the head of each chapter of his Hiſtory of Muſic, and whatever contempt and averſion modern faſhionable compoſers may affect for theſe pedantries, no muſician is willing to confeſs his ignorance of any part of the arcana of counterpoint, or to have it thought that he is *incapable* of making a canon; for the regular bred and deep harmoniſts of Italy and Germany ſtill reſpect the old Roman ſchool, and are not only pleaſed with a good fugue or canon, when they hear or ſee it, but add to the number whenever their ſcience and leiſure allow it.

Marpurg defines *canon*, "a muſical compoſition, in which the parts are diſperſed according to the rules of imitation."

In the ancient manner of writing all the ſeveral parts on one ſtaff, the ſolutions were pointed out by a *preſa*, or ſign of reference, 𝄋, or by numbers, indicating when the ſeveral parts come in, placed above or below the five lines, to point out which were above and which below the principal, and ſometimes by the mere title of the *canon*, as *ad diateſſaron*, &c.

Beſides *canon* in equal intervals and notes of equal value, there are others of augmentation and diminution; that is, when the ſubject is repeated by the 2d part in notes of double or of half the length of the firſt. There are canons likewiſe in *moto contrario*, *per arſin et theſin*, which ſee.

*Canons* in different ſpecies of octave, which all muſt be, except thoſe in the uniſon, octave, 4th and 5th, are only *imitations* (which ſee), though the parts move in the ſame kind of notes.

There are alſo canons on two, three, and four ſubjects, difficult to conſtruct, and ſtill more difficult for the hearer to comprehend; they are purely calculated to entertain the eye, but not the ear; as there is too much confuſion for that ſenſe to diſtinguiſh and follow the ſeveral melodies, or enjoy the ingenuity of the deſign. Geminiani has in a concerto of his op. 3ra. a movement in *canon* of four parts, uniſons, and octaves, which uſed to be admired; but he had another in his laſt concertos, op. 7ma. on four different ſubjects, which we believe was never performed in public, it produced ſo much confuſion in private.

To give a liſt of the principal writers on fugue and *canon* would be enumerating all the authors who have written on muſic from the 15th century to the preſent. The rules have been varied but little from Pietro Aron's time, though new contrivances and new enigmas have been multiplied without end.

Compoſition in plain and florid counterpoint ſhould be ſtudied, and its rules and exceptions well digeſted by a muſical ſtudent, before he attaches himſelf to fugue and *canon*, which will make him indifferent about *melody*, provided, under *canonical* reſtrictions, he can make his *harmony* correct.

All that now remains for us to do, in order to ſmooth the way in this kind of ſtudy when the young compoſer thinks it expedient to undertake it, is to give a few ſhort ſpecimens of the principal kinds of *canon* that have been cultivated by great maſters of the old ſchool, when nothing elſe was prized, and all their powers were devoted to that almoſt excluſively.

No writer has more clearly laid down the rules of fugue and *canon* than Dr. Pepuſch, as no one was more deeply read than he was in all the arcana of that kind of lore. Marpurg, Padre Martini, Kirnberger, and ſubſequent writers, may have ſomewhat extended and detailed the rules more minutely than the venerable graduate of one of our univerſities; but as far as he goes, we may ſafely depend on his doctrines. Concerning canon, his precepts are few and ſhort; but of fugues, both precepts and examples are not only numerous, but luminous and indiſputable, which rendered it leſs neceſſary to be diffuſe on *canon*, as the laws of fugue are the laws of *canon*, with reſpect to bringing in the anſwers of the ſeveral parts; and all the ſhort examples of *fugue* in Dr. Pepuſch's treatiſe are almoſt wholly in *canon*.

After fully treating of regular fugue, and its laws, he ſays: "Regular *fugues* are of two ſorts; the one is called by the Italians, *Fuga legata*, and the other *fuga ſciolta*. The firſt ſort is in Engliſh generally called *canon*, and we may expreſs the other by the name of *free fugue*.

"A Canon is that ſort of fugue in which the ſeveral parts ſtrictly contain the *ſame melody* from the beginning to the end; or in which the *guide* and the *anſwers* are, throughout the whole compoſition, exactly *alike*.

"A Free Fugue is not confined to this obligation; for in that we may introduce various ſubjects, different from the theme on which the *fugue* began, and break off alſo at pleaſure; however, *every* ſubject introduced is a *guide*, which muſt have its anſwer in the ſame *ſolmiſation* (intervals) as itſelf; and theſe *freſh ſubjects* muſt alſo be very regularly introduced, according to the *different keys* into which the modulation is brought, and which are *proper* to the *chief key* of the compoſition."

It ſeems as neceſſary for the accents of the anſwers to a canon to fall on the ſame parts of a bar, as in a fugue; particularly in ſetting words. Even in Sala's excellent examples of canon, when the ſubject is led off after a minim reſt in one part, and a ſemibreve reſt in the *riſpoſta*, or reply, the melody is ſo diſguiſed, and there is ſuch confuſion, that there is no canon, nor hardly an imitation, diſcoverable by the ear from the beginning to the end; ſo that all the pains and ingenuity that have been beſtowed on the conſtruction are thrown away; and if there is any melody in the firſt part, it is totally deſtroyed by the ſecond. For eminent writers on *canon*, expreſly, ſee Valentini, Michele, Rocco Rodio, and Bevin.

After all that has been ſaid in this long article, in favour of Canon as an ingenious contrivance, and of its utility among the ſtudies of young muſicians; we muſt own that *canons* which have no other merit than the difficulty of their conſtruction and ſolution, ſhould never ſee the light, being the mere offspring of pedantry and dulneſs; but that ſuch laborious works of this kind as are built on agreeable ſubjects, and are rich in harmony, may, in *ſociety*, afford great pleaſure to real lovers and judges of muſic, cannot be denied.

**Canon** of *Ptolemy*, in *Chronology*, a canon of the Chaldæan, Perſian, Grecian and Roman kings, compiled by Claudius Ptolemæus, who flouriſhed in Egypt in the reigns of Adrian and Marcus Antoninus, about A. D. 150, from the annals and hiſtories of the ſeveral kingdoms to which it relates, and eſteemed an invaluable treaſure in the ſcience to which it is ſubſervient. It has been preſerved in Commentaries of Theon, and publiſhed by Overall and Petavius from two MSS. in the royal library at Paris. In this canon the author computes from the epoch of the Nabonaſſarean æra, and from that day of the month on which the Egyptian Thoth fell. The years made uſe of are Egyptian, and conſiſt of 365 days, without intercalation. In every reign the years are reckoned as complete; and thoſe reigns which are leſs than a year, are omitted, whether they comprehended a Thoth or not. This defect was, in ſome degree, ſupplied by additions to other reigns: yet it appears in hiſtory, that a year was now and then miſreckoned. The firſt part of this canon has been improperly entitled "Ptolemy's Canon of the Kings of the Aſſyrians and Medes," as it includes none but kings of Chaldæa or Babylon.

Canon of *Ptolemy*.

| No. | Kings of Chaldea.<br>Names. | Nab. Years. | Yrs of Reign. | B.C. |
|---|---|---|---|---|
| 14 | Nabonaſſar | 1 | 14 | 747 |
| 16 | Nadius | 15 | 2 | 733 |
| 21 | Chinzirus and Porus | 17 | 5 | 731 |
| 26 | Jugaeus | 22 | 5 | 726 |
| 38 | Mardokempadus | 27 | 12 | 721 |
| 43 | Archians | 39 | 5 | 709 |
| 45 | Firſt inter-reign | 44 | 2 | 704 |
| 48 | Belibus | 46 | 3 | 702 |
| 54 | Apronadius | 49 | 6 | 699 |
| 55 | Regibelus | 55 | 1 | 693 |
| 59 | Meſeſſimordacus | 56 | 4 | 692 |
| 67 | Second inter-reign | 60 | 8 | 688 |
| 80 | Aſaradinus | 68 | 13 | 680 |
| 100 | Saoſduchinus | 81 | 20 | 667 |
| 122 | Chyniladanus | 101 | 22 | 647 |
| 143 | Nabopolaſar | 123 | 21 | 625 |
| 186 | Nabocolaſar, or Nebuchadnezzar | 144 | 43 | 604 |
| 188 | Ilvarodamus, or Evil-Merodach | 187 | 2 | 561 |
| 192 | Niricaſſolazar | 189 | 4 | 559 |
| 209 | Nabonadius | 193 | 17 | 555 |
| | Perſian Kings. | | | |
| 218 | Cyrus | 210 | 9 | 538 |
| 226 | Cambyſes | 219 | 8 | 529 |
| 262 | Darius Hyſtaſpes | 227 | 36 | 521 |
| 283 | Xerxes | 263 | 21 | 485 |
| 324 | Artaxerxes | 284 | 41 | 464 |
| 343 | Darius II. | 325 | 19 | 423 |
| 389 | Artaxerxes II. | 344 | 46 | 404 |
| 410 | Ochus | 390 | 21 | 358 |
| 412 | Arſes | 411 | 2 | 337 |
| 416 | Darius III. | 413 | 4 | 335 |
| 424 | Alexander of Macedon | 417 | 8 | 331 |

| No. | Kings who reigned after Alexander.<br>Names. | Nab. Years. | Yrs of Reign | B.C |
|---|---|---|---|---|
| 431 | Philip Aridæus | 425 | 7 | 324 |
| 443 | Alexander Ægus | 432 | 12 | 317 |
| 463 | Ptolemy Lagus | 444 | 20 | 305 |
| 501 | Ptolemy Philadelphus | 464 | 38 | 285 |
| 526 | Ptolemy Euergetes I. | 502 | 25 | 247 |
| 543 | Ptolemy Philopator | 527 | 17 | 222 |
| 567 | Ptolemy Epiphanes | 544 | 24 | 205 |
| 602 | Ptolemy Philometer | 568 | 35 | 181 |
| 631 | Ptolemy Euergetes II. | 603 | 29 | 146 |
| 667 | Ptolemy Soter | 632 | 36 | 117 |
| 696 | Dionyſius | 668 | 29 | 81 |
| 718 | Cleopatra | 697 | 22 | 52 |
|  | Roman Emperors. |  |  |  |
| 761 | Auguſtus | 719 | 43 | 30 |
|  |  |  |  | A.D. |
| 783 | Tiberius | 762 | 22 | 14 |
| 787 | Caius | 784 | 4 | 36 |
| 801 | Claudius | 788 | 14 | 40 |
| 815 | Nero | 802 | 14 | 54 |
| 825 | Veſpaſian | 816 | 10 | 68 |
| 828 | Titus | 826 | 3 | 78 |
| 843 | Domitian | 829 | 15 | 81 |
| 844 | Nerva | 844 | 1 | 96 |
| 863 | Trajan | 845 | 19 | 97 |
| 884 | Adrian | 864 | 21 | 116 |
| 907 | Antoninus Pius | 885 | 23 | 137 |

Playfair's Chronology, p. 312.

Canon, in *Geometry* and *Algebra*, a general rule for the ſolution of all caſes of a like nature with the preſent inquiry. Thus every laſt ſtep of an equation is a canon; and, if turned into words becomes a rule to ſolve a queſtion of the ſame nature with that propoſed.

Canon, *natural, of triangles*, is a table of ſines, tangents, and ſecants together: ſo called, becauſe ſerving principally for the ſolution of triangles.

Canon, *artificial, of triangles*, is a table wherein the logarithms of ſines and tangents are laid down. See Sine, under which article the method of conſtructing the natural and artificial canon will be explained. See alſo Gunter, Gunter's Line, Scale, and Sector.

Canon *Law*, a collection of eccleſiaſtical conſtitutions, deciſions, and maxims, taken partly from Scripture, partly from the decrees of general and provincial councils, and partly from the decretal epiſtles and bulls of the holy ſee, and the reports and ſayings of the primitive fathers, whereby all matters of policy in the Roman church are regulated.

"If the canon law," ſays Dr. Robertſon (Hiſt. Charles V. vol. i. p. 74, &c. 8vo.) "be conſidered politically, either as a ſyſtem purſued on purpoſe to aſſiſt the clergy in uſurping powers and juriſdiction, no leſs repugnant to the nature of their function, than inconſiſtent with the order of government; or as the chief inſtrument in eſtabliſhing the dominion of the popes, which ſhook the throne, and endangered the liberties of every kingdom in Europe, we muſt pronounce it one of the moſt formidable engines ever formed againſt the happineſs of civil ſociety. But if we contemplate it merely as a code of laws reſpecting the rights and property of individuals, and attend only to the civil effects of its deciſions concerning theſe, we muſt view it in a different, and a much more favourable light." It is not eaſy to fix with preciſion the period at which eccleſiaſtics firſt began to claim exemption from civil juriſdiction. In the early and pureſt ages of the church, they made no pretences to ſuch immunity. The authority of the civil magiſtrate extended to all perſons, and to all cauſes. But in ages of ignorance and credulity, the miniſters of religion became objects of ſuperſtitious veneration. Accordingly we find in Tacitus, (de Mor. Germ.) that prieſts were highly reverenced by the Germans, and that they preſided in the aſſembly of the people. They alone were permitted to chaſtiſe, to bind, and to ſmite; which they did, not by order of the prince, or as his miniſters of juſtice; but as by an inſpiration of that Deity, who is always preſent to thoſe who make war. When the barbarians who over-ran the empire firſt embraced the Chriſtian faith, they found the clergy in poſſeſſion of conſiderable power, and they naturally transferred to theſe new guides the profound ſubmiſſion and reverence which they had been accuſtomed to yield to the prieſts of that religion which they had forſaken. The clergy, whoſe function was regarded as ſacred, availing themſelves of the advantage which the ſuperſtition and credulity of mankind afforded them, gradually emancipated themſelves from ſubjection to the profane juriſdiction of the laity and to civil courts; and extended that indulgence which ſeems at firſt to have been merely an act of complaiſance, flowing from veneration of their character, into a legal exemption. Hence they proceeded to eſtabliſh courts, in which every queſtion relating to their own character, their function, or their property, was tried. Upon different pretexts, and by a multiplicity of artifices, they communicated this privilege to ſo many perſons, and extended their juriſdiction to ſuch a variety of caſes, that moſt concerns which gave riſe to litigation were drawn under the cognizance of the ſpiritual courts.

Du-Cange, in his Gloſſary (Voc. *Curia Chriſtianitatis*) has collected moſt of the cauſes with reſpect to which the clergy arrogated an excluſive juriſdiction, and refers to the authors, or original papers, which confirm his obſervations. Giannoni, in his Civil Hiſtory of Naples, (l. xix. § 3.) has ranged theſe under their proper heads, and ſcrutinizes the pretenſions of the church with his uſual boldneſs and diſcernment. M. Fleury obſerves, (Hiſt. Eccleſ. tom. xix. Diſc. Prelim.) that the clergy multiplied, at ſuch a rate, the pretexts for extending the authority of the ſpiritual courts, that it was in their power to withdraw every perſon and every cauſe from the juriſdiction of the civil magiſtrate. The ambitious project of erecting a ſpiritual monarchy, ſuperior to all others, even in worldly power, was manifeſted by the whole conduct of the biſhops of Rome, and of the clergy connected with them, both before and after the period in which the canon law was introduced. This appeared in the canons enacted by their councils for the government of that monarchy; and it was very ſignally diſplayed in the canons of the provincial ſynod, held at Merton in Surrey, A. D. 1258, by Boniface, archbiſhop of Canterbury. The firſt canon of that ſynod forbids archbiſhops, biſhops, and inferior clergy, to appear before civil courts to anſwer for any part of their conduct which had the moſt remote relation to church affairs; and threatens the judges, and even the king himſelf, with the higheſt cenſures of the church, if they inſiſt on ſuch appearance. The ſecond relates to patronages; and the third is againſt the intruſion of clerks into benefices by a lay power. The fourth makes ſuch regulations concerning excommunication, as rendered that ſentence truly terrible. The fifth forbids laymen to impriſon clergymen. In the ſixth, the church claims a right of judging concerning contracts between a clergyman and a layman. The ſeventh aſſerts a right of the church to judge and puniſh Jews. The eighth provides for the perfect ſecurity of thoſe criminals who had taken refuge in churches. The ninth, tenth, and eleventh, are deſigned to prevent all invaſions of every kind in the poſſeſſions of the church and clergy, which are declared ſacred and inviolable. And the two laſt provide for the church's peaceable enjoyment of all pious legacies and donations. The viſible tendency of all ſuch canons was to emancipate the church and clergy from civil authority. We need not wonder then that the laity ſhould be alarmed at ſuch proceedings, whenever they occurred, and by the ambitious ſpirit which they indicated. In order, therefore, to diſpoſe the laity to ſubmit to uſurpations of this kind without oppoſition or murmur, it was neceſſary to convince them, that the adminiſtration of juſtice would be rendered more perfect by the eſtabliſhment of this new juriſdiction. Accordingly, howſoever ill-founded the juriſdiction of the clergy may be, and whatever might be the abuſes to which their manner of exerciſing it gave riſe, the principles and forms of their juriſprudence were far more perfect than that which was known in the civil courts. The eccleſiaſtics, probably, had never ſubmitted, during any period of the middle ages, to the laws contained in the codes of the barbarous nations, but were governed entirely by the Roman law. They regulated all their tranſactions by ſuch of its maxims as were preſerved by tradition, or were contained in the Theodoſian code, and other books extant among them. The clergy conſidered it as ſuch a valuable privilege of their order to be governed by the Roman law, that, when any perſon entered into holy orders, it was uſual for him to renounce the laws to which he had been formerly ſubject, and to declare that he now ſubmitted to the Roman law. Beſides, whatever knowledge of ancient juriſprudence had been preſerved, either by tradition or in ſuch books as had eſcaped the deſtructive rage of barbarians, was poſſeſſed only by the clergy. Upon the maxims of that excellent ſyſtem, they founded a code of laws conſonant to the great principles of equity. Being directed by fixed and known rules, the forms of their courts were aſcertained, and their deciſions became uniform and conſiſtent. Nor did they want authority ſufficient to enforce their ſentences. Excommunication, and other eccleſiaſtical cenſures, were puniſhments more formidable than any that civil judges could inflict in ſupport of their decrees. It is not ſurpriſing, then, that eccleſiaſtical juriſprudence ſhould become an object of admiration and reſpect; and that exemption from civil juriſdiction was courted as a privilege, and conferred as a reward. Nor is it ſurpriſing, that even to rude people the maxims of the canon law ſhould appear more equal and juſt than that ill-digeſted juriſprudence which directed all proceedings in the civil courts. According to the latter, the differences between contending barons were terminated by the ſword; according to the former every matter was ſubjected to the deciſion of the laws. The one permitted judicial combats; the other paſſed judgment with reſpect to theſe by the maxims of equity, and the teſtimony of witneſſes. Moreover, the eccleſiaſtical law eſtabliſhed a gradation of courts, through all which a cauſe might be carried by appeal until it was determined by that authority which was held ſupreme in the church. The canon law ſuggeſted other improvements beneficial to ſociety. Many of the regulations, that are now deemed the barriers of perſonal ſecurity, or the ſafeguards of private property, are contrary to the ſpirit, and repugnant to the maxims of the civil juriſprudence, known in Europe during ſeveral centuries, and were borrowed from the rules and practice of the eccleſiaſtical courts. By obſerving the wiſdom and equity of the deciſions in theſe courts men began to perceive the neceſſity either of deſerting the martial tribunals of the barons, or of attempting to reform them. So high in eſtimation was the juriſprudence of the canon law above that which was exerciſed in law-courts, that one of the moſt conſiderable immunities propoſed to thoſe who engaged in the dangerous expeditions for the Holy Land, was the declaring of thoſe who took the croſs to be ſubject only to the ſpiritual courts. Du Cange, Gloſſ. voc. *Crucis Privilegia.* It was not till after the publication of the decretals of Gratian, about the middle of the 12th century, that the canon law attained the rank of a ſcience, and was taught and ſtudied in the ſchools. It ſoon after became the moſt faſhionable ſtudy among the clergy, and paved their way to the higheſt honours and richeſt benefices. About the cloſe of the 12th, or beginning of the 13th century, it was taught with great applauſe and profit at Oxford, Paris, Orleans, and many other places. We may here obſerve, that the compilation of the canon law by Gratian, and the ſubſequent union of the canon law with theology and philoſophy contributed, among other cauſes, to the prevention of the revival of knowledge. Although this compilation was made without judgment, under the authority of Frederic I., it became a body of eccleſiaſtical juriſprudence, which the clergy were required to ſtudy and obſerve. This code was even made an authoritative guide in moral doctrine and diſcipline, and prevented the ſtudy of ethics, till the middle of the 15th century, when the morals of Ariſtotle were again permitted to be read. But the worſt evil was, that they who had framed the unnatural union of canon law, ſcholaſtic philoſophy and theology, finding it exceedingly conducive to their own emolument, reſolutely oppoſed all innovations, and proſcribed with their whole authority all thoſe learned men, who had the boldneſs to attempt further improvements in philoſophy.

The firſt “Syntagma” of canon law was compoſed by John the Scholaſtic, a prieſt of Antioch, in the ſixth century. He is alſo the author of the “Nomo-Canonon.” Both were publiſhed at Paris in Juſtelle's “Bibliotheca Juris Canonici,” tom. ii. In the ninth century, the celebrated Photius compiled his “Syntagma Canonum,” and his “Nomo-Canonon.” The former has not been publiſhed; but the latter was given with a Latin verſion and Balſemon's commentary, by Juſtelle, at Paris, 1615.

The canon law that obtained throughout the Weſt, till the twelfth century, was the collections of canons, “Codex canonum,” compiled by Dionyſius Exiguus, in 520, and publiſhed by Juſtelle in 1628, and improved by Iſidore of Seville, who appropriated them to the diſcipline of Spain; the capitularies of Charlemagne, and the decrees of the popes, from Siricius to Anaſtaſius.—No regard was had to any thing not compriſed in theſe; and the French have ſince maintained the rights of the Gallican church to conſiſt in their not being obliged to admit any thing elſe, but to be at liberty to reject all innovations made in the canonical juriſprudence ſince that compilation, as well as papal decrees before Siricius.

Indeed, between the eighth and eleventh centuries, the canon-law was mixed and confounded with the papal decrees from St. Clement to Siricius; which till then had been unknown: this gave occaſion to a new reform, or body of the canon-law, or harmony of diſcordant canons; which is the collection ſtill extant, under the title of “Concordia Diſcordantium Canonum,” firſt made by Ivo, in 1114, and perfected in 1151, by Gratian, a Benedictine monk, from texts of Scripture, councils, and ſentiments of the fathers, in the ſeveral points of eccleſiaſtical polity; and containing thoſe conſtitutions which have been denominated, by way of eminence, the DECREES, and forming the firſt part of the canon-law. Theſe are the moſt ancient, as they commence from the time of Conſtantine, the firſt Chriſtian emperor of Rome, and they reached as low as the time of pope Alexander III. It is now generally known by the name of the “Decretum” of Gratian, which was formed in imitation of the Pandects of Juſtinian; and is a confuſed immethodical compilation, full of errors and forgeries.

The ſecond part of the canon-law conſiſts of the decrees of the popes, from the time of pope Alexander III. to pope Gregory IX. and publiſhed, under the auſpices of that pope, by Raymundus Barcinius, about the year 1230, in five books, entitled "Decretalia Gregorii Noni."

In 1298, pope Boniface VIII. continued the papal decrees as far as his time, under the title of "Sextus Decretalium." To theſe, pope John XXII. added the "Clementines," or the conſtitutions of his predeceſſor Clement V. approved by the council of Vienne, and firſt authenticated about the year 1317. And to all theſe were afterwards added twenty conſtitutions of the ſaid pope John, called the "Extravagantes;" and ſome other conſtitutions of his ſucceſſors, called "Extravagantes Communes." Theſe are uſually called the DECRETALS.

All theſe, viz. Gratian's decree, Gregory's decretals, the ſixth decretal, the Clementine conſtitutions, and the extravagants of John and his ſucceſſors, form the "Corpus Juris Canonici," or body of the Roman canon-law; which, including the comments, make three volumes, in folio; the rule and meaſure of church government. As the *decrees* ſet out the origin of the canon law, and the rights, dignities, and decrees of eccleſiaſtical perſons, with their manner of election, ordination, &c. ſo the *decretals* contain the law to be uſed in the eccleſiaſtical courts; and the firſt title in every one of them is the title of the bleſſed Trinity, and of the catholic faith, which is followed with conſtitutions and cuſtoms, judgments and determinations in ſuch matters and cauſes as are liable to eccleſiaſtical cognizance, the lives and converſation of the clergy, of matrimony and divorces, inquiſition of criminal matters, purgation, penance, excommunication, &c. But ſome of the titles of the canon-law are now out of uſe, and belong to the common law; and others are introduced, ſuch as trials of wills, baſtardy, defamation, &c. Beſide theſe pontifical collections, which during the times of popery were received as authentic in this iſland, as well as in other parts of Chriſtendom, there is alſo a kind of national canon-law, compoſed of *legatine* and *provincial* conſtitutions, and adapted only to the exigencies of this church and kingdom. See CONSTITUTIONS. At the dawn of the reformation, in the reign of Henry VIII. it was enacted, that the canon-law ſhould be reviewed; and till that review took place, ſuch canons, conſtitutions, ordinances, and ſynodals provincial as had been made, and were not repugnant to the law of the land or the king's prerogative, ſhould ſtill be uſed and executed. The review was propoſed again in the reign of Edward VI. and of queen Elizabeth; but as it was never accompliſhed, the authority of the canon-law in England depends upon the ſtatute of the 25th Henry VIII. c. 19. which was repealed indeed by queen Mary, and again revived and confirmed by 1 Eliz. c. 1.

As to the conſtitutions and canons made in the convocation of the province of Canterbury in 1603, ratified by the king, and ſoon after adopted in the province of York; theſe never obtained a parliamentary confirmation; and it has been therefore adjudged upon the principles of law and the conſtitution, that where they are not merely declaratory of the ancient canon-law, but are introductory of new regulations, they do not bind the laity, however the clergy may regard them. Strange's Rep. 1057.

Lord Hardwicke cites the opinion of Lord Holt, and declares it is not denied by any one, that it is very plain all the clergy are bound by the canons, confirmed merely by the king; but they muſt be confirmed by the parliament to bind the laity. 2 Atk. 605. There are four ſpecies of courts, in which the canon (and civil) laws are permitted, under different reſtrictions, to be uſed. 1. The courts of the archbiſhops and biſhops, and their derivative officers; uſually called in our law courts Chriſtian, or the eccleſiaſtical courts. 2. The military courts, or courts of chivalry. 3. The courts of Admiralty. 4. The courts of the two univerſities. Their reception in general, and the different degrees of their reception in all theſe courts, are grounded entirely upon cuſtom; corroborated with regard to univerſities by act of parliament ratifying thoſe charters, which confirm their cuſtomary laws. Dr. Blackſtone (Com. vol. i. p. 84.) ſubjoins the following remarks, relating to all theſe courts. 1. The courts of common law have the ſuperintendency over theſe courts; to keep them within their juriſdiction, to determine wherein they exceed them, to reſtrain and prohibit ſuch exceſs, and in caſe of contumacy, to puniſh the officer who executes, and in ſome caſes the judge who enforces, the ſentence ſo declared to be illegal. 2. The common law has reſerved to itſelf the expoſition of all ſuch acts of parliament, as concern either the extent of theſe courts or the matters depending before them. And, therefore, if theſe courts either refuſe to allow theſe acts of parliament, or will expound them in any other ſenſe than what the common law puts upon them, the king's courts at Weſtminſter will grant prohibitions to reſtrain and control them. 3. An appeal lies from all theſe courts to the king, in the laſt reſort; which proves, that the juriſdiction exerciſed in them is received from the crown of England, and not from any foreign potentate, or intrinſic authority of their own. From theſe three ſtrong marks and enſigns of ſuperiority, it appears beyond a doubt, that the civil and canon laws, though admitted in ſome caſes by cuſtom in ſome courts, are only ſubordinate, and "leges ſub graviori lege;" and that, thus admitted, reſtrained, altered, new-modelled, and amended, they are by no means with us a diſtinct independent ſpecies of laws, but are inferior branches of the cuſtomary or unwritten laws of England, properly called the king's eccleſiaſtical, the king's military, the king's maritime, or the king's academical laws. See COURT.

CANON *Religioſorum*, in *Eccleſiaſtical Antiquity*, a book in which the religious of convents had a fair tranſcript of the rules of their order, which were frequently read among them as their local ſtatutes; and on this account it was called their "regula," or "canon." The public books of the religious were the four following: 1. "Miſſale," containing all their offices of devotion. 2. "Martyrologium," or a regiſter of their peculiar ſaints and martyrs, with the place and time of their paſſion. 3. "Canon," or "regula," which included the inſtitution and rules of their order. 4. "Necrologium," or "Obituarium," in which they entered the deaths of their founders and benefactors, that they might obſerve the proper days for commemorating them. Kennet's Gloſſ.

CANONARCHA, or CANONARCHUS, a dignity in the Greek church, anſwering to the PRECENTOR in the Latin, or CHANTER in the Engliſh church. The word is formed from κανων and αρχη, *beginning*, or *governing*; becauſe it belongs to this officer to ſet the canons, or church hymns, and to direct the choir in ſinging them. A like officer we alſo find in the ancient monaſteries, under the denomination canonarcha, whoſe buſineſs was to beat the ſemantium, or wooden inſtrument, whereby the monks were called to choir to ſing canons. There appear to have been ſeveral canonarchæ in the ſame monaſtery.

CANONE *al ſoſpiro*, in the Italian *Muſic*, a canon, the parts of which ſucceed each other by a *ſoſpiro*, that is, the time of a crotchet.

**CANONESS**, in the *Romiſh Church*, a woman who enjoys a prebend, affixed, by the foundation, to maids; without their being obliged to renounce the world, or to make any vows. There are few of theſe, except in Flanders and Germany; they are rather looked upon as a ſeminary and retreat of girls for marriage than an engagement for the ſervice of God.

Canonesses *of St. Auguſtine*, or *Regular* Canonesses, are a kind of religious, who follow the rules of St. Auguſtine, of which there are various congregations. The order of canoneſſes was firſt inſtituted by Lewis the Meek, in the beginning of the ninth century.

**CANONGOES**, in *Modern Hiſtory*, a denomination given in Bengal to the regiſters of land, and hereditary expounders of the uſages of the country. They have every where their officers and deputies, and are not liable to removal: and all papers atteſted by them are received as authentic and deciſive in diſputes concerning lands and their boundaries.

**CANONHERIUS**, Peter, Andrew, in *Biography*, the ſon of a phyſician of eminence at Genoa, under whom he received the rudiments of his education, which he completed at Parma, where he applied with equal induſtry to the ſtudy of medicine and juriſprudence. In 1604, probably on his being created doctor in philoſophy, medicine, and theology, he publiſhed at Parma "Concluſiones philoſophicæ et medicæ," 4to. and the ſame year "De admirandis Vini Virtutibus," 8vo. Antwerp; in 1607, "De Curioſa Doctrina Libri quinque," 4to. Florentiæ. But his principal work is, "In ſeptem Aphoriſmorum Hippocratis Libros, medicæ, politicæ, morales, ac theologicæ Interpretationes," Ant. 1618, 2 tom. 4to. But the labour of the author has rather obſcured, than elucidated the texts he meant to explain. Haller Bib. Med. Eloy. Dict. Hiſt.

**CANONICA**, in *Philoſophical Hiſtory*, an appellation given by Epicurus to his doctrine of logic. It was called canonica, as conſiſting of a few canons, or rules, for directing the underſtanding in the purſuit and knowledge of truth: and it is repreſented as a very ſlight and inſufficient logic, by ſeveral ancients who put a great value on his ethics and phyſics. The ſtreſs of Epicurus's canonica conſiſts in his doctrine of the criteria of truth. All queſtions in philoſophy are either concerning words or things: concerning things, we ſeek their truth; concerning words, their ſignification: things are either natural or moral; and the former are either perceived by ſenſe, or by the underſtanding. Hence, according to Epicurus, ariſe three criterions of truth, viz. ſenſe, anticipation or prænotion, and paſſion. The great canon, or principle, of Epicurus's logic is, that the ſenſes are never deceived; and therefore, that every ſenſation, or perception of an appearance, is true. Stanley's Hiſt. Phil. p. xiii. p. 35. See Epicurean *Philoſophy*.

Canonica is alſo uſed by ſome ancients to denote the art of muſic: and it is more particularly uſed to denote that ſpecies of muſic, which does not determine the intervals of ſounds by the ear, but by a canon or ſtretched chord. See Canon.

**CANONICAL**, ſomething that belongs to, or partakes of the nature of a rule or canon: and amounts to much the ſame with what we otherwiſe call regular.

Canonical is an appellation more peculiarly given to thoſe writings which have been received as the rule of our faith and practice, and comprehended in the canon or catalogue of the Scriptures. In which ſenſe, canonical ſtands contradiſtinguiſhed from apocryphal. Divines generally hold, that thoſe books only of the New Teſtament are to be accounted canonical, which were either written, or at leaſt approved and authorized by the apoſtles. Formerly they were not ſo well diſtinguiſhed as among us. In the firſt ages of the church, Dodwell obſerves the genuine writings of the apoſtles uſed to be bound up together with thoſe now called ſpurious, and apocryphal; ſo that it was not manifeſt, by any public judgment, which of them was to be preferred to the other; but later times thought fit to make a ſeparation.

The Jews allow of no books for canonical, but thoſe written before or ſoon after the return from the Babyloniſh captivity, when the gift of prophecy ceaſed among them. In determining the queſtion, what books are canonical, and what are apocryphal, ſome have had recourſe to the authority of the church. Accordingly, the papiſts have generally affirmed, in their controverſies with the proteſtants, that the authority of the Scriptures depends upon, or is derived from the power of the church; or, in other words, that it is in the power of the pope, or council, or both, to determine what books ſhall be received as canonical. Others are of opinion, that there are innate evidences in the Scriptures themſelves, which, applied by the illumination or teſtimony of the Holy Spirit, are the only true proofs of their being canonical, or the word of God. The inſufficiency of theſe two modes of deciſion has been examined and evinced by ſeveral writers, and particularly Mr. Jones, *ubi infra*. The principal, and without doubt, moſt unexceptionable and ſatisfactory method by which this queſtion can be determined, is tradition, or the well-approved teſtimonies of thoſe who lived in, or near the time when the books ſuppoſed to be canonical, were written. To this purpoſe Mr. Jones alleges, that the ſeveral books of the New Teſtament, at their firſt writing, were publiſhed abroad to the world, and delivered to the firſt churches in diſtant countries, for their uſe; and they who firſt received them knew them to be the books of the perſons under whoſe names they were publiſhed, and could, and did teſtify to the ſucceeding ages, what they thus knew of the facts. This teſtimony of the primitive churches is ſtill faithfully preſerved in the writings of the ancient Chriſtians, and is, therefore, not only a good and ſufficient, but the principal means by which we know the truth of the fact, viz. that the books were written by ſuch and ſuch men. Beſides, the books contain in themſelves evidences of their excellency above all others, which ſhould ſerve to confirm our faith; and, for our farther help, we may hope to obtain the influences of God's Holy Spirit, to clear our judgments, and free us from prejudices, to help us to perceive the former evidences in their due ſtrength, and ſo to impreſs the things revealed on our minds, as to produce a ſuitable conduct. Moreover, thoſe books which are mentioned in the catalogues made by the moſt ancient Chriſtian writers of the ſacred and inſpired books, are to be eſteemed canonical, and thoſe which are not found in any of theſe catalogues, muſt be conſidered as apocryphal. And farther, thoſe books are juſtly eſteemed canonical, which the firſt writers of Chriſtianity have cited in their writings as Scripture, and thoſe apocryphal which they have not ſo cited. Beſides, thoſe books are canonical, which the primitive Chriſtians read in their churches, or public aſſemblies, as the Scriptures or word of God. Jones's new and full Method, &c. vol. i. See Canon and Apocryphal.

Canonical, *poſt*, or *deutero*-Canonical. See Canon, and Deutero-*Canonical*.

Canonical is alſo an appellation given to thoſe epiſtles in the New Teſtament, more frequently called catholic, or general epiſtles.

Canonical, *canonicus*, was alſo an appellation given to all the officers and miniſters of a church or monaſtery, from the biſhop or abbot to the meaneſt ſervant, including prieſts, monks, virgins, and all who were entered in canon, that is, in the matricula or regiſter of the church.

Canonical *horſes*, *canonici equi*, was an ancient tax, or tribute, impoſed on certain provinces, whereby they were obliged to furniſh the emperor with ſo many horſes to mount his cavalry.

Canonical *hours*, are certain ſtated times of the day, conſigned, more eſpecially by the Romiſh church, to the offices of prayer and devotion. Such are *matins*, *lauds*, *ſixth*, *ninth*, *veſpers*. In our country the canonical hours are from eight to twelve in the forenoon, before or after which marriage cannot be legally performed in any pariſh-church.

Canonical *inſtitution*, a regular and legitimate collation to a benefice, agreeable to the rules of the canon-law.

Canonical *letters*, in the *Ancient Church*, were a ſort of teſtimonials of the orthodox faith, which the biſhops and clergy ſent each other, to keep up catholic communion, and diſtinguiſh orthodox Chriſtians from Arian, and other heretics. When they had occaſion to travel into other dioceſes, or countries, dimiſſory and recommendatory letters, alſo letters of peace, &c. were ſo many ſpecies of *canonical letters*. See Dimissory.

Canonical *liberty*, a freedom to which certain churches are left, being governed by the ancient canons and uſages eſtabliſhed before the papal hierarchy was carried to its height: ſuch is that which, of later days, the French call the *Gallican liberty*.

Canonical *life*, the method or rule of living preſcribed by the ancient clergy who lived in community. The canonical life was a kind of medium between the monaſtic and clerical lives.

The orders of monks aud clerks were originally diſtinct; but, in proceſs of time, pious perſons inſtituted colleges of prieſts and canons, where clerks, actually engaged in the miniſtry, or admitted for it, might live under a fixed rule, which, though ſomewhat more eaſy than that of the monks, was nevertheleſs more reſtrained than the ſecular. This was called the "canonical life;" and thoſe who embraced it, "canons." Authors are not agreed concerning the founder of the canonical life. Some aſcribe it to the apoſtles; others refer it to pope Urban I. about the year 1230, who is ſaid to have ordered biſhops to provide ſuch of their clergy as were willing to live in community with neceſſaries out of the revenues of their churches. Moſt writers aſcribe it to St. Auguſtine, who, having engaged a number of clerks to devote themſelves to religion, inſtituted a monaſtery within his epiſcopal palace, where he lived in community with them. Onuphrius Panvinius ſays, that pope Gelaſius I., about the year 495, placed ſix regular canons of St. Auguſtine in the Lateran church.

Canonical *obedience*, is that ſubmiſſion which by the eccleſiaſtical laws the inferior clergy are to pay to their biſhops, and religious, to their ſuperiors.

Canonical *portion*, ſo much of the effects of a perſon deceaſed, as the canons allow to the pariſh church to which he belonged.

Canonical *puniſhments* are thoſe which the church may inflict: ſuch are excommunication, degradation, and penance, in Roman catholic countries; alſo faſting, alms, whipping, &c.

Canonical *purgations*, were ancient methods of proving innocency by ordeal, purgation, &c. See alſo Compurgation, Oath, &c.

Canonical *ſins*, in the *Ancient Church*, thoſe which were capital or mortal: ſuch eſpecially were idolatry, adultery, murder, hereſy, and ſchiſm.

CANONICUM, in a general ſenſe, denotes a tax, or tribute.

Canonicum is more particularly uſed in the Greek church for a fee paid by the clergy to biſhops, archbiſhops, and metropolitans, for degrees and promotions.

Canonicum alſo denotes a due of firſt-fruits, paid by the Greek laity to their biſhops, or, according to Du-Cange, to their prieſts. The canonicum is aſſeſſed according to the number of houſes, or chimnies, in a place.

The emperor Iſaac Comnenus made a conſtitution for regulating the canonicum of biſhops, which was confirmed by another made in 1086, by his nephew Alexis Comnenus. A village containing thirty fires, was to pay for its canonicum, one piece of gold, two of ſilver, one ſheep, ſix buſhels of barley, ſix of wheat-flour, ſix meaſures of wine, and thirty hens. Du Cange, Gloſs. Gr. tom. i. p. 578.

CANONIST, a perſon ſkilled in, or who makes profeſſion of, the ſtudy and practice of the canon-*law*.

Canoniſts and civilians are uſually combined in the ſame perſons. And hence the title of *doctor juris utriuſque*, or *legum doctor*, uſually expreſſed in abbreviature, LL. D. or J. U. D.

CANONIUM, in *Ancient Geography*, a place of the iſle of Albion, on the route from Venta Icenorum to Londinium, between Camoladunum and Cæſaromagus, according to Antonine's Itinerary. Mr. Camden has placed this ſtation at Chelmsford, and Dr. Gale hath fixed it at Little Canfield.

CANONIZATION, a declaration of the pope, whereby, after a great deal of ſolemnity, he enters into the liſt of ſaints ſome perſon who has lived an exemplary life, and wrought miracles; or, as is often the caſe, performed ſome ſingular ſervice for the church, in which a principal part of this kind of merit conſiſts. See Beatification.

The word *canonization* ſeems to be of later origin than the thing; there being no inſtance of the uſe of the word before the twelfth century, whereas St. Uldaricus was canonized in the tenth. The term is formed from *canon;* becauſe the primitive canonizations were only orders of the popes, or biſhops, whereby perſons eminent for piety, &c. were inſerted in the canon of the maſs, that they might be commemorated in the ſervice: becauſe, in thoſe days, the uſe of martyrologies was unknown in the church. Mabillon diſtinguiſhes two kinds of canonization; a *general*, and *particular*; the firſt made by a general council, or a pope; the ſecond, by a biſhop, a particular church, or a provincial council. There are inſtances likewiſe of canonizations, or at leaſt of ſomething very like them, by abbots.

At firſt, only martyrs were canonized; but by degrees they came to confeſſors, &c.

Canonization anciently conſiſted in inſerting the ſaint's name in the ſacred diptychs, or canon of ſaints; in appointing a proper office for invoking him, and erecting churches under his invocation, with altars for maſs to be celebrated on; taking up the body from the place of its firſt burial, and the like ceremonies: by degrees, other formalities were added; and proceſſions were made with the ſaint's image in triumph; the day of his death was declared a feaſt; and to render the thing ſtill more ſolemn, Honorius III. in 1225, added ſeveral days indulgence to a canonization.

It is a great diſpute among the learned, when the right of canonization, which it is owned was anciently common to ordinaries, eſpecially metropolitans and princes, with the pope, became firſt peculiar to the pope. Some ſay, Alexander III. made this reſerve to the holy ſee. The Jeſuits of Antwerp, in their Propylæum, aſſert, it was not eſtabliſhed till two or three ages ago; and then by a mere cuſtom, which paſſed tacitly into a law; which appears not to have been generally received in the tenth and eleventh centuries. This, however, is pretty certain, that it was generally allowed before pope Alexander III.; but ſince his time we read of no ſaints canonized by any but the popes, to whom he is ſaid to have reſtricted the privilege and cognizance of canonization: and the archbiſhop of Vienne in France, and his ſuffragans, acknowledge it in an authentic manner in the year 1231, by a letter written to Gregory IX. deſiring him to canonize Stephen, biſhop of Die, who died in 1208. "Quia nemo," ſay they, "quantalibet meritorum prærogativa polleat, ab eccleſia Dei pro ſancto habendus, aut venerandus eſt, niſi prius per ſedem apoſtolicam ejus ſanctitas fuerit approbata."

CANONNICAT, in *Geography*, a ſmall iſland of North America, in Newport county, Rhode iſland, extending ſouth nearly as far as the ſouth end of Rhode iſland, and north about ſeven miles, its average breadth being about one mile; the ſouth ſhore forming the weſt point of Newport harbour, and the weſt ſhore being about three miles from the Narraganſet ſhore. On this point is Jameſtown. It was purchaſed of the Indians in 1657, and in 1678 incorporated by the name of Jameſtown. The ſoil is luxuriant, producing grain and graſs in abundance. Jameſtown contains 507 inhabitants, including 16 ſlaves.

CANONNIERE is a ſmall loophole or opening made in a wall, for firing through with a muſquet or fuſee. Thus canoniere de retranchemens are openings made in the ſoldiers' huts or cabins, for firing through on the enemy. The word is not now in general uſe, that of *craneau* being ſubſtituted in its ſtead. The name of *canoniere*, however, was formerly given to embrazures.

Canonniere is alſo a ſort of tent, in which infantry and cavalry lodge on a campaign. One of them, like a hut or cabin, holds ſeven men. They are of different ſorts and ſizes, according as they are intended for the accommodation of infantry, cavalry, ſuttlers, ſervants, and officers. For a deſcription of their forms or figures, ſee the article Castrametation.

CANONRY, or Canonicate, the benefice filled by a canon. Canonicate is diſtinguiſhed from prebend, in that the prebend may ſubſiſt without the canonicate, whereas the canonicate is inſeparable from the prebend. It is to the canonicate, not to the prebend, that the right of ſuffrages, and other privileges, are annexed. See Prebend.

CANONSBURY, in *Geography*, a town of North America, in Waſhington county, Pennſylvania, pleaſantly ſituated on riſing ground, near the north ſide of the weſt branch of Chartier's creek, 18 miles S.W. from Pittſburg, and 9 miles N.E. from Waſhington. It contains about 100 houſes, and two meeting-houſes, one belonging to the Preſbyterians and the other to the Seceders. Its academy is flouriſhing, and a charter was lately granted in the ſeſſion of the aſſembly for a college. In its vicinity are ſeveral valuable mills.

CANOPICUM, in *Ancient Geography*, a town of Africa Propria, ſituate between the town of Tabraca and the river Bagradas. Pliny ſays, that it was inhabited by Roman citizens. It is the "Canopiſſæ" of Ptolemy.

CANOPUS, in *Aſtronomy*, a bright ſtar of the firſt magnitude in the rudder of Argo, a conſtellation of the ſouthern hemiſphere. See Argo.

The longitude of *Canopus*, as given by Halley, for the year 1700, is 10° 52′ of Cancer, and its ſouthern latitude, 72° 49′. F. Noel, in 1697, found its right aſcenſion 93° 54′, its declination ſouthwards, 52° 29′. F. Feuille, in the beginning of March 1709, obſerved the declination of *canopus* 52° 30′ 4″. F. Thomas, in January 1682, found the declination 52° 31′ 33″, its right aſcenſion 93° 32′ 20″, longitude, 8° 52′, of Cancer, latitude ſouthern, 75° 55′. Wolf. Lex. Math. p. 303, ſeq. Mem. Acad. Scienc. ann. 1693, p. 390, ſeq.

Canopus, is alſo a name given by ſome of the old aſtronomers to a ſtar under the ſecond bend of Eridanus. Theſe writers ſay, that the river in the heavens is not the Eridanus, but the Nile, and that this ſtar commemorates an iſland made by that river, which was called by the ſame name.

Canopus, in *Ancient Geography*, a town of Egypt, ſeated at the diſtance of 120 ſtadia from Alexandria, near the ſea, and at the extremity of the weſtern branch of the Nile, hence called "Oſtium Canopicum," or the Canopic branch. This branch commences near Faoüé or Fouch, croſſes the lake of Behiré or Bahira, and falls into the ſea near the ſcite of Canopus. Near its termination is the lake "Madie" or "Maadiè," denoting in Arabic "paſſage," which is the remains of this branch. This lake is, at preſent, only a ſalt-water lagoon, which has no communication with the Nile, except at the time of its greateſt increaſe. It is paſſed on horſeback, when the overflowing of the river, or a tempeſtuous ſea, has not augmented the depth of the water. In other caſes it is croſſed in a boat, but the paſs is very unſafe and incommodious. The mouth of this ancient branch of the Nile is very narrow, and formed by a bank of ſand. On the eaſtern bank ſtands a large ſquare building, reſembling in its conſtruction that of the French factory at Alexandria, and of all the Caravanſeries in Egypt. Beyond Maadiè towards the ſcite of Canopus, from which the ſea forms an immenſe bight, the ſea-ſhore is ſo low, that it became neceſſary to raiſe ditches or embankments of ſolid conſtruction and of conſiderable extent for keeping out the ſea, which covered a part of the adjacent ground as long ago as the time of Strabo, and which in bad weather ſtill overflows the dykes, extends as far as the promontory of the preſent Aboukir, and inundates a great ſpace of land. Upon theſe dykes ſmall towers are erected at ſome diſtance from each other. The town of Canopus, which is ſaid to have been built by the Lacedæmonians, and which is mentioned by ſeveral ancient writers, as Pliny, Tacitus, Seneca, and Juvenal, &c. was erected upon a rock, forming a handſome road for ſhipping, and elevated above the reach of inundations. Pliny, who collected the teſtimonies of antiquity relating to this place, ſays, that it was formerly an iſland; and the Periplus of Scylax points out a deſert iſland near the Canopic mouth: the local ſituation of Canopus renders this account credible. The remains of this ancient city occupy a vaſt extent of ground, which is ſtrewed with ruins that preſent many objects of admiration to the curious inquirer. The columns of beautiful granite that are found among theſe majeſtic ruins, called by the inhabitants of Aboukir, the city of Pharaoh, are of aſtoniſhing magnitude, and their capitals are of the fineſt workmanſhip; ſome of theſe columns were not long ago ſtanding, together with a large arch that formed the entrance to a ſubterraneous cavern; but they have recently been deſtroyed by the natives for the ſake of the ſtones, which they employed in their buildings and in repairing the dykes that confine the ſea. On the ſea-ſhore are ſtill obſervable, the foundations of a very large, regular building, in the midſt of which is a cavern leading to the ſea, where ruins are to be ſeen at a great diſtance. Blocks of granite of different forms lie ſcattered among theſe remains of antiquity, and in the midſt of theſe occaſionally covered by the ſea, which has made conſiderable encroachments, is a coloſſal ſtatue of a woman, made of granite, fluted through its whole length, and in ſome of its parts mutilated, which the people of the country conceive to have been the figure of Pharaoh's daughter. By the ſide of the ſtatue is a very large ſphinx, partly mutilated, the pedeſtal of which is encircled with hieroglyphics almoſt effaced. The columns of granite with which this place abounds, are probably parts of the magnificent temple, conſecrated to the honour and for the peculiar worſhip of Serapis. Foreigners from the moſt diſtant provinces, but particularly from Alexandria, reſorted hither in crowds, attracted rather by the pleaſures they might enjoy in the city, than for the purpoſe of offering ſacrifices to the god. The prieſts were, indeed, conſulted no leſs as phyſicians, than as interpreters of the oracle, and they were occupied in reciting the marvellous cures that were performed here, the honour of which they attributed to Serapis. We need not wonder that this ſhould be a place of great reſort, when we conſider that the ſurrounding country, inundated by the Nile, was clothed with the riches of nature, and that the city afforded all the enjoyments of luxury in the greateſt profuſion. The attractions of the ſituation, the beauty of the climate, the delicacies of the table, the general affluence of the people, and, in ſhort, the pleaſures of every kind, which ſeemed to have made this their favourite abode; all concurred to make Canopus the moſt enchanting retreat, and to render its inhabitants the happieſt aſſemblage of people.

"Pelæi gens fortunata Canopi,"

ſays Virgil, Georg. l. iv. But diſſipation had here attained its higheſt pitch; licentiouſneſs knew no bounds. Strabo (l. xvii. vol. ii. p. 1153.) informs us, that the canal which paſſed from Alexandria to Canopus was covered night and day with boats, full of men and women, who ſung and danced in the moſt laſcivious manner. To the ſame purpoſe Seneca obſerves, (Epiſt. 51.) that if a ſage wiſhed for retirement, he would not chooſe Canopus as a place of retreat. Juvenal, when he is repreſenting in ſtrong terms, the degree in which the manners of the Romans were corrupted, ſays, that Canopus itſelf condemned them:

"—— Et mores urbis damnante Canopo."

Upon or near the ruins of ancient Canopus, is built the preſent *Aboukir*, called by mariners, "Bekier," which has a caſtle built upon the point of a cape that projects a conſiderable way into the ſea. Some ſhoals ſtretching out beyond the cape encloſe, in a large bay which is here formed by the coaſt, a ſmall harbour, where veſſels lie in ſafety, at the foot of the caſtle, in the front of which is a good roadſtead; this was the uſual anchorage of French frigates, which cruiſed in theſe ſeas. It was alſo frequented by merchant-ſhips, when they were obliged, from bad weather, to quit the new and dangerous port of Alexandria; and likewiſe by the country "germs" when they could not make Alexandria, or clear the "Boghaſs" of the Nile at the mouth of the Roſſetta branch. In this roadſtead the valiant and now (1806), much lamented lord Nelſon obtained his glorious victory over the French fleet. See Aboukir.

Canopus, in *Pagan Mythology*, an Egyptian deity, as ſome have ſuppoſed, whoſe divinity probably originated in a Greek fable. The Greeks were fond of tracing the arts, ſciences, and theological opinions and rites of other nations to a Greek origin. Accordingly they relate, that Menelaus, in his return from Troy, ſtopped to refit his ſhips and refreſh his crew on the coaſt of Egypt, near one of the mouths of the Nile; and that, during his ſtay, Canopus or Canobus, his chief pilot, was bitten by a viper, and fell a victim to this accident. The city of Canopus, they ſay, was erected over his tomb, and derived its name from him. This etymology of Canopus is mentioned by Strabo, *ubi ſupra*. But though Herodotus ſays that Menelaus had been in Egypt, and has taken notice of the city called Canobus, he does not ſay a word of Canobus, or of his death. This Greek fable, however, was repeated in the fourth century by Epiphanius, (Oper. t. ii. p. 10. edit. Petavii.) who has made Canopus a particular deity of the Egyptians. Rufinus alſo has repeated it. (Hiſt. Eccleſ. ii. c. 26.) The Chaldeans, it has been ſaid, who worſhipped fire, carried their fancied deity through many countries, in order to evince his power to be ſuperior to that of other deities; and as he obtained a complete victory over all the other gods of wood, braſs, ſilver, and gold, his dominion was eſtabliſhed, or his claim to worſhip acknowledged. The prieſts of Canopus, when they heard of this triumph, determined to give their deity an opportunity of contending with that of the Chaldeans. They repreſented Canopus under the form of veſſels pierced with a great number of holes, which were ſtopped with wax, in which they were accuſtomed to purify the water of the Nile; and having filled one of theſe veſſels with water, and painted it with different colours, they fitted to its ſurface the head of an idol of human ſhape, and then brought it out to contend with the Chaldæan deity. The Chaldæans accordingly kindled a fire all round it; but when the heat had melted the wax, the water guſhed out through the holes, and extinguiſhed the fire; and thus, it is ſaid, Canopus conquered the god of the Chaldæans. As a proof that ſuch an Egyptian deity as Canopus actually exiſted, it has been alleged, that the geographer, Dionyſius Periegetes, calls the city of Canopus, the celebrated temple of Canobus of Amyclea:

"Καὶ τέμενος περίπυστον Ἀμυκλαίοιο Κανώβου."
"There ſtands Canobus temple known to fame:
"The pilot, who from fair Amycla came."

This paſſage, however juſtly interpreted, affords no evidence that a particular god, called Canobus, had a temple in that city. Homer (Il. B. v. 695.) calls the territory of Pyrrhaſus "the temple of Ceres," becauſe its fields were very fertile in corn. Thus alſo Pindar (Pyth. Od. iv.) calls Lybia and the whole of Egypt, "the fertile temple of the Nile." By a ſimilar metamorphoſis, Dionyſius might have called the city of Canopus, which he believed to have derived its name from the Mauſoleum of Canobus, "the temple of the pilot of Amyclea". The temple of Canopus was that of Serapis; and this deity was worſhipped in other countries beſides Egypt, under the appellation or diſtinction of Serapis of Canopus. The ſingular form under which Serapis was worſhipped at Canopus will ſerve to lead us into an acquaintance with the nature and attributes of this deity, which were different from thoſe of the Serapis or Pluton, brought by the Greeks to Alexandria. This was a bottle, or veſſel, as we have above mentioned, made of a very precious clay, which ſerved to filter the water of the Nile, or to render it clear and fit for drinking. The inhabitants of Canopus found this clay in their neighbourhood, and they carried on through Egypt an extenſive commerce in theſe filtrating veſſels. The medals of Canopus, ſtruck in honour of Adrian, preſent one of theſe vaſes ſurmounted with a ſerpent, which was, without doubt, the good genius, αγαθος Δαιμων. This name of good genius had been given to the branch of the Nile which flowed near Canopus. Hence we may conclude, that the great divinity of the

Canopians was the good genius of the Nile, and that it was repreſented by a filtrating veſſel; but this god of the Nile, which purſued its courſe in the Canopic branch, was transformed by the Greeks into Serapis. Accordingly they worſhipped at Alexandria Serapis-Pluton, and at Canopus, Serapis of the Nile. Many Egyptian vaſes, called "Canopes," are preſerved in the collections of Antiques; ſome of which may reaſonably be ſuppoſed to repreſent the Serapis of the Nile.

CANOPY, in *Architecture* and *Sculpture*, a magnificent kind of decoration, ſerving to cover, and crown an altar, throne, tribunal, pulpit, chair, or the like. See BALDACHIN.

The word is formed from the barbarous Latin *canopeum*, of κωνωπεῖον, *a net ſpread over a bed to keep off the gnats*, from κώνωψ, *a gnat.*

Canopies are alſo borne over the head in proceſſions of ſtate, after the manner of umbrellas.

The canopy of an altar is more peculiarly called CIBORIUM.

The Roman grandees had their canopies, or ſpread veils, called *thenſæ*, over their chairs: the like were alſo in temples over the ſtatues of the gods. The modern cardinals ſtill retain the uſe of canopies. The canopy, as we render κωνωπεῖον (Judith xiii. 9.) ſhould, as Dr. Shaw ſuggeſts (Travels, p. 221), rather be called the gnat, or muſquetoe net, which is a cloſe curtain of gauze or fine linen, uſed, all over the Eaſt, by people of better faſhion to keep out the flies.

CANORASAY, in *Geography*, a ſmall iſland of Scotland, near the eaſt-coaſt of the iſland of Coll.

CANOSA, a town of Italy, in the kingdom of Naples, and country of Bari, deſtroyed by an earthquake in 1694. It was once epiſcopal, but the ſee has been united to the archbiſhopric of Bari: 31 miles weſt of Bari. This town occupies part of the ſcite of the ancient Canuſium founded by Diomed, and afterwards a Roman colony, which became one of the moſt conſiderable cities in this part of Italy for extent, population, and magnificent buildings. The æra of Trajan ſeems to have been that of its greateſt ſplendour; but it was thus marked as an object alluring to the avarice and fury of the barbarians. Genſeric, Totila, and Autharis treated it with extreme cruelty. The province to which it belongs was reduced to a deplorable ſtate in 590. No town in Puglia ſuffered more than Canoſa from the outrages of the Saracens; and the meaſure of its diſtreſs was much augmented by the conteſts between the Greeks and Normans. In 1090, it was aſſigned, by agreement, to Bohemund, prince of Antioch, who died here in 1111. Under the reign of Ferdinand III. this eſtate belonged to the Grimaldis; but on their forfeiture, the Affaititi regained it, and ſtill retain the title of Marquis, though the Capeci are the proprietors of the fief. The ancient city ſtood in a plain between the hills and the river Ofanto, and covered a large tract of ground. Its ancient grandeur is ſtill atteſted by many fragments of aqueducts, tombs, amphitheatres, baths, military columns, and two triumphal arches, which ſeem to have been two city gates. The preſent town ſtands above, on the foundation of the old citadel, and is a poor remnant of ſo great a city, not containing above 300 houſes. The church of Sabinus, built, as it is ſaid, in the 6th century, has altars and pavements that are rich in marbles, and the ſix Verde Antico columns that ſupport its roof are the largeſt and fineſt, ſays Swinburne, which he ever ſaw of that ſpecies of marble. In a ſmall adjoining court, under an octagonal cupola, is the mauſoleum of Bohemund, adorned in a minute Gothic ſtyle. In 1461, the prince of Taranto, among other acts of barbarity practiſed by him at Canoſa, broke open this ſepulchre, and diſturbed the aſhes of a hero, who, by his extraordinary military talents, rivalled the fame of his father Guiſcard, and by his victories ſhook the throne of the eaſtern emperors; and when he was deprived of his Italian inheritance, turned his arms againſt the Saracens, and formed a new ſovereignty for himſelf in Paleſtine. As prince of Antioch, he became one of the firmeſt ramparts of the Cruſado againſt the infidels. Swinburne's Travels, vol. ii. p. 321.

CANOSA, in *Ichthyology*, a name given by Salvian, and ſome other authors to the ſpecies of SHARK, called by modern writers *ſqualus galeus*, the tope of the Corniſh fiſhermen.

CANOSIA, in *Geography*, a town of Piedmont, in the marquiſate of Saluzzo; 15 miles S.W. of Saluzzo.

CANOT *Cape*, lies on the eaſt ſide of the iſland of St. Lucia, in the Weſt Indies, towards the north end of the iſland. On its ſouth ſide is a bay of the ſame name.

CANOUGE. See CANOGE.

CANOVIO, a town of European Turkey, in the province of Albania; 22 miles S. of Durazzo.

CANOUL, a town of Hindooſtan, and capital of a circar, in the country of Hydrabad; 95 miles S S.W. of Hydrabad, and 124 E. of Biſnagur. N. lat. 16° 10′. E. long. 78° 7′.

CANOURGUE, LA, a town of France, in the department of the Lozere, and chief place of a canton, in the diſtrict of Marvejols. The town contains 2419, and the canton 6430 inhabitants; the territory includes 238 kiliometres and 7 communes. It is a place of conſiderable trade in cattle and woollen ſtuffs.

CANQUES, in *Commerce*, a ſort of cotton cloth made in China; with this cloth they make that firſt garment next their ſkin, which is properly their ſhirt.

CANRENA, in *Conchology*, a ſpecies of NERITA, that inhabits the Indian, African, and American ſeas, and of which there are nearly thirty varieties at preſent aſcertained. It is ſpecifically diſtinguiſhed by the ſhell, ſmooth, with a ſomewhat pointed ſpire, and bifid, gibbous, umbilicus, Linn.—*Obſ.* There is much reaſon to believe that ſome at leaſt of thoſe ſhells which Gmelin conſiders as varieties only of his *nerita canrena*, may prove, on further examination, to be diſtinct ſpecies.

CANSADO *Cape*, in *Geography*, is ſituated three leagues N.N.E. from Cape Blanco, on the coaſt of Africa.

CANSCHI, in *Botany*, (Rheed. Mal. i. tab. 42. Burm. Ind. 298.) See TREVIA *Nudiflora.*

CANSCHY, a large tree in Japan, from which the inhabitants make their paper. See a particular account of the proceſs from the Ephem. N. C. in the Coll. Acad. P. Etr. tom. iv. p. 144. It is not certainly known whether it be the paper mulberry, *morus papyrifera*, Linn. *papyrius*, Lam. *browſonnetia*, L'Herit. and Ventenat.

CANSJERA. Juſſ. 448. (Tſierou Cansjeram. Rheed. vii. tab. 2. Claſs and order, *pentandria monogynia.* Nat. Ord. *Thymeleæ*, Juſſ.

Gen. Char. *Calyx* globular-pitcher-ſhaped, four-toothed. *Corolla* none. *Stam.* filaments four, inſerted into the bottom of the calyx; anthers roundiſh, not extending beyond the calyx. *Piſt.* germ ſuperior, very ſmall, encloſed by four ſcales; ſtyle one; ſtigma capitate. *Peric.* berry one-ſeeded. A ſhrub. *Leaves* alternate. *Flowers* with one bracte, in axillary ſpikes. Character formed from a dried ſpecimen of Sonnerat's communicated by La Marck, except the fruit, which is taken from Rheede's figure.

CANSO, CANCEU, or CANCO, in *Geography*, an iſland, cape, and ſmall fiſhing-bank on the S.E. coaſt of Nova Scotia, about 40 leagues E. by N. from Halifax. The iſland is ſmall, and near the continent, N.E. from Cape Canſo, which is the ſouth-eaſternmoſt land of Nova Scotia. Canſo has a good harbour, about three leagues deep. Here are two bays of ſafe anchorage. Near theſe, on the continent, is a river, called Salmon river, on account of the great quantity of ſalmon taken and cured there. This is thought to be the beſt fiſhery of that ſort in the world. Limeſtone and gypſum are found in the gut of Canſo, which is a very narrow ſtrait, forming the paſſage from the Atlantic into the gulf of St. Lawrence, between Cape Breton and Nova Scotia.

Canso *Port*, of which the ſouth point is Cape Canſo, is ſituated in N. lat. 45° 20′ 7″. W. long. 60° 55′.

Canso is alſo a townſhip near the above-named place, in the county of Halifax.

CANSTADT, a town of Germany, in the circle of Swabia, and duchy of Wirtemberg, ſeated on the eaſt bank of the Neckar. In the town is a manufacture of printed linens, and near it are medicinal ſprings. It is diſtant three miles N.E. from Stuttgart. N. lat. 48° 51′. E. long. 7° 9′.

CANSTEIN, a town and citadel of Germany, in the circle of the Lower Rhine, and duchy of Weſtphalia; 6 miles S.E. of Stadtburg.

CANSTRISIUS, an officer in the church of Conſtantinople, whoſe buſineſs is to take care of the patriarch's pontifical veſtments, aſſiſt in robing him, and during maſs to hold the incenſe-pot, and ſprinkle holy water among the people, while the hymn of the Trinity is ſinging. The word is alſo written *Canſtrinſius*; it is uſually derived from *caniſtrum*, a name which ſome ſuppoſe given to the incenſe-pot, others to the kind of baſket in which the patriarch's veſtments were kept. Du-Cange.

CANSWA, in *Geography*, a river of Hindooſtan, which runs into the ſea, 40 miles S.S.W. of Junagur or Chunagur, in the country of Guzerat.

CANT, a quaint, affected manner of ſpeaking, or writing, adapted chiefly to the lower ſort.

Cant is originally derived from *Andrew Cant*, a Cameronian preacher in Scotland, who, by exerciſe, had obtained the faculty of talking in the pulpit in ſuch a tone and dialect as was underſtood by none but his own congregation; and hence the term is extended to denote all ſudden exclamations, and whining tones, eſpecially in praying and preaching. This origin of the word, however, has been diſputed, and it has been derived from the Latin *cantare*, to ſing. Others imagine that it is corrupted from *quaint*, of Fr. *coint*, and Lat. *comptus*.

Cant, or *Canting Language*, is alſo applied to words and phraſes affected by particular perſons, or profeſſions, for low ends, and not authorized by the eſtabliſhed language. Cant is not reſtrained to the ſtyle of gypſies, thieves, and beggars, but poſſeſſes a large department in the politer provinces of the Engliſh language. An anonymous author has given a *canting* dictionary, comprehending all the terms uſed in the ſeveral tribes of gypſies, beggars, ſhoplifters, highwaymen, foot-pads, and other clans of cheats and villains, with a collection of ſongs in the *canting* dialect. Lond. 1725, 8vo. A writer in the Tatler, aſſigns divers ſources of cant-words; as *phizz*, *hippo*, *mobb*, *pozz*, *bamm*, *&c.* Tatl. N° 230.

The ſea-language will moſt of it come under the denomination of cant; and the like holds of the terms in alchemy, heraldry, not to ſay in aſtrology, or even chemiſtry, pharmacy, &c. In reality the difference between a cant-term, and a technical term it is not eaſy to aſſign, unleſs we chooſe to reſtrain the former to words introduced out of folly, affectation, or impoſture; and the latter to ſuch as are introduced for the ſake of clearneſs, preciſion, and ſignificancy.

Cant is alſo uſed to denote a ſale by auction.

The origin of the word, in this ſenſe, is dubious; it may come, according to ſome, from *quantum*, how much; according to others, from *cantare*, to ſing, or cry aloud; agreeably to which, we ſometimes alſo call it an *out-cry*.

Cant-*timbers*, in *Ship-Building*, are thoſe timbers which are ſtationed near the two ends of a ſhip. They are ſo called becauſe their planes are inclined to the middle vertical ſection of the ſhip lengthwiſe, or plane of elevation, in contradiſtinction to thoſe whoſe planes are perpendicular thereto. And this *canting*, or *inclination* of any timber is ſuch, that it may ſtand perpendicular, or nearly ſo, to that part of the ſhip's ſide where the timber is ſtationed.

Cant is alſo popularly uſed for an angle, or corner: and cant-pieces are thoſe that are uſed in the angles of the fiſhes, and ſide-trees; or to ſupply any part that may be ſappy or rotten.

Cant, Arent, in *Biography*, aſſiſted Ruyſch, towards the end of his life, in making his anatomical preparations. He was afterwards a pupil to Albinus, and diſtinguiſhed for his abilities, but died at a very early age. He left a well-furniſhed library, abounding particularly in works on anatomy. In 1721, he publiſhed "Impetus primi anatomicè ex luſtratis cadaveribus nati," fol. Leid. with ſix engraved plates repreſenting the muſcles of the face, the carotid artery, dura mater, the heart in ſitu, the ſtomach, and joint of the knee, in general correctly delineated. Haller Bib. Anat.

CANTA, in *Geography*, a juriſdiction of South America, in the vice-royalty of Peru, and circuit of Lima. It begins at the diſtance of 5 leagues N.N.E. from Lima, where it terminates in the circado or circuit of that city. Its extent is above 30 leagues, moſt of which comprehend the firſt branch of the Cordillera of the Andes, ſo that the temperature varies in different parts of the country, and is thus beneficial to the fruits of the earth and paſtures; and as every ſpecies may be appropriated to its ſuitable degree of heat, the produce is large and very good. The papa is particularly diſtinguiſhed among the fruits, and the roots find a good market at Lima. The extenſive fields of Bombon, which partly belong to this juriſdiction, though cold from their high ſituation, afford paſture for innumerable flocks of ſheep: they are divided into "Haciendas," or eſtates belonging to noble families of Lima.

CANTABILE, an Ital. *adj.* implying *muſic* fit to be ſung; a melody for the voice, not inſtrumental. A ſeries of meaſured ſounds, of which the *cantilena* is graceful or pathetic, is ſaid to *ſing*. To be able to play or ſing an *aria di cantabile*, is the higheſt praiſe that can be beſtowed on a muſician. Execution ſurpriſes, and for a certain time amuſes; but goes no farther than the ear; but to ſing a cantabile with tenderneſs and expreſſion, is conveying ſounds to the heart.

CANTABRA, in *Ancient Geography*, a river of India, reckoned by Pliny among the moſt conſiderable which diſcharged themſelves into the Indus.

CANTABRI, a people of Hiſpania Citerior, or Hither Spain, or Provincia Tarraconenſis; whoſe diſtrict was bounded on the north by the ſea of their name, "Oceanus Cantabricus," now called the bay of Biſcay; and extended from the country of the Aſturii, on the weſt, to that of the Vaſconi, on the eaſt. Pliny divides them into four nations, without diſtinctly naming them. The Cantabrians inhabited a mountainous country, and were, in their diſpoſition and habits, ferocious and warlike. The women were no leſs valiant than the men; and devoted themſelves to ſimilar employments. Strabo mentions ſeveral facts, evincing the facility with which the females delivered themſelves of their children, without requiring any temporary confinement, or any intermiſſion of their uſual occupations. He alſo informs us, that they endured the ſevereſt tortures without betraying any concern, and chanted their ſongs even at the moment of their dying. It was with great difficulty that the Romans ſubdued this hardy and valiant people. They, as well as the Aſturians (ſee Asturia), defended themſelves for a conſiderable time with invincible firmneſs and reſolution; availing themſelves of the places of ſecure and inacceſſible retreat which their mountains afforded them. They were, however, at length overpowered, and conſtrained to ſubmit to the arms of Auguſtus, about 25 years before Chriſt. Antiſtius, Furnius, and Agrippa were employed in this ſervice; and after having been driven from their towns, and purſued even to their rugged mountains, whilſt the Roman fleet haraſſed their coaſts, they were obliged to ſhelter in mount Medullius, and were ſo ſurrounded, that they had no poſſible means of making their eſcape. When this ſtubborn people found themſelves thus encompaſſed, they preferred a voluntary death to ſurrender and captivity. Moſt of them deſtroyed themſelves by the ſword, by fire, or by a poiſon extracted from the yew-tree, or from an herb reſembling parſley, which they preſerved as a reſource againſt any reverſe of fate, becauſe it made them die without pain. Mothers ſmothered their children, to prevent their falling into the hands of the enemy; and among thoſe who were taken, a young boy was obſerved, who, having found a ſword, killed his brothers, and all his relations, by the order of his father. In like manner, a woman killed all that were priſoners with her. At laſt, when Auguſtus had ſucceeded in ſubduing them, he determined to ſoften their ferocity, by compelling them to abandon their mountains; having ſold ſome of the priſoners, he required hoſtages from thoſe that remained in the country, and fixed their abode in the plains. Impatient of a foreign yoke, they took advantage of the abſence of Auguſtus; they again revolted, and attacked the Roman garriſons with their uſual fury. Agrippa was therefore deputed to complete their reduction, but he found the enterpriſe extremely difficult, ſo that even the Roman ſoldiers under his command began to deſpair of ever accompliſhing it. This brave commander, ſo much were his legionaries diſheartened by the reſiſtance and repulſes with which they had to encounter, was under a neceſſity of recurring to intreaties and menaces, and of puniſhing ſome of his ſoldiers with ignominy, before he could induce them to renew their engagement with this formidable enemy. But having at laſt prevailed upon them to meet the Barbarians in an open field, he ſo animated them by his example, that, after an obſtinate conflict, he obtained a complete victory, and thus terminated this deſtructive war. Having put to death thoſe who were able to bear arms, and deſtroyed their caſtles and ſtrong holds, and forced thoſe who ſurvived to quit their mountains, and to ſettle in the plain, he ſubdued them ſo effectually, that they never attempted to revolt again, but quietly ſubmitted to the Roman yoke. Strabo, lib. iii. Sueton. in Auguſt.

The celebrity of the valorous Cantabrians was formerly ſo great, that moſt of the provinces of Spain laid claim to the honour of having been comprehended within the limits of ancient Cantabria. Louis XV. created or formed a regiment of this name, the 15th December 1745, which, by an ordonnance of the 1ſt of July 1747, was called Royal *Cantabre*. Silius Italicus, in his enumeration of the different tribes, people, or nations, whom Hannibal carried with him into Italy, makes the Cantabrians march before all the reſt. And Pompey regarded the Cantabrians, and ſome cohorts of the neighbouring people, as the beſt troops in his army.

Cantabria, the name of a country on the northen coaſt of Spain, called by the inhabitants Viſcara, and by others Biſcay, and comprehending the provinces of Biſcay, Alava, and Guipuſcoa. See the preceding article. Strabo ſays, (lib. iii. vol. i. p. 237.) that, according to the report of ſome writers, the Lacedæmonians had once poſſeſſed part of this country, and built in it a city called "Opſicella." The Goths having invaded Spain, in the 5th century, Leuvigeld reſolved to ſubdue that part of it which remained ſteadily attached to the Romans, and turning his arms againſt the Cantabrians, took and deſtroyed the city of Cantabria, ſituate between Logronno and Viana, and the city of Amaya. But there he terminated his career; afraid to run the riſk of penetrating farther among the mountains and defiles inhabited by thoſe people, who, in ſpite of him, continued faithful to the Romans, though they were entirely expelled from Spain.

CANTABRIAN, the ancient language of the north-eaſtern part of Spain, in uſe before the country was ſubdued by the Romans. Dr. Wallis ſeems to make the Cantabrian the ancient language of all Spain: which, according to him, like the Gauliſh, gave way to a kind of broken Latin called *romance*, or *romanſhe*; which by degrees was refined into the Caſtilian or preſent Spaniſh. But we can hardly ſuppoſe, that ſo large a country, inhabited by ſuch a variety of people, ſpoke all the ſame language. The ancient Cantabrian, in effect, is ſtill found to ſubſiſt in the more barren and mountainous parts of the province of Biſcay, Aſturias, and Navarre, as far as Bayonne, as much as the Britiſh does in Wales; but the people only talk it: for writing, they uſe either the Spaniſh or French, as they happen to live under the one or the other nation. Some attribute this to a jealouſy of foreigners learning the myſteries of their language; others to a poverty of words and expreſſions. The Cantabrian does not appear to have any affinity with any other known language, abating that ſome Spaniſh words have been adopted in it for things whoſe uſe the Biſcayans were anciently unacquainted with. Its pronunciation is not diſagreeable.

The Lord's prayer, in the Cantabrian tongue, runs thus: *Gure aita cervetan aicena, ſanctifica bedi hire icena, ethor bedi hire reſuma, eguin bedi hire vorondatea cervan becala lurrean ere*, &c.

CANTABRICA, in *Botany* (Cluſ. Hiſt. 2. 49.). See Convolvulus *cantabrica*.

CANTABRUM, in *Antiquity*. Under the Roman emperors, ſucceeding Conſtantine, this was a kind of banner, enſign, or ſtandard, differing in this reſpect from the vexillum, that the latter of theſe was a large flag, diſtinguiſhed by its colour, and by a device on it; whereas the former, or cantabrum, was only a ſmall ſtandard and flag, which had alſo a particular colour, and ſerved for rallying and encouraging the ſoldiers. For this purpoſe it is ſaid to have borne on it ſome words or motto of good omen. Minucius Felix and Tertullian mention it in their apologies, and compare it to a croſs.

CANTACUZENUS, Johannes, in *Biography*, emperor of Conſtantinople and a learned hiſtorian, was born of an ancient and noble family at Conſtantinople, about the year 1295; and having been bred both to literature and to arms, he attained the higheſt offices of the ſtate, ſuch as prefect of the bedchamber under Andronicus the Elder, and the dignity of domeſtic under Andronicus the Younger. Attaching himſelf to the intereſt of Andronicus the Younger, in oppoſition to that of his grandfather Andronicus the Elder, who abdicated the government A.D. 1328, and having contributed to reſcue him from the power of his grandfather, he brought him back in triumph to the palace of Conſtantinople, after ſix years of civil war. Under his reign Cantacuzene ruled both the emperor and the empire; and it was by his valour and conduct that the iſle of Leſbos and the principality of Ætolia were reſtored to their ancient allegiance. Although he enjoyed many favourable opportunities for enriching himſelf by oppreſſion and rapine, his enemies confeſs that, among the public robbers of the empire, Cantacuzene alone was moderate and abſtemious. Nevertheleſs, his wealth, probably devolved upon him by inheritance, appears from his own account of it to have been prodigious; more eſpecially when we conſider that it was partly accumulated in the laſt period of the empire, and in a land, moſt probably in Thrace, ſo repeatedly waſted by foreign and domeſtic hoſtility. He does not indeed ſpecify the value of his money, plate, and jewels; yet, after ſeveral very conſiderable deductions, his forfeit treaſures were ſufficient for the equipment of a fleet of 70 gallies. He does not give us either the extent or number of his eſtates; but his granaries were filled with an incredible ſtore of wheat and barley; and the labour of a thouſand yoke of oxen might cultivate, according to the practice of antiquity, about 62,500 acres of arable land. His paſtures were ſtocked with 2500 brood mares, 200 camels, 300 mules, 500 aſſes, 5000 horned cattle, 50,000 hogs, and 70,000 ſheep. Thus diſtinguiſhed by rural opulence, he enjoyed, in a very high degree, the favour of his ſovereign; and though he declined accepting the honour that was offered him of being his aſſociate in the ſovereignty, he was named in the laſt teſtament of Andronicus the Younger the guardian of his ſon John Palæologus, who ſucceeded his father in the ninth year of his age, A.D. 1341, and the regent of the empire during his minority. This truſt he diſcharged with fidelity, till a regard to his own ſafety rendered it neceſſary for him to adopt meaſures of ſelf-defence. A combination, however, was formed againſt his regency by the dowager empreſs, Anne of Savoy, the great duke or admiral Apocaucus, and John of Apri, patriarch of Conſtantinople. By this powerful confederacy Cantacuzene was aſſaulted at firſt with clandeſtine, and at length with open, arms. During his abſence on the public ſervice he was accuſed of treaſon; proſcribed as an enemy of the church and ſtate; and delivered, with all his adherents, to the ſword of juſtice, the vengeance of the people, and the power of the devil. His fortunes were confiſcated, his aged mother was caſt into priſon, all his paſt ſervices were buried in oblivion, and he was driven by injuſtice to perpetrate the crime of which he was accuſed. As long as the empreſs and the patriarch affected the appearances of harmony, he repeatedly ſolicited the permiſſion of retiring to a private, and even a monaſtic, life; and after he had been declared a public enemy, it was his fervent wiſh to throw himſelf at the feet of the young emperor, and to receive without a murmur the ſtroke of the executioner. At length he reluctantly adopted the only meaſure that was likely to avail to his ſecurity, which was that of drawing the ſword and aſſuming the imperial title. Accordingly in the ſtrong city of Demotica, his peculiar domain, he aſſumed the purple, A.D. 1341; maintaining, even in this act of revolt, ſome ſhew of loyalty, by cauſing to be proclaimed the titles of John Palæologus and Anne of Savoy before his own name and that of his wife Irene. Conſtantinople adhered to the young emperor, and the principal cities of Thrace and Macedonia renounced their obedience to Cantacuzene. His army, which was ſtationed in ſix diviſions on the banks of the Melas, for the purpoſe of tempting or intimidating the capital, was diſperſed by treachery or fear; and the officers accepted the bribes, and embraced the ſervice, of the Byzantine court. Cantacuzene, driven by Apocaucus from the coaſt into the mountains of Servja, his truſty band of followers was diminiſhed to 2000, and at laſt to 500, volunteers. The "Cral," or deſpot of the Servians, received him with hoſpitality; but in a ſtate of miſerable dependence, he in vain ſolicited aſſiſtance, and was at length diſmiſſed, without injury, to a new viciſſitude of hopes and perils. A civil war commenced, which, after having raged for nearly ſix years, terminated in a deciſive victory on the part of Cantacuzene, who re-entered Conſtantinople A.D. 1347. The inflexible Anne, deſtitute of the powers of reſiſtance, or the hope of relief, was at length compelled to yield to the ſupplications of her friends and enemies; and a treaty was dictated by the conqueror, who profeſſed a loyal and zealous attachment to the ſon of his benefactor. The marriage of his daughter Helen with John Palæologus, to whom ſhe had been for ſome time engaged, was at length conſummated; the hereditary right of the pupil was acknowledged; but the ſole adminiſtration, during ten years, was veſted in the guardian. Thus two emperors and three empreſſes were ſeated on the throne; a general amneſty was proclaimed; and the feſtival of the coronation and nuptials was celebrated with fallacious appearances both of concord and magnificence. The tranquillity of Cantacuzene and of the empire was, however, ſoon diſturbed by ſuſpicions and enmities between the two emperors and their reſpective adherents, which at length broke out in a civil war, A.D. 1353. Cantacuzene, aided by the Turks, was ſucceſsful, and the young emperor was compelled to take ſhelter among the Latins of the iſle of Tenedos. The victor, provoked by his inſolence and obſtinacy, was induced to aſſociate with himſelf his ſon Matthew, whom he inveſted with the purple, and thus he eſtabliſhed the ſucceſſion in the family of the Cantacuzeni. Palæologus, however, aſſiſted by the Genoeſe, who, by a treaty ſubſcribed by Cantacuzene, A.D. 1352, which for ever baniſhed the Venetians and Catalans, obtained a monopoly of trade, and almoſt a right of dominion, regained Conſtantinople, A.D. 1355; and Cantacuzene abdicated his ſhare of the government, and retired to a monaſtery, where, under the aſſumed name of Joaſaph and the habit of a monk, he devoted the reſidue of his life to literary and theological exerciſes. His wife Irene alſo retired to a nunnery, and exchanged her own name for that of Eugenia. If, indeed, he iſſued from this retreat, it was as the miniſter of peace, to ſubdue the obſtinacy and ſolicit the pardon of his rebellious ſon. In the retirement of a cloyſter his active ſpirit prompted him to engage in a controverſy againſt the Jews and the Mahometans, and he compoſed four apologies for the Chriſtian religion and four diſcourſes or books, (printed in Greek and Latin at Baſil, in 1543, by Bibliander and Gualtherus, from Greek MSS.) at the particular requeſt of a proſelyte to Chriſtianity, Achæmenides, called alſo Meletius, who was aſſaulted with letters from his friends at Iſpahan. Maracci informs us, that, though he had read the Koran, he adopts the vulgar prejudices and fables againſt Mahomet and his religion. He alſo, with equal zeal, defended the divine light of mount Thabor; and under the character of emperor and theologian, he preſided in the ſynod of the Greek church, which eſtabliſhed, as an article of faith, this uncreated light. See the article Barlaam. In his retirement he alſo wrote a hiſtory of his own times in four books, or at leaſt of thoſe times during which he was a principal actor, comprehending a period that extends from the revolt of the younger Andronicus, A. D. 1320, to his own abdication of the empire, A.D. 1355, and continued one year beyond the abdication of his ſon Matthew, A. D. 1357. "In this eloquent work," ſays Gibbon, "we ſhould vainly ſeek the ſincerity of an hero or a penitent. Retired in a cloyſter from the vices and paſſions of the world, he preſents not a confeſſion, but an apology, of the life of an ambitious ſtateſman. Inſtead of unfolding the true counſels and characters of men, he diſplays the ſmooth and ſpecious ſurface of events, highly varniſhed with his own praiſes and thoſe of his friends. Their motives are always pure; their ends always legitimate; they conſpire and rebel without any views of intereſt; and the violence which they inflict or ſuffer is celebrated as the ſpontaneous effect of reaſon and virtue." Voſſius, however, without heſitation, prefers him to all the Byzantine hiſtorians. A Latin tranſlation of this hiſtory, from the Greek MS. in the library of the duke of Bavaria, with notes, was publiſhed by Pontanus at Ingolſtadt in 1603, fol.; and at Paris in 1645, in a ſplendid edition conſiſting of 3 volumes, fol. of the Greek from the MS. of M. Seguier, chancellor of France, with Pontanus's Latin verſions, and the notes both of Pontanus and Gretſer. Some other treatiſes by Cantacuzene, who aſſumed the name of Chriſtodulus the monk, are extant in MS. in the Vatican, Pariſian, Cæſarean, and Bodleian libraries. The death of Cantacuzene is placed by reſpectable authority on the 20th of November 1411. (Du-Cange, Fam. Byzant. p. 260.) But if he were of the age of his companion Andronicus the Younger, he muſt have lived 116 years; a rare inſtance of longevity, which, in ſo illuſtrious a perſon, would have attracted univerſal notice. Fabr. Bib. Græc. t. vi. l. v. c. 5. §. 12. p. 469, &c. Gibbon's Hiſtory, &c. vol. xi.

**CANTADUANES**, in *Geography*. See CATANDUANES.

**CANTÆ**, in *Ancient Geography*, a people of Britain in that part called Caledonia, who, according to Ptolemy, were ſeated towards the eaſtern coaſt on the north ſide of the frith of Tayne. Mr. Baxter places them in Buchan, which he derives from the Britiſh words "Pow Chant," ſignifying, as he ſays, the country of the Cantæ.

**CANTAL**, in *Geography*, a large and lofty mountain of France, which is ſaid to be 993 toiſes higher than the level of the ſea, and always covered with ſnow. It is ſituated in the centre of a department to which it gives name, and which is one of the three formed out of Auvergne and le Velay. This department is bounded on the north by the departments of Upper Loire, Puy de Dôme, and Corrèze; on the eaſt by thoſe of Upper Loire and Lozère; on the ſouth by thoſe of Lozère, Aveyron, and Lot; and on the weſt by thoſe of Lot and Corrèze. Its ſuperficies is about 1,124,802 acres, or 574,081 hectares; its population conſiſts of about 243,708 perſons; and it is divided into four communal diſtricts, viz. Mauriac, Murat, St. Flour, and Aurillac.

**CANTALIVER**, in *Architecture*. This term is uſed by workmen to denote thoſe blocks which are frequently placed, at regular diſtances, under the eaves of a houſe, or the upper mouldings of a cornice, which they ſerve to ſupport or ornament. Cantaliver, therefore, is eſſentially the ſame with modillion; but the latter word is confined to the deſcription of regular architecture, while the former has a general and trivial uſe.

**CANTANUS**, in *Ancient Geography*, a town placed by Steph. Byz. in the iſland of Crete. It was an epiſcopal ſee, and mentioned in the acts of the council of Chalcedon.

**CANTAR**, or CANTARO, in *Commerce*, an eaſtern weight, of different value in different places, equivalent at Acra in Turkey to 603 pounds, at Tunis and Tripoli to 114 pounds.

CANTAR is alſo an Egyptian weight, which is denominated a *quintal*, and conſiſts of a hundred, or of an hundred and fifty *rotolos*, according to the goods they are to weigh.

**CANTERA**, in *Geography*, a river of Sicily, anciently called "Taurominius," which runs into the ſea; five miles ſouth from Agoſta.

**CANTARE**, *Ital.* to ſing. Singing is a faculty that requires the union of ſo many gifts of *nature*, and ſo much aſſiſtance from *art*, that the complete concurrence and union of both rarely happen. The requiſites from nature are a voice full, flexible and extenſive in compaſs, well-toned, ſweet, clear, and intereſting; with an ear perfectly correct in time and tune. The acquiſitions from art are a good *portamento*, or delivery of the voice from the cheſt, free from naſal or guttural defects, a good ſhake, good taſte and expreſſion, with a rapid, diſtinct, neat, and articulate execution of diviſions, and the power of ſuſtaining a long note with ſteadineſs, and of augmenting and diminiſhing its force by the moſt minute degrees.

The individual in poſſeſſion of all theſe requiſites, will be regarded as a prodigy! and with health, diligence, and good conduct, may be pronounced heir to a great eſtate, ariſing from means the moſt flattering to ſelf-love, and grateful to a good heart: the power of innocently delighting mankind.

Theſe qualifications the critical and faſtidious hearer thinks his due—be it ſo: but in order to balance the account between the performer and his audience, let us remind the latter of the fair and juſt claims which every performer poſſeſſed of great talents has on the public, but in a particular manner, a ſinger, who having arrived at theſe captivating powers by unceaſing ſtudy, toil, and experience, is not only entitled to conſiderable remuneration, but to regard and attention from the public, for its own ſake: for if by neglect, noiſe, and mortification, a vocal performer's mind is diſquieted, and cheſt agitated, that ardent deſire to pleaſe thoſe who ſeem diſpoſed to be pleaſed, and thoſe efforts which encouragement alone can ſtimulate, are chilled and paralyzed, to the great loſs of the feeling part of an audience, and diſgrace of the humbled performer. From ſuch treatment what can be expected but a cold, inanimate, and lifeleſs, performance, without profeſſional zeal, or the enthuſiaſm of genius and talents.

Garrick uſed to ſay, that applauſe was an aliment without which he could not live on the ſtage; and inattention to the part he was repreſenting, he never forgave. He complained to an officer on guard, of a centinel yawning aloud on the ſtage during his acting one of his beſt parts; and he never reſted till Pinto the firſt violin, and leader of the band, had quitted his ſtation, after perceiving him fall aſleep in the orcheſtra, in ſight of the whole houſe, while he was acting one of the moſt impreſſive and afflicting ſcenes in King Lear.

Singing has long been cultivated and cheriſhed in Italy. In the *Cortegiano* of Caſtiglione, written at the beginning of the 15th century, we are told of two ſingers, whoſe merit in a totally different ſtyle of ſinging was ſo equal and ſo great, that they charmed all hearers. Theſe performers are mentioned to prove, that in all the arts there are various roads that lead to perfection, and different means of delighting mankind. *Bidon*, ſays the author of that pleaſing work, has ſuch force, readineſs, and variety of paſſages, that the ſouls of all hearers are ſo excited, inflamed, and raviſhed, that they ſeem tranſported above themſelves, and almoſt exalted into heaven. Nor does *Marchetto Cara* leſs excite the affections by a more tender and touching ſtyle, which commiſerates and ſoothes the afflictions of others, or with ſweet, complaining, heart-felt notes, ſoftens, inſtructs, and penetrates the mind, for ſorrows not their own. Toſi applies to Fauſtina and Cuzzoni, the two great vocal rivals of his time, theſe captivating powers by diſſimilar talents. And we may, perhaps, with equal accuracy and candour affirm, that ſuch are at preſent (1802) the excellencies of the *Billington* and the *Banti*, that whoever prefers the one to the other, only proves that the taſte of hearers is as various as the ſtyle of ſinging of great performers.

Since the eſtabliſhment of operas, no profeſſional talents in any of the fine arts have been more celebrated than thoſe of great Italian ſingers; who being invited to different ſtates and kingdoms, have an opportunity of extending their fame to every part of Europe; and their talents are as well known at Vienna, Madrid, Peterſburgh, Dreſden, Berlin, Munich, and London, as in their own country.

We cannot pretend to render this article a complete elementary treatiſe on ſinging, and, indeed, as Johnſon truly ſaid of books of inſtruction, "nothing is well made by a receipt:" yet, to trace, and ſpecify a few of the firſt principles of the art, may be of ſome uſe to vocal ſtudents out of the reach of better inſtructions.

For thoſe who ſeek vocal precepts in books, we recommend the peruſal of *Toſi* and *Mancini;* and as a ſynopſis of the art, we ſhall preſent our readers with *Tenducci*'s firſt injunctions to his ſcholars. For *ſolfeggj*, or exerciſes for the voice, thoſe of Leo, on which ſo many great ſingers have been formed, are now only uſeful to the performers of old muſic; but new melody requires new *ſolfeggj*, to prepare a ſinger for diviſions and graces of the preſent times. For ſuch, the moſt modern, and perhaps the beſt, are thoſe of Aprile, which, however, are now full 30 years old; but many new melodies have been ſince produced in the vocal compoſitions of Paeſiello, Cimaroſa, Sarti, Haydn, and Mozart, as well as refinements in the performance of Pacchieretti and Marcheſi, with which young ſingers ſhould be made acquainted.

The *Cyclopædia,* being intended to aſſiſt thoſe who ſtudy an art or ſcience without a maſter, we ſhall preſent the ſolitary ſtudent in ſinging with the following inſtructions drawn up in Italian, as we imagined by the late Signor Tenducci, who brought them to the author of the preſent article to reviſe and tranſlate; but on comparing them with the preliminary rules placed at the head of the Engliſh edition of Aprile's *Modern Italian Method of ſinging*, under the title of *Neceſſary Rules for Students and Dilettanti of* VOCAL MUSIC; it appears that the Italian copy of the Inſtructions, brought by Tenducci to be tranſlated, belonged to Aprile, and that the Engliſh tranſlation of theſe rules is literally that with which Tenducci was furniſhed by ourſelves.

*Tenducci's Inſtructions to his ſcholars.*

Neceſſary rules for ſtudents and dilettanti of vocal muſic.

I. The firſt and moſt neceſſary rule in ſinging, is to keep the voice ſteady.

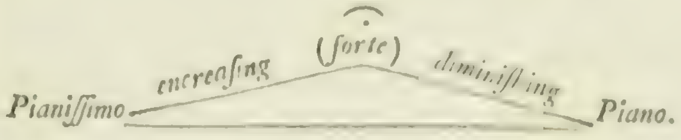
II. To form the voice in as pleaſing a tone, as is in the power of the ſcholar.

III. To be exactly in tune; as without a perfect intonation, it is needleſs to attempt ſinging.

IV. To vocalize correctly; that is, give as open and clear a ſound to the vowels, as the nature of the language, in which the ſtudent ſings, will allow.

V. To articulate perfectly each ſyllable.

VI. To ſing the ſcale, or gammut frequently; allowing to each ſound one *breve*, or two *ſemibreves*, which muſt be ſung in the ſame breath; and this muſt be done, in both, *a meſſa di voce:* that is, by ſwelling the voice, beginning *pianiſſimo*, and increaſing gradually to *forte*, in the firſt part of the time; and ſo diminiſhing gradually to the end of each note, which will be expreſſed in this way,



VII. To exerciſe the voice in *ſolfeggio* every day, with the monoſyllables, *do, re, mi,* &c.

VIII. To copy a little muſic every day, in order to accuſtom the eye to divide the time into all its proportions.

IX. Never to force the voice, in order to extend its compaſs in the *voce di petto*, upwards; but rather to cultivate the *voce di teſta*, in what is called *falſetto,* in order to join it well, and imperceptibly, to the *voce di petto*, for fear of incurring the diſagreeable habit of ſinging in the throat, or through the noſe;—unpardonable faults in a ſinger.

X. In the exerciſe of ſinging, never to diſcover any pain or difficulty, by diſtortion of the mouth, or grimace of any kind; which will be beſt avoided by examining the countenance in a looking-glaſs, during the moſt difficult paſſages.

XI. It is recommended to ſing a little at a time, and often, and if ſtanding, ſo much the better for the cheſt.

XII. That ſcholars ſhould appear at the harpſichord, and to their friends, with a calm and cheerful countenance.

XIII. To reſt or take breath between the paſſages, and in proper time; that is to ſay, to take it only when the periods, or members of the melody, are ended; which periods, or portions of the air, generally terminate on the accented parts of a bar. And this rule is the more neceſſary, as by dwelling too long upon the laſt note of a muſical period, the ſinger loſes the opportunity it affords of taking breath, without breaking the paſſages or even being perceived by the audience.

XIV. That, without the moſt urgent neceſſity, of either a long paſſage, or of an affecting expreſſion, the words muſt never be broken, or divided.

XV. That a good *meſſa di voce*, or ſwell of the voice, muſt always precede the *ad libitum* pauſe 𝄐 and *Cadenza.*

XVI. That in pronouncing the words, care muſt be taken to accord with the ſentiment that was intended by the poet.

XVII. That the acute and ſuper-acute ſounds muſt never be ſo forced as to render them ſimilar to ſhrieks.

XVIII. That in ſinging, the tones of the voice muſt be *united,* except in the caſe of ſtaccato notes.

XIX. That in pronouncing the words, double conſonants in the Italian language, muſt be particularly enforced, and care taken not to make thoſe that are ſingle ſeem double.

XX. To practiſe the *ſhake* with the *greateſt care and attention,* which muſt generally commence with the higheſt of the two notes, and finiſh with the loweſt.

XXI. That the ornaments and embelliſhments of ſongs ſhould be derived from the character of the air, and paſſion of the words.

As Aprile was the real author of theſe precepts, to whom we did not allow an article when we were at work upon the letter A, not knowing whether he was ſinging Alleluiahs in this world or the next, we ſhall endeavour here to make him and our muſical readers ſome amends for the omiſſion.

Theſe rules are ſhort, but clear and uſeful; to ſuch as have neither the advantage of a good maſter, nor are in poſſeſſion of Toſi's *Obſervations on florid Song*, in the original, or the excellent tranſlation by Gaillard, which is now become ſcarce; and, though the book was written early in the laſt century, moſt of the precepts it inculcates are ſtill good, and have not yet been ſuperſeded by thoſe of any better work on the ſubject in our own language. See Tenducci.

APRILE, Giuseppe, in *Biography*, a celebrated Italian opera ſinger, with a *ſoprano* voice, born in 1746. He performed, during 20 years, the principal man's part in moſt of the great theatres of Europe. In 1763 at Stuttgard; in Jomelli's Didone, at Milan; at Florence, ſerious men's part in burlettas by Anſoſſi, as *Il Geloſo in cimento*, &c. and at length he fixed at Naples, where we heard him ourſelves in 1770.

We found his voice ſweet and flexible, but not very powerful, or equal, in its whole ſcale. He had, however, a good ſhake, an elegant perſon, and much taſte and expreſſion.

Since that time, his favour, as well as taſte and ſcience, increaſed by ſtudy and experience. He had a reflecting and contemplative mind, was well acquainted with the *coſtume* of paſt and preſent times, as well as with the ſtyles of compoſition and taſte in ſinging. When he retired from the ſtage, he dipt into compoſition, and compoſed ſome of the moſt graceful and pleaſing *duetti di camera*, which perhaps ever appeared. During many years he was regarded as the beſt ſinging maſter in Europe. He compoſed and publiſhed new *ſolfeggj*, which were very much wanted, as thoſe of Leo, admirable in their day, were become almoſt vulgar and uſeleſs, by the change of ſtyle, both in compoſition and ſinging.

We were very much pleaſed with a remark which this enlightened muſician made to an Engliſh lady, one of his ſcholars, at Naples, concerning a perſon of low birth, and without education, being accidentally introduced into high life, and learning to ſing, with a powerful voice, a good perſon, and every requiſite neceſſary for a comic ſinger, a good mimic, and a great portion of natural humour. But her great ambition was to become, or at leaſt to be thought, a ſerious ſinger in the cantabile and *gran guſto* of Italy. But Aprile obſerved, that "it was impoſſible ſhe ſhould ever ſucceed in the ſerious and pathetic ſtyle, not only for want of a diſpoſition for ſerious things, but a mind accuſtomed to elegance, refinement, and cultivated feelings."

CANTARILLA, in *Geography*, a town of Spain, in the province of Murcia; 3 leagues from Murcia.

CANTARINI, Simon, in *Biography*, ſurnamed the "Pezareſe" from his having been born at Pezaro in 1602, was the diſciple and friend of Guido, and acquired diſtinguiſhed excellence as a painter, by imitating that great artiſt. The works of the ſcholar were often miſtaken for thoſe of the maſter. He died at Verona in 1648.

CANTARO, in *Commerce*, an Egyptian weight, which at Naples is equivalent to 25 pounds, at Genoa to 150 pounds. At Leghorn there are three kinds of cantaras, one weighing 150 pounds, another 151, and a third 160 pounds. The pound of Leghorn is 8 ounces.

Cantaro is alſo a Spaniſh liquid meaſure, in uſe eſpecially at Alicant, containing three gallons.

Cantaro is alſo a meaſure of capacity, uſed at Cochin, containing four rubies, the rubi 32 rotolos.

Cantaro, in *Geography*, a town of Naples, in the province of Principato Citra; 8 miles N. N. E. from Policaſtro.

CANTATA, the title of a ſhort lyric poem, conſiſting of alternate recitation and air. The word *Cantata*, according to Du Cange, was uſed in the church as early as the year 1314, to expreſs what we at preſent mean by *anthem*, with which it is ſtill ſynonymous in Germany; being chiefly confined in the Lutheran church to ſacred muſic. The Romiſh church had many admirable *ſacred cantatas* during the laſt century, by Cariſſimi, Graziani, Baſſani, and others. And during the preſent century, Domenico Scarlatti ſet one at Rome for Chriſtmas Eve, which was performed in the apoſtolic palace, 1717. Bononcini ſet another, 1729, for the ſame occaſion and place. The difference at preſent between *ſacred cantatas* and *motets* ſeems to be the recitative.

The ſecular *cantata* is a ſpecies of compoſition extremely well ſuited to the chamber, in which fewer parts, fewer great effects, and leſs light and ſhade, are neceſſary, than in eccleſiaſtic or dramatic Muſic; for the performance being in ſtill life, and the poet and muſician without an orcheſtra or choir to aſſiſt in painting the ſtronger paſſions, compoſers aimed, for a long time, at no effects out of the power of a ſingle voice and a ſingle inſtrument to produce.

Cantatas of conſiderable length, accompanied by a numerous band, are uſually performed in Italy on great occaſions of feſtivity: as the reconciliation of princes after long diſunion, or the arrival of great perſonages in the capital of a ſtate. Thus, when pope Ganganelli and the king of Portugal were reconciled, in 1770; and ſoon after, when the Emperor Joſeph arrived at Venice, on his firſt viſiting Italy, cantatas were ſung at Rome and Venice equal in length to an opera. But theſe differ eſſentially from what is uſually meant by a cantata or monologue for a ſingle voice, conſiſting of ſhort recitatives, and two or three airs at moſt; as they are occaſional poems in which ſeveral ſingers are employed; but though in dialogue, they are performed, like oratories, without change of ſcene, or action.

As *cantatas* were firſt ſuggeſted by the muſical recitation of the opera in which the chief events were related in recitative; in like manner they received ſeveral progreſſive changes during the 17th century, previous to their perfection. Firſt, they conſiſted, like opera ſcenes, of little more than recitative; with frequent formal cloſes, at which the ſinger, either accompanied by himſelf or another performer on a ſingle inſtrument, was left at liberty to ſhew his taſte and talents.

The next change was in having a ſingle air, generally in triple time, diſtinct from the recitative, and repeated to different ſtanzas after each narrative part of the poem, like modern ballad airs. At this time the term *da capo* not being in uſe, the air was written over again, as often as it was wanted, ſometimes in exactly the ſame notes, but more frequently, with little changes and embelliſhments to the ſame baſe, and to different ſtanzas.

Before the invention of recitative, madrigals for voices alone, and afterwards for inſtruments in uniſon with the ſeveral vocal parts, conſtituted the chief muſic that was performed in the chamber, and in private concerts, till ſolo ſongs, accompanied by a ſingle inſtrument, were brought into favour by Caccini and his imitators, in Italy and other parts of Europe. See Caccini.

Adami tells us, page 194, that Giovanni Domenico Poliaſchi Romano, admitted into the Pope's chapel 1612, compoſed ſeveral cantatas in a good ſtyle, and in the beſt taſte of ſinging, which were printed 1618; and page 195, that the Cavalier Loreti Vittorij da Spoleto, ſoprano in the pope's chapel 1622, and one of the firſt evirati employed in muſical dramas on the ſtage, was a celebrated compoſer of *Arie, e* Cantate *da Camera*.

The firſt time, however, that we have found the term Cantata, uſed for a ſhort narrative lyric poem, was in the *Muſiche varie a voce ſola del* Signor Benedetto Ferrari da Reggio, printed at Venice 1638; which is twenty years more early than the period at which the invention of cantatas is fixed by ſome writers, who have given the honour to Barbara Strozzi, a Venetian lady, who, in 1653, publiſhed vocal compoſitions, under the title of Cantate, *Ariette e Duetti.* Ferrari, *detto della tiorbo*, for his excellent performance on that inſtrument, was one of the earlieſt compoſers of operas for Venice. Of the two firſt muſical dramas that were performed in that city, 1637 and 1638, Ferrari was only the poet; but in 1639, he was author both of the words and muſic of the opera of Armida, as he was of ſeveral ſubſequent muſical dramas.

Cariſſimi, Ceſti, Luigi Roſſi, Stradella Legrenzi, Baſſani, Aleſſandro Scarlatti, Gaſparani, d'Aſtorga, Marcello, Bononcini, Porpora, and Handel, all cultivated cantatas, and added ſomething to the beauty of their conſtruction.

The golden age of *Cantatas*, in Italy, was the beginning of the laſt century, when they were brought to their greateſt degree of perfection, without other accompaniment than a baſe viol, and harpſichord, by the genius and abilities of Aleſ. Scarlatti, Franceſco Gaſparini, Giovanni Bononcini, Antonio Lotti, the Baron d'Aſtorga, and Benedetto Marcello; and, at a later period in a more elaborate ſtyle, with accompaniments, by Nicolo Porpora, and Giovanbattiſta Pergoleſi, who ſeem to have been the laſt eminent compoſers that cultivated this ſpecies of chamber drama, till it was revived by Sarti.

The moſt voluminous and moſt original compoſer of cantatas that has ever exiſted, in any country to which our enquiries have reached, ſeems to have been Aleſſandro Scarlatti. Indeed, this maſter's genius was truly creative; and we find part of his property among the ſtolen goods of all the beſt compoſers of the firſt forty or fifty years of the laſt century.

Pergoleſi's cantatas will be conſidered with his other works, elſewhere.

The French followed the Italian faſhion in their rage for *cantatas*. Their great lyric poet, Baptiſte Rouſſeau, and others, wrote a great number, which were ſet *à la Lulli*, and ſung *à la Françoise*; but having never been heard *out* of France, nor could the muſic now be found, we believe, *in* it, we ſhall be excuſed, it is hoped, if we refrain from diſturbing the aſhes of the dead. There is an excellent critique on *Cantatas*, particularly thoſe of his own countrymen, by M. Ginguené, in the new *Encyclopædie*, in which he has treated the ſubject with much judgment and good taſte.

In England, *cantatas* were publiſhed early in the laſt century, by Handel, Bononcini, Attilio Arioſti, Gaſparini, Roſeingrave, and Dr. Pepuſch; as difficult to find now, perhaps, as thoſe of Clerambaut, Monteclair, Campra, Mouret, and Batiſtin, in France.

But *Cantatas*, which were compoſed with more care, and ſung with more taſte and ſcience than any other ſpecies of vocal muſic, during the latter end of the 17th century and beginning of the laſt, ſeem to have been wholly laid aſide, after the deceaſe of Pergoleſi, till revived by Sarti, who has ſet, in the manner of cantatas, ſeveral of Metaſtaſio's charming little poems, which he calls *canzonette*. Theſe exquiſite compoſitions were produced by Sarti expreſsly for the voices of Pacchierotti, Marcheſi, and Rubinelli, and are, in all reſpects, the moſt perfect and complete models of *chamber muſic* that have ever come to our knowledge.

Indeed, it is to be lamented that a ſpecies of compoſition ſo admirably calculated for concerts as the *cantata*, ſhould now be ſo ſeldom cultivated: as it contains a little drama entire, having a beginning, a middle, and an end, in which the charms of poetry are united with thoſe of muſic, and the mind is amuſed while the ear is gratified. Opera ſcenes, or ſingle ſongs, now ſupply the place of cantatas in all private concerts; but, beſides the loſs which theſe ſuſtain when taken out of their niche, as they were originally calculated for a numerous orcheſtra, they can ſeldom be completely accompanied by a ſmall band.

Cantatilles, *French*, the diminutive of *Cantate*. It ſeems to be equivalent to *Canzonetta* in Italian, when a few lines of recitative precede a ſhort air.

CANTATRICES, in *Middle Age Writers*, hired weepers, and waiters at funerals.

CANTAYA, in *Geography*, a ſmall iſland of the Eaſt Indian Ocean, ſituate in a gulf formed by the weſt point of the iſland of Java.

CANTECROIX, a town of Brabant, in a ſmall territory of the ſame name; 5 miles S.E. from Antwerp.

CANTEEN, in French *Cantine*, is the cabaret, tavern, or place in a garriſon-town or city, where the garriſon or troops have the privilege of purchaſing ſpirits, wine, and beer at a much cheaper rate than they can buy them at other taverns or public houſes. For the moſt part every citadel, fort, fortreſs, and caſtle, has the *droit de cantine*.

Canteen for tobacco, in French *Cantine du Tabac*. By an ordinance of the 30th July, 1720, the king of France eſtabliſhed a ſufficient number of ſuch canteens for furniſhing his troops with the tobacco neceſſary for their conſumption.

Canteen-*maſter*, or *Canteen-keeper*, in French *Cantinier*, is the perſon who has charge of the canteen, diſpoſes of things in it, and makes the proper, neceſſary, and authorized diſtributions in it.

Canteen, a ſmall veſſel uſually made of tinned plate or wood, in which ſoldiers, when on their march, or in the field, carry their liquor. The uſe of wooden canteens has for ſome time been general in the Britiſh armies. They are made cylindrical, like barrels, 7½ inches diameter, and 4 inches long outſide, holding three pints. (See *Manufacture of* Canteens, *Plate* I. *fig.* 1.) Mr. George Smart, a very ingenious mechanic of Ordnance Wharf, Weſtminſter-bridge, who manufactures theſe in great numbers for government, having adopted and contrived a very complete ſet of machines for abridging of labour therein, has liberally permitted us to deſcribe and make drawings of this manufacture, which will, we truſt, be acceptable to our readers. The wood which Mr. Smart uſes, is the beſt wainſcot, or foreign oak, which is ſawed out into boards ¾ of an inch thick; theſe, after being planed, are cut in the direction of the grain, into ſlips 1¾ inches broad, and the whole length of the board, by a circular ſaw called a ripping-ſaw, ſimilar to that in *fig.* 2. except that the groove, G, and ſlider, H I, are omitted; A is the circular, or wheel-ſaw, made of ſteel plate, with fine teeth; on the end of its axis is a pulley, B, turned by a band going round it, and round a large drum under the bench, C C, driven by a horſe-wheel. In *fig.* 3. is ſhewn the manner of fixing the ſaw, A, to its ſpindle, between two pieces of metal, C and D; one of which, C, is part of the ſpindle, and the other, D, is a moveable one, puſhed towards the ſaw by a nut, E, working on a ſcrew, at the end of the ſpindle; the plane of the ſaw in the ripping machine is not fixed exactly at right angles to the bench, CC, but at the proper angle for the ſtaves of the canteen, (which are cut from theſe ſlips,) when put together to form a cylinder of the true ſize. The truth with which theſe ſaws cut, being ſo great, that the edges do not want planing. D, *fig.* 2. is the guide for the edge of the board as it is cut, which, for cutting ſlips of different widths, can be moved nearer to, or farther from the ſaw, by looſening the thumb-nut, E, the ſcrew from which moves in an opening, F, in the bench, CC, and it is always kept parallel to the plane of the ſaw, by two equal levers, L, L. A workman takes one of the boards, and puts its edge againſt the guide, D; when he puſhes it forwards, the ſaw, A, cuts it along into ſlips very quick; theſe ſlips are delivered to another workman, who uſes a ſaw, called a croſs-cutting ſaw, repreſented in *fig.* 2. the guide and ſaw of which have been before deſcribed; G, is a groove cut in the bench to receive a ſlider, H, acroſs one end of which another piece, I, is fixed, having a notch, J, in the underſide for the ſaw to paſs through, when it is ſlid forwards; the end of the ſlip, K, which is to be croſs-cut, is puſhed up cloſe to the guide, D, and the piece, I, and ſlide, H, are puſhed towards the ſaw which cuts it off inſtantly; the ſlide is then drawn back, and the ſlip, K, puſhed up to the guide, D, for another length as before. Theſe pieces, which are 4½ inches long, and 1½ inch broad, are for the ſtaves of the canteen. The ſtaves, *b*, *fig.* 1. and *fig.* 6. which have a hole in them for the cork or bung, are firſt cut out by the ſame means as the common ſtaves, but of twice the thickneſs; the piece, *a b c*, *fig.* 6. of this is cut out at once, by a machine called a tenanting or rebating machine, ſhewn in *fig.* 4. A A is a bench, in the middle of which is fixed a frame, carrying two circular ſaws, ſet at the proper angle to each other, to cut out the piece; D, is an inclined bed, with a grove, G, and ſlider, H and I, (as before deſcribed in *fig.* 2.) at the bottom of this bed, is fixed a piece of thick iron plate, E, acting as a guide to the ſtave while it is cutting: near the middle of this bed is the ſaw, *c*, the plane of which is parallel to the bed, D: a little farther on the bed is the ſaw, *d*, with its axis nearly horizontal; that end of its ſpindle which carries the ſaw, is ſupported by a crooked iron, *e*, faſtened down to the frame by ſcrews, ſo as to be capable of adjuſtment; the pulleys, *f* and *g*, on the ſpindles of the ſaws, are very near to each other, ſo that the ſame band turns them both; it firſt paſſes round a large drum, driven by a horſe-wheel, under the floor, then comes over a pulley, *h*, to change its direction; it next paſſes round the pulley, *g*, and then *f*, turning the two ſaws, (as repreſented ſeparately in *fig.* 5.) it afterwards paſſes over the two pulleys, *k* and *l*, to change its direction to the drum again: the piece of wood which receives the pulley, *l*, can be ſlid in and out of the tube, *m*, and fixed at any place by a pin, to tighten the band as it ſtretches: the piece of wood intended for the ſtave is laid againſt the croſs, I, of the ſlider, H, and held tight while it is puſhed forwards; the ſaw, *c*, cuts the plane, *a b*, *fig.* 6. and as the ſtave advances, the plane, *bc*, is cut by the ſaw, *d*, *fig.* 4. The hole, *d*, in theſe ſtaves, for the corks, are bored by the machine repreſented in *fig.* 7. A, is a ſpindle with a pulley, B, on it, turned by a band, going quite round it, and a drum (with a velocity of 1800 revolutions per minute); at the end, *a*, of this is a male ſcrew to faſten on the common borer, or centre-bit, *fig.* 8.; D and E, *fig.* 7. are two ſmooth wooden rails, for a ſlider *fig.* 9, to move upon, in the middle of which is faſtened a ſmall piece of wood, *a*, having a hole through it at *b*, and a ſhoulder at *d*; the workman takes one of the ſtaves out of the box, G, and, putting one of its ends againſt the ſhoulder, *d*, of the ſlider, *fig.* 9, and one of its edges againſt the bottom board, holds it faſt, while he puſhes it forward againſt the borer. When it is neceſſary to uſe a different ſized borer, the ſlides, D and E, and frame, H H H, which holds them, can be raiſed or lowered, and fixed by two ſcrews, I, J. The common and bung ſtaves thus prepared, are given to a workman who uſes tools repreſented by *figs.* 10, 11, and 12, Canteen. *Plate* II. *fig.* 10. is a thick block of wood, in which is turned a circular groove, *a a*, ½ an inch deep, and ¼ of an inch wide; it is for ſetting the ſtaves up in; when the groove is filled with ſtaves, the workman takes a ſcrew-hoop, *fig.* 11, which is a thin plate of ſteel, with a ſquare lump at one end, and another near the other end, to receive a ſcrew, *c*, to tighten it; the workman puts this tool over the ſtaves, as ſeen in *fig.* 13, and turns the ſcrew, *c*, until the ſtaves are brought cloſe enough, to drive on the iron truſs-hoop, *fig.* 12. Theſe cylinders, or canteens, are taken to a workman, who turns them in a lathe, *fig.* 14, where A is the pulley on the mandrill, turned by a band from a large wheel, worked by a man; B is a conical chuck, on the end of the mandrill, on which a canteen is driven by a mallet; the lathe is then ſet to work, and the ends of the ſtaves or chime turned ſmooth by a tool laid in the notch, *a*, of the reſt, C; another tool like a hook is then uſed, for cutting the groove on the inſide of the ſtaves, for receiving the head. The boards for the heads are firſt ſawn out, as before deſcribed, into ſquares 7¾ inches each ſide, theſe are cut circular by a lathe, *fig.* 15: the mandrill has a wooden chuck on one end, with four ſteel points in it; a workman takes one of the ſquare boards, G, and puts it up againſt the points in the chuck, and to confine it while it is turning, he uſes a piece of wood, D, one end, *d*, of which is placed againſt the middle of the board, and the other has a ſmall hole in it to receive the point of a ſcrew, F, working in the puppet, E; the lathe is then turned, and the board cut to the proper diameter, by a chiſſel laid in the notch in the reſt, C. The next operation is heading and hooping the canteens, which is done by knocking off one of the truſs-hoops, and putting one of the heads into the groove; the ſtaves are then tightened by the ſcrew hoop, *fig.* 11, ſo that the hoop of the canteen may be driven on; the other head is then put in, and the hoop on, in the ſame manner; and the wires, *a*, and another not ſeen, *fig.* 1, are put in; they are for receiving the belt by which the canteen is carried by the ſoldier. They are, laſtly, proved, by pouring a ſmall quantity of hot water into them, and ſtopping the cork-hole with a wooden ſtopper, when they are ſhook, and the hot water rarefying the air within, the ſame will ruſh out violently, and diſcover any ſmall leak that it may have. The ſlips of iron plate for the hoops are cut from large plates of ſheet-iron, by the ſhears, *fig.* 16. A is the centre of a ſtrong wooden lever eight feet long, which has a ſteel blade, *a a*, two feet long, fixed by three ſcrews to the underſide of it; D is a ſtrong bed ſhewn ſeparately in *fig.* 17, on the top of which the other blade, *b b*, is fixed, by three hooks, *c*, *c*, *c*, the upright legs of which go through the bed, and are fixed by three nuts; between the back of the blade and theſe hooks, three wedges, *d*, *d*, *d*, are put in; by drawing which the blade can always be brought near enough to the other blade, *a a*, to cut; C C, are two guides to ſteady the lever, B; near one end of the blade a piece of iron, *e*, is fixed on the lever, B, which acts as a ſtop to the edge of the plate, E, as it is cut; *f* is another ſtop for the ſame purpoſe, which ſlides through a hole in the bed, and is puſhed up by a ſpring, *g*, under the bed. The plate of iron, E, is puſhed forwards from behind by one man, while another is lifting up the lever, B, till it reaches the ſtops, *e*, *f*; the man at the handle then puſhes it down, and cuts the length of a hoop at once off the plate, when the lever is down the underſide of it puſhes down the ſtop, *f*, ſo that the hoop may fall off; when the lever is lifted up to cut another hoop as before. The holes for the rivets of the hoops are next punched by a machine, repreſented in *fig.* 18. A is an iron lever, having a punch fixed in it at B, under this is fixed a dove-tailed groove, C, to hold a piece of ſteel, *d*, which has ſeveral holes of different ſizes in it, to ſuit different punches, any one of which can be brought under the punch, and fixed by the ſcrews, in each ſide of the groove, C: acroſs the top of the groove, an iron plate, *e*, is fixed, with a hole in it, for the punch to go through; its uſe is to prevent the hoop, (which is put under it), after it is punched, from riſing with the punch; D is a ſcrew put into the bench, to prevent the punch from being driven too far into the hole; the boy who works this machine lifts up the lever, A, puts one end of the hoop under the plate, *e*, and then puſhes it down, which makes the hole; he then lifts it up again, and puts the other end under to make the hole in it; firſt hooking the hole before made, over the pin, E, which determines its length.

After the hole is punched, a machine, ſhewn in *fig.* 19, is uſed, to cut the ends of the hoops round; A is the lever, and B the cutter faſtened to it; C is the other fixed cutter, which can be adjuſted by a ſcrew, E, fixed to the bench; F is a guide, between which the lever, A, paſſes, to keep it ſteady; the end of the piece of iron for the hoop, is laid by the boy who attends the machine, upon the fixed cutter, C, and the handle is puſhed down to cut it off. The hoops are then bent round a block, and riveted in the common way. By theſe ingenious contrivances, the operations are rendered ſo ſimple, that a good workman will head and hoop 200 of the canteens in one day, working 14 hours; and two active men will cut with the ſhears, (*fig.* 16,) 60 hoops in a minute: great attention muſt be paid to keeping the truſs-hoops always of the proper ſize, as they are apt to expand with continual uſe, which is the reaſon of their being ſo thick, (*fig.* 12,) and if they are too large, the heads of the canteens will not fit.

CANTEL, *Cantellum*, in *Ancient Engliſh Writers*, denotes a cuſtom of ſelling by the lump, without tale or meaſure. Spelman derives the word from *quantillum*, and defines it by over meaſure, or what is added over and above ſtrict meaſure. Kennet derives it from the old word *cant*, a hundred, that is the ſale of about a hundred weight; anſwering to what we now call the taking of a hundred pound on content; as when we take it in a bag, ſealed up without telling the pieces.

CANTEL, PETER-JOSEPH, in *Biography*, was born in the dioceſe of Rouen, in 1645; and having entered into the ſociety of the Jeſuits, paſſed his days in their college at Paris, where he devoted himſelf to literature, with an ardour which haſtened the termination of his life, in 1684. His principal labours conſiſted in preparing the Delphin editions of the claſſics: and he publiſhed Juſtin and Valerius Maximus, the latter of which he enriched by ſix diſſertations on Roman affairs. He alſo wrote a treatiſe "De Romana Republica," printed at Paris, in 1684, 12mo. and eſteemed an excellent abridgment of Roman antiquities; alſo, "Metropolitanarum Urbium Hiſtoria Civilis et Eccleſiaſtica," tom. i. Paris, 1684, 4to. Nouv. Dict. Hiſtor.

CANTELEU, in *Geography*, a town of France, in the department of the Lower Seine, and diſtrict of Rouen; one league W. from Rouen.

CANTEMIR, DEMETRIUS, in *Biography*, prince of Moldavia, and a deſcendant of a noble Tartarian family, was born in 1673, and educated in part at Conſtantinople, whither he was ſent in his youth as a kind of hoſtage. Diſappointed by the Ottoman Porte in his expectations of ſucceeding his father, as prince of Moldavia, he conceived a prejudice againſt the Porte; and though he continued at Conſtantinople till the year 1710, when the war broke out between the czar Peter the Great of Ruſſia and the Porte, and was appointed by the latter, governor of Moldavia, he preferred the rank of prince of the country. With this view he violated his fidelity, and entered into an agreement of mutual aid and friendſhip with the czar. When the Ruſſian arms failed of ſucceſs, he was obliged to quit the Turkiſh territories, and to follow his new patron, who recompenſed him with the title of prince of the Ruſſian empire, ſovereignty over the Moldavians ſettled in Ruſſia, and other conſiderable appointments. His reſidence was at Charcof in the Ukraine till 1713, when he removed to Moſcow. Here on occaſion of his ſecond marriage with a Ruſſian princeſs in 1719, he ſhaved his beard, and changed his Turkiſh mien for the European. The czar made him a privy-counſellor; and Cantemir accompanied him in his different wars, conducting himſelf ſo as to gain general eſteem. In going to Derbent he was ſhipwrecked, and loſt ſeveral papers which he had taken great care and pains in compoſing. He died at his eſtate in the Ukraine in 1723. Cantemir was ſtudious and learned, and is ſaid to have underſtood 11 languages. He was the author of ſeveral works. His "Hiſtory of the Growth and Decay of the Ottoman Empire," A. D. 1300—1683, written in Latin, and publiſhed in an Engliſh tranſlation by Tindal, Lond. 1734, fol. is charged by Gibbon (Hiſt. vol. xi. p. 434.) with containing ſtrange blunders in oriental hiſtory, though he acknowledges that the author was converſant with the language, annals, and inſtitutions of the Turks. His "Syſtem of the Mahometan Religion," was written and printed in the Ruſſian language, by order of czar Peter; his moral dialogues entitled "The World and the Soul," were printed in Moldavia in Greek and Moldavian; "The preſent State of Moldavia," was printed in Latin; his "Muſical Airs with Turkiſh Words," and "An Introduction to Muſic," in Moldavian. He was alſo the author of other pieces, which were either loſt in his ſhipwreck, or ſtill remain in MS. Moreri. Gen. Biog.]

CANTEMIR, ANTIOCHUS, was the ſon of the preceding, by whom he was carefully educated, and initiated in ſtate-affairs. He was ſucceſſively ambaſſador from the Ruſſian court to thoſe of London and Paris; and, in the different revolutions of his own country, he conducted himſelf with ſingular prudence. His chief diſtinction conſiſted in his having firſt applied the Ruſſian language to the compoſition of poems of any extent or dignity; and he wrote tranſlations of Anacreon and the epiſtles of Horace, beſides various ſatires, odes, fables, &c. His ſatires, like thoſe of Boileau, were a happy mixture of ſtrong ſenſe and poetry, and many of his verſes are become proverbial in the Ruſſian language. He alſo publiſhed tranſlations in proſe of the "Plurality of Worlds," the "Perſian Letters," and "Algarotti's Newtonian Dialogues." He was a member of the academy of Peterſburg, and died in 1744. The abbé Guaſco wrote his life in French, and tranſlated his ſatires into that language. He was much inclined, at an early age, to the ſtudy of the Scriptures, and printed a "Concordance to the Pſalms," in the Ruſſian language. Nouv. Dict. Hiſt.

CANTER, WILLIAM, an eminent linguiſt and philologer, was born at Utrecht of an eminent and reſpectable family in 1542, and ſtudied firſt at Louvain, and then at Paris. Being obliged to leave Paris in 1562, on account of the civil wars, he viſited ſeveral univerſities in Germany and Italy, and at length ſettled at Louvain, where he purſued his literary occupations with an aſſiduity and ardour, which terminated his life at an early age in 1575. Thuanus ſays, that he deſerved to be reckoned among the moſt learned men of his age, and laments his immature death as a great loſs to literature. He underſtood ſix languages, beſides that of his own country, viz. the Latin, Greek, Hebrew, French, Italian, and German. Temperate, and even abſtemious in his diet, he was ſingularly methodical in the diſtribution of his time for ſtudy. He began at ſeven in the morning, and not ſooner, becauſe early riſing did not ſuit his conſtitution, and purſued his literary avocations very intenſely till half paſt eleven. He then walked out an hour before dinner, and another hour after he had dined. Having ſlept an hour upon his couch, he reſumed his ſtudies, and proſecuted them without interruption till midnight, devoting the laſt hours of the day to correſpondence with his friends, and other buſineſs that required a leſs degree of attention and labour. He had collected, during his ſhort life, a very excellent and curious library, conſiſting of the beſt authors in various languages, and a number of Greek MSS., which it was his intention to have publiſhed with Latin verſions and notes, if his life had been prolonged. The damage which his library ſuſtained from an inundation at Louvain in the winter of 1573, was an affliction, which would have proved fatal to him, if his friends had not aſſiſted him in collecting his ſcattered books and MSS., and repairing the injury they had ſuſtained. The principal works of Canter are eight books under the title of "Variæ Lectiones," containing emendations and explanations of ſeveral ancient authors, publiſhed at different times, and reprinted in Gruter's Theſaurus, tom. iii. Latin verſions of the "Caſſandra of Lycophron," of ſome "Pythagorean ethical Fragments from Stobæus," of the "Diſcourſes of Ariſtides," and of "Syneſius," &c. Notes on the "Familiar Epiſtles and Offices of Cicero," various readings on ſeveral MSS. of the "Septuagint," editions of "Euripides," of "Æſchylus," of "Sophocles," and of various other authors; and ſeveral Latin poems in the Deliciæ Poetarum Belgarum. Moreri.

CANTER, in the *Manege*, denotes the ſlow gallop, which is a ſoft and eaſy pace in which moſt people delight. Berenger (Hiſt. and Art of horſemanſhip, vol. i. p. 71.) conjectures, that our word canter, expreſſive of this pace, may owe its derivation to the Latin term "Cantherius," which was the appellation of the horſe, that uſually performed it. Dr. Johnſon, in his Dictionary, calls this pace the Canterbury gallop, and defines it to be the hand gallop of an ambling horſe, called a canter, and probably derived from the maſters riding to Canterbury on eaſy ambling horſes. "How juſt the derivation may be," ſays Berenger, "I will not preſume to decide; but the definition muſt puzzle all who are horſemen, and all who are not." See CANTHERII.

CANTERBURY, in *Geography*, is the capital of the county of Kent, and the metropolitical ſee of the archbiſhop, who is primate of all England. The preſent city occupies a ſite which, during the Roman colonization of Great Britain, was a military ſtation of that warlike people, and, according to the opinion of many eminent antiquaries, was the Durovernum of Antoninus's Itinerary. Three other principal Roman ſtations, which Mr. Somner calls *Castra Riparenſia*, were connected with this, by three different Roman roads, ſome traces of which have been diſcovered. The names of theſe ſtations, and their reſpective diſtances, are thus given by Antoninus. From Durovernum to ad portum Ritupis (Richborough) 12 miles; to ad portum Dubris (Dover) 14 miles; and to ad portum Lemanis (Lime) 16 miles. Without entering into the Roman hiſtory of this place, it may ſuffice to remark, that various relics of that people have occaſionally been found here. Beſides ſome ſeats and walls, which appear to have a Roman foundation; ſome Moſaic pavements, urns, coins, &c. that have been diſcovered, are evident memorials of that people. In the Saxon heptarchy, Canterbury, or, as then called, Cantwarabyrig, was the principal place in the kingdom of Kent, and, during the reign of Ethelbert, was conſtituted the metropolitical ſee of all England. This monarch, having given a favourable reception to St. Auſtin, and his forty monks, who landed in the iſle of Thanet in the year 597, was pleaſed to aſſign for their reſidence that part of the ancient Durovernum which is now called "Stable-gate," and which had formerly been a kind of chapel, or oratory for the royal family, where they had been accuſtomed to worſhip, and ſacriſice to their gods. The miſſionaries entered the town in proceſſion, ſinging a hymn. They were firſt reſtricted to the precincts, and, though zealous in their miniſterial functions, did not make much progreſs in converting proſelytes, till the king aſſumed, and recommended Chriſtianity. This example produced numerous converts; and ſome monkiſh chroniclers do not heſitate to aſſert, that 10,000 perſons of both ſexes were baptized in the river Swale in one day. This is too improbable to be credited in the preſent age. Auguſtin having, however, completely eſtabliſhed himſelf here, dedicated an ancient church to the honour of Chriſt, and Ethelbert founded an abbey, which was afterwards called St. Auguſtin's, the ſite, &c. of which has ſince been occupied by the biſhop's palace. (See AUGUSTIN, vol. iii.)

Canterbury is particularly diſtinguiſhed for its military, as well as eccleſiaſtical fame. Succeſſively occupied by the Romans, Saxons, Normans, &c. it became the ſcene of repeated ſieges and battles in the reſpective wars of each nation. It poſſeſſed a caſtle at the Norman Conqueſt, as it appears from the Domeſday-book that the conqueror obtained it in exchange from the archbiſhop and abbot of St. Auguſtin's. The outer walls, and valla, appear to have incloſed an area of about four acres of land. Nearly the whole of this fortreſs has been deſtroyed, and its foſſes filled up. The walls and gates, which formerly ſurrounded the city, have nearly ſuffered the ſame fate. Some of the latter remain, and parts of the former ſtill retain their original characteriſtics. The whole extent of the wall meaſured nearly one mile and three quarters in circumference. Its thickneſs, on a medium, is about ſix feet, and at certain intervals were formerly twenty-one fortified towers. Without, there was a deep foſs, nearly 150 feet wide, which environed the whole. The different entrances to the city were protected by ſix fortified gates, each of which gives name to the reſpective wards, or parts of the city, wherein they are ſituated. Beſides theſe, there were ſome ſmaller paſſages through the walls, called poſterns. Weſt-gate ſtands on a bridge, which croſſes the river Stour, and is the largeſt of theſe ſtructures. It conſiſts of two lofty ſpacious towers, embattled, portculliſed, and machicolated, and is now uſed as the city priſon. Archbiſhop Sudbury is ſaid to have built this gateway, and the wall which proceeded from it northward on the bank of the river. Further north, is a ſmall poſtern entrance, and near it is a large pile of building, called the Abbots-mill, the machinery of which was conſtructed principally from deſigns, by that great engineer, the late John Smeaton. The Northgate is very peculiar and remarkable, from having a long narrow church over it, which takes its name from the gate. Next to this, eaſtward, was Queningate, in which part of a Roman arch may yet be diſcovered on the outſide of the wall. Near this is a poſtern, which is occaſionally opened for the convenience of the deanery, and ſome of the prebendal houſes. Burgate, and St. George's gate, are in the eaſtern ſide of the wall. The latter is directly oppoſite to Weſtgate, and is conſtructed and fortified in the ſame manner. In each tower of this gateway is a ciſtern, from which pipes iſſued, to convey water to different parts of the city. Beſides theſe, there were nine other gates, which belonged to the cathedral and to the monaſtery. Some of theſe are diſtinguiſhed for their architectural ornaments; particularly that of Chriſt-Church. This, ſays Mr. Somner, is a very goodly, ſtrong, and beautiful ſtructure, and, according to an inſcription on the cornice, was built in the year 1517. The principal front of this building is highly enriched with niches, canopies, ſhields, and other ornaments. The moſt conſiderable building, and greateſt ornament of Canterbury, is the cathedral church, dedicated to Chriſt. This magnificent and ſpacious edifice diſplays the various ſtyles of architecture which characterized different ages from the eleventh to the ſixteenth century. The Danes beſieged this city in 1011, and on the twentieth day of the ſiege ſet it on fire, and completely conſumed the cathedral. Egelnothus, or Agelnoth, the archbiſhop who governed the ſee from 1020 to 1038, refounded, and made conſiderable progreſs in rebuilding this ſtructure, which was again burnt in 1067. The preſent edifice appears to have obtained its foundation from archbiſhop Lanfranc, who was invited from Normandy by the Conqueror, in 1073. He is ſaid to have completed the building, according to the then prevailing Roman ſtyle, in the courſe of ſeven years. In conſequence of accidents by fire, and the dilapidations of time, different ſubſequent archbiſhops made various alterations, additions, and improvements: but to paticularize the whole would exceed our due limits. One or two prominent circumſtances muſt ſuffice for the preſent work. Further, and very detailed particulars may be found in Dart's "Hiſtory of Canterbury Cathedral;" and in Goſling's "Walk in, and about Canterbury." In 1130, the new choir, built by archbiſhop Anſelm, was dedicated with great ſolemnity in the preſence of king Henry I. and his queen, David, king of Scotland, and many of the nobility of both kingdoms. On the 29th of December, 1170, archbiſhop Becket was barbarouſly murdered at the foot of the altar. He was buried here, where a ſumptuous ſhrine was erected to his memory, and the monks having canonized him, his tomb was reſorted to by an innumerable concourſe of pilgrims from all parts of chriſtianized Europe. This circumſtance gave more extenſive celebrity to Canterbury than any other event, and from that period the place continued to increaſe in monaſtic buildings and inhabitants, till Henry VIII. diſſolved the bigotted deluſion and the religious foundations at once. Eraſmus and Stowe have each given a particular deſcription of Becket's ſhrine, from which it appears that beſides a coffin of gold, there were many jewels, &c. employed to decorate the remains of this ſaint. (See Becket, vol. iv. p. 1.) The preſent cathedral conſiſts of a nave, ailes, choir, tranſepts; two towers riſing at the weſt end, one riſing from the centre, ſome private chapels, or oratories, a chapter-houſe, cloiſters, &c. Some of theſe buildings diſplay much ſkill and beauty in their architecture, and ſome are further ornamented by many ancient and curious monuments. Among the latter may be noticed thoſe of Henry IV. and his queen; Edward the black prince; cardinals Chatillon and Pole; archbiſhops Courtney, Chicheley, Bourchier, Walter, Reynolds, Kemp, Stratford, Peckham, Warham, Langton, and Sudbury; beſides many others erected to the memory of eminent and diſtinguiſhed characters. At a ſhort diſtance eaſt of the city walls, are the remains of St. Auguſtin's monaſtery, which was certainly the firſt Chriſtian eſtabliſhment in Great Britain. This was firſt built in 978, and though at firſt only a ſmall foundation, ſoon increaſed in extent and revenues. Patronized by a king, and under the government of a man like Auguſtin, it attracted the company and property of numerous devotees from all parts of the converted iſland; and in proportion as Chriſtianity was extended, ſo was the ſacred fame of this place propagated. At the diſſolution, Henry VIII. ſeized the town, and intended to make it a palace for himſelf. It was afterwards granted to cardinal Pole; and in 1573, queen Elizabeth kept her court here in her progreſs through Kent. The boundary wall incloſed about ſixteen acres of land. Some of the remaining buildings are appropriated to a brewery, and its fine entrance gate-way, though ſtill a beautiful object, is gradually crumbling away.

Canterbury formerly contained ſeventeen churches and pariſhes within the walls, and three in the ſuburbs; but of theſe only fifteen remain. The Jews, Preſbyterians, Quakers, Methodiſts, and Baptiſts, have each their reſpective houſes of worſhip. Among theſe buildings we may particularize the following, as having ſomething beautiful or curious to entitle them to the notice of the inquiſitive traveller. St. Martin's church, being compoſed partly of Roman brick, is conſidered the moſt ancient building in the city. St. Dunſtan's church is a large, handſome ſtructure. St. Margaret's church contains an eccleſiaſtical court, where the archbiſhop, archdeacon, &c. hold their ſeveral viſitations; and where various cauſes relating to eccleſiaſtical affairs are tried. This city is provided with many other public edifices; and its hoſpitals and other charitable eſtabliſhments are numerous. Here are two public libraries, a priſon for Eaſt Kent, a free grammar ſchool, a theatre, aſſembly rooms, and a large guild-hall, which, beſides containing ſeveral convenient apartments, is embelliſhed with ſome portraits of perſons who were benefactors to the city. The city workhouſe was eſtabliſhed by act of parliament in 1728. The name of Chaucer, and his Canterbury tales, with the Chequer inn, which was at one time occupied by our veteran poet and his fellow-pilgrims, will long be aſſociated in the memory of all lovers of old Engliſh poetry.

The corporation of the city conſiſts of a mayor, recorder, twelve aldermen, a chamberlain, town-clerk, twenty four common council men, and ſome inferior officers. It ſends two members to the imperial parliament, who are elected by the freemen, of whom there are reſident, and non-reſident, upwards of 1600. An act of parliament for paving, lighting, and watching the city was obtained in 1787, ſince which time the appearance of Canterbury has been materially improved, and its local advantages greatly augmented. The road-way of all the principal ſtreets is paved with Guernſey pebbles, and the foot-paths with Yorkſhire ſquared ſtones.

Canterbury is ſeated in a fine valley on the banks of the river Stour, which, dividing itſelf into different channels, thus forms five or ſix iſlands, ſome of which are built on, and are united to other parts of the city by bridges. At the ſouthern ſide of the walls is an artificial conical eminence, called Dane John Hill, or Dunge-Hill. This mount and its vicinity having been judiciouſly planted, and laid out in pleaſant walks, is thereby rendered a very attractive and delightful promenade to the citizens. The principal manufactories of the city are for worſted, ſilk, and cotton, and here is a manufactory for blending ſilk and cotton, or ſilk and worſted, which is known by the name of Canterbury muſlins, or ſtuffs. In the environs of the city are numerous hop plantations. See Kent.

Canterbury being a county in itſelf, its magiſtrates have authority to determine all diſputes at law between the citizens, and to try capital offences. On theſe occaſions the mayor ſits as judge, attended by the recorder, and the bench of aldermen. This city is 55 miles eaſt from London, and has markets on Wedneſdays and Saturdays, beſides ſeveral fairs. The houſes in 1800 amounted to 1799, and the inhabitants to 9000. Goſling's "Walk in and about the City of Canterbury," 12mo. 4th edition. Haſted's "Hiſtory of Kent," 10 vols. 8vo. "Kentiſh Travellers Companion," 12mo. 4th edition. King's "Obſervations on ancient Caſtles," Archælogiæ, vol. iv. p. 392, &c. Dart's "Hiſtory of Canterbury Cathedral," fol.

Canterbury, a townſhip of America, in Rockingham county, New Hampſhire, ſituated on the eaſtern bank of Merrimack river, 14 miles N. by W. from Concord, 45 N.W. from Exeter, and 54 from Portſmouth. It contains 1038 inhabitants.—Alſo, a townſhip in Windham county, Connecticut, on the weſt ſide of Quinnabang river, which ſeparates it from Plainfield; 7 miles E. by S. from Windham, and about 10 or 12 N. from Norwich.

Canterbury *Bells*, in *Botany*. See Campanula Trachelium and Glomerata.

CANTERII, or Cantherii, in *Ancient Architecture*, rafters or joiſts of a houſe, which reach down from the ridge to the eaves.

CANTH, in *Geography*, a town of Sileſia, in the principality of Breſlau, on the Wiſtritz; 12 miles S.W. of Breſlau.

CANTHARÆ, among the *Ancients*, a kind of candleſtick. See Branch.

CANTHARELLUS, in *Botany*, (Juſſ. 4. Merulius, With.) See Agaricus and Merulius.

Cantharellus, in *Entomology*, a ſpecies of Staphylinus, of a black colour, with the wing-caſes glaucous, and yellowiſh at the tip. Inhabits Sweden. *Gmelin.*

CANTHARIAS *lapis*, in *Natural Hiſtory*, a name given by ſome writers to a foſſile ſubſtance ſuppoſed to reſemble a beetle. We ſometimes meet with parts of the ichthyperia or bony parts of fiſhes, which are ridged longitudinally, much in the manner of the outer wing of ſome of the beetle tribe; and from their ſize and ſhape, which is an oblong, or oval one of the bigneſs of a common beetle, and ſometimes of the largeſt, and at others of the very ſmalleſt kinds; theſe have been called by ſome, petrified beetles and *cantharia lapides*; others have extended the name to ſuch ſpecies of amber as have in them the body or any fragment of the beetle of any ſpecies.

CANTHARIDES, in the *Materia Medica*, are beautiful green flies with a golden burniſh, found in the ſouth of France, in Spain and Italy, of very important uſe in the Materia Medica. (For the natural hiſtory of this fly, ſee Meloe *Veſicatorius*). The cantharides of Italy are the largeſt, but the Spaniſh are accounted the beſt, and are the moſt uſed, whence the inſect is alſo commonly known by the name of *Spaniſh Fly*.

When theſe flies appear in ſwarms, they are accompanied by a very diſtinguiſhable and fetid ſmell like that of mice, and this effluvium is ſo powerful, when proceeding from a large ſwarm, that perſons expoſed to it, experience ſymptoms of ſtrangury, and ardor urinæ, pain in the eyes, and violent itching over the body.

The common way of collecting theſe inſects is, to ſpread cloths under the trees containing them, to ſhake them down, and then kill them by putting them on a hair ſieve and expoſing them to the vapour of boiling vinegar, or elſe (which is the commoneſt mode) ſimply to immerſe them in vinegar and water. They are then dried thoroughly, either in the ſun or in airy chambers, being frequently turned by the hands armed with gloves. They are then well and carefully packed in cloſe wooden barrels lined on the inſide with paper. The inſect, when well dried, is ſo light as to weigh no more, on an average, than about a grain and a half.

Cantharides in this ſtate will keep well for a conſiderable time, and if in cloſe veſſels, they hardly acquire any ſmell, but in open veſſels and in the damp, they putrify in ſome degree. They are liable, however, notwithſtanding their very corroſive quality, to be attacked by very ſmall worms, which gradually crumble them to powder in every part except the wings. The acrid quality, however, is not very materially injured thereby, and remains for a great length of time, though ſlowly diminiſhing in intenſity.

The ſingularly acrid property of cantharides has led ſeveral chemiſts to endeavour by chemical analyſis, to determine in what principle it reſided. Thouvenell's experiments on this ſubject are of ſome importance. This chemiſt found four diſtinct ſubſtances in cantharides, ſome of which are doubtleſs ſtill further decompoſable. After ſoftening them with warm water, he ſubmitted them to ſtrong preſſure, which left behind about half the weight of a parenchymatous matter that was not further attended to. Hot water then extracted about $\frac{3}{8}$ of the whole weight of a yellowiſh red and very bitter ſubſtance, which gave an acid by diſtillation, and melted out a quantity of yellow oil which floated at top. This latter concretes by cooling, and has a very acrid taſte and the peculiar ſmell of the inſect. Heated with ether, it ſeparates into two diſtinct concreſcible oily matters, that are ſoluble in ether, being green, waxy, and peculiarly acrid, and the other untouched by this menſtruum, remaining yellow. The green oil is about $\frac{1}{10}$ of the whole, and the yellow oil after this has been ſeparated, amounts to about a fifth. All the active medicinal properties have been ſuppoſed to reſide in theſe oils, and eſpecially the green. The truth of this ſuppoſition is ſomewhat queſtionable to the full extent, ſince this oil is inſoluble in water, which liquid certainly extracts ſome acrid properties from the inſect, but it is yet highly probable, that it is the moſt active portion. This concrete oil being very difficult of putrefaction and more of the nature of reſin, will alſo explain why the virtue of the inſect remains ſo active after very long keeping. The whole of the active power of the inſect, both that which reſides in the oil and in the extract, is readily diſſolved by alcohol diluted with as much water; and in this way the tincture of cantharides is prepared. Something further, however, may probably be done on this ſubject by an able chemiſt who ſhould purſue this reſearch.

Cantharides have a peculiar and ſomewhat nauſeous ſmell. When taken into the mouth, no taſte is at firſt perceived, but after a while, a ſenſation of burning comes on which is very durable. Taken into the ſtomach even in the doſe of two or three grains, it produces moſt excruciating pain and ſenſation of burning, inflaming and excoriating the whole inteſtinal canal, and producing death with great agony. It alſo has a peculiar tendency to affect the urinary organs, occaſioning very acute pain and burning on paſſing the water, often attended with blood, and alſo with ſtrangury, or a painful difficulty of paſſing it. Theſe affections of the bladder often are felt in a ſlighter degree after the external uſe of this inſect.

The chief uſe to which cantharides are applied is, in Bliſters, as has already been fully deſcribed under that article, and need not here be repeated. No other known ſubſtance anſwers the effect ſo certainly, ſo extenſively, and on the whole, ſo eaſily to the patient, and hence this inſect is one of the moſt valuable articles of the materia medica. Much refinement has been attempted in the compoſition of the different bliſtering plaſters, and many additions have been propoſed, but with very dubious advantage. It does not appear that any ſubſtance can *add* to the veſicating power of the fly when freſh and good, and when a *diminiſhed effect* is wanted, the ſimpleſt and ſureſt way is, either to leſſen the quantity of the cantharides or the uſual time of its application.

The internal uſe of cantharides is juſtified by found experience, but on account of its extreme and dangerous activity, it ſhould be employed with great caution. The urinary affection is generally the firſt and moſt unqueſtionable ſign of an exceſſive doſe. It is given internally ſometimes in dropſy, but chiefly in debility of the urinary and generative organs. Camphor is ſaid to check the diſpoſition to ſtrangury, but this is extremely doubtful. Opium is more certainly an uſeful addition. The doſe of the fly in ſubſtance is about half a grain, and can ſeldom be borne oftener than once, or at moſt, twice a day. The tincture of cantharides is alſo uſed internally in doſes of from ten to twenty drops. Beſides the above-mentioned uſes of this medicine, the tincture has often been found of ſingular ſervice joined with decoction of elm-bark or ſarſaparilla, in obſtinate cutaneous diſeaſes. The tincture is uſed externally as a ſtimulating application.

CANTHARIFERA, in *Botany*, (Rumph. Amb.) See Nepenthes Destillatoria.

CANTHARINUS, in *Entomology*, a ſpecies of Cerambyx, (Saperda Fabr.) that inhabits Germany. The colour is ferruginous: thorax cylindrical, with the antennæ and legs black. Fabr. Linn. &c.

Cantharinus, in *Entomology*, a ſpecies of Cimex. The colour of this inſect is black: thorax armed with a ſingle tooth, and marked with a white circle: wing-caſes cinereous, with four yellow ſpots: ſcutel yellow. A native of Denmark. Mull. Zool. Dan.

CANTHARIS, in *Entomology*, a genus of Coleopterous inſects diſtinguiſhed by having the antennæ filiform: thorax in general margined, and ſhorter than the head: wing-caſes flexile: ſides of the abdomen edged with folded papillæ. Linn. &c.

The ſpecies of this genus Gmelin divides into three ſections, the firſt containing thoſe which have four hatchet-ſhaped feelers; the ſecond, thoſe with filiform feelers, the laſt joint of which is ſetaceous, (or true Malachius of Fabricius); and the Lymexyla, or thoſe having the anterior feelers projecting, the laſt joint but one, with a large ovate cleft appendage, and the laſt joint ovate and acute. The ſpecies are theſe:

*Section* 1, virideſcens, fuſca, marginella, media, haematoſtoma, punctata, dichroa, multicolor, livens, diſtincta, exuſta, livida, rufa, obſcura, limbata, lateralis, ſmaragdula, biguttata, minima, cardiacæ, albicans, teſtacea, atra, marginata, bimaculata, pallipes, pallida, ruficollis, flavipes, melanocephala, bipunctata, angulata, nigra, pulicaria, caneſcens, coccinea, bicolor, bilineata, trilineata, altica, oculata, collaris, cuprea, argentea, janthina, americana, rufipes, berolienſis, fulva, ſerrata, tropica, ſonchi, caſpica, flaveola, violacea, vireſcens, lepturoides, nigripes, melanura, hiſtrio, picea, chalybea, tricolor:

*Section* 2, æuea, bipuſtulata, hæmorrhoidalis, viridis, ſanguinolenta, cyanea, pedicularia, nemoralis, faſciata, equeſtris, ochropus, chryſomeloides, cæruleocephala, ſuecica, Herbſtii, erythromelas:

*Section* 3, abbreviata, proboſcidea, barbata, navalis, ſaxonica, morio; which ſee reſpectively.

Obſ. The Fabrician genus *Cantharis*, includes only thoſe Linnæan ſpecies of the genus that have four hatched-ſhaped feelers: jaws bifid; lip entire; and antennæ filiform.

CANTHARIUM, in *Ancient Geography*, the moſt weſtern promontory of the iſle of Samos.

CANTHARUS of a *Fountain*, among Roman writers, denotes the part, or apparatus, out of which the water iſſued.

It was made in divers forms, ſometimes in that of a ſhell, at other times in that of an animal, which yielded water at its mouth, eyes, and the like.

Cantharus, in *Eccleſiaſtical Writers*, denotes a fountain, or ciſtern, in the middle of the atrium, before the ancient churches, wherein perſons waſhed their hands and faces before they entered.

Cantharus, in *Ichthyology*, a ſpecies of Sparus. The tail is immaculate, and the body lineated longitudinally with yellow. Linn. Arted. &c. Inhabits the Mediterranean.

CANTHELEA, or Canthalia, in *Ancient Geography*, a maritime town of Africa, in the territory of Curubis, and in the vicinity of Carthage. This town is ſaid to have received its appellation from the Pagan deity Saturn; ſince, according to Sanchoniatho and Damaſcius, the word *el* in the Phœnician tongue had a particular relation to that deity. In confirmation of this opinion it is added, that there was a town in that place called "Vicus Saturni," the ſtreet or town of Saturn, where Jerome is ſaid to have lodged during his exile in Curubis.

CANTHERII, in *Antiquity*, a general name applied by the Romans to horſes uſed on many different occaſions, but which was always underſtood to mean "geldings." Many unſatisfactory conjectures have been formed concerning the etymology of this word. The beſt explanation, ſays Berenger (Hiſt. &c. of Horſemanſhip, p. 71,) ſeems to be that which deduces it from the Greek, κανθελιος, canthelion, which, by no unuſual change of one letter for another, may be made "cantherion;" ſignifying, in its original ſenſe, a pack-ſaddle; and as it was uſual to caſtrate the "cantherii," or pack-horſes, in order to make them gentle and quiet, it became a cuſtom to call all caſtrated horſes, "cantherii," though appointed to other ſervices beſide that of carrying packs or burdens. In proceſs of time, people, who, for various reaſons, rode on horſeback, began to prefer theſe cantherii, or geldings, for their calmneſs of temper, to other horſes.

CANTHI Colpus, or Irinus, in *Ancient Geography*, a gulf of India, according to Ptolemy, into the northern part of which the river Indus diſcharged itſelf.

CANTHI Statio, a port of the Indian ſea, to the weſt of the moſt weſtern mouth of the river Indus.

CANTHIUM, in *Botany*, a genus formed by La Marck and adopted by Juſſieu, for two plants nearly allied to Gardenia and Coffea; but ſtated by La Marck to differ from the former in their two-ſeeded berries, and from the latter, in their ſhort flowers and ſimple ſtigma. One of them is Gardenia ſpinoſa of the younger Linnæus, G. Dumetorum of Willdenow, which ſee; for the other, ſee Webera *Tetrandra*. As La Marck has not inſerted this genus in his Illuſtrations, he appears to have ſince formed a different judgment concerning it: but as the detail of ſpecies in that work is not yet completed, it cannot be determined in what manner he would now diſpoſe of theſe two plants. We have followed the arrangement of Willdenow.

CANTHUS, in *Anatomy*, the junction of the ſuperior and inferior eyelids. Hence there is an internal and an external canthus. Theſe parts are alſo called the angles of the eye; that which is towards the noſe being termed the inner or greater angle; and that which is towards the temple, the outer or leſſer angle of the eye.

Canthus, in *Chemiſtry*, the lip of a veſſel; or that part of the mouth of a veſſel, which is a little hollowed, or depreſſed, for the eaſy pouring off a liquor.

Hence, to pour by decantation, is to pour through that place.

Canthus, in *Entomology*, a ſpecies of Papilio (*Dan. Feſt.*)

*Feſt.*) that inhabits North America, the wings of which are entire, and fuſcous above: anterior pair immaculate: on the upper ſurface of the poſterior ones ſix ocellar ſpots. *Fabr.* &c. Obſ. This inſect is noticed by Linnæus (*Amoen. Acad.*) under the name of Papilio Eurydice, and it is alſo Papilio Argante of Cramer.

CANTI, *Carnaſcialeſchi.* Songs ſung through the ſtreets of Florence in the Carnival, by perſons in maſks, during the time of Lorenzo il Magnifico. Theſe ſongs, after the manner of the Greek *ſcolia,* were applicable to perſons of different trades and occupations; among the reſt there is one for thoſe who played on the rebec, the trumpet, and various inſtruments of muſic uſed in the German troops, called by the Italians, *Lanzi.* The firſt of theſe ſongs that were performed in this manner, were ſet by Arrigo Tedeſco, Maeſtro di Cappella of the church of St. John, and a muſician of great eminence, of whoſe compoſitions various ſpecimens are preſerved by Glarianus. Ant. Franceſco Grazzini, commonly called, *Il Laſca,* collected and publiſhed the words of theſe ſongs in 2 vols. 8vo., under the title of *Tutti i trionſi, Carri, Maſcherate o* Canti Carnaſcialeſchi *andati per Firenze* dal tempo del magnifico Lorenzo de' Medici ſino al anno. 1559. The poetry of theſe ſongs is ſtill in great favour with the Florentines.

CANTICLE, a hymn or pious ſong: as, *the Song of Songs,* by Solomon. The firſt and moſt ancient canticles were compoſed on occaſion of great and memorable events, and ſhould be ranked among the moſt ancient hiſtorical monuments. Canticles were ſung in Chorus, and often accompanied with dances, as appears in the ſacred writings, where the moſt conſiderable compoſition of this kind is the *ſong of ſongs,* which ſome authors imagine to be an epithalamium, compoſed by Solomon on his own nuptials with the daughter of the King of Egypt. But theologians find under this allegory, the union of Chriſt and the church. M. Cahuſac ſaw nothing in the *ſong of ſongs,* but a regular opera: the ſcenes, recitatives, duets, choruſſes, every thing neceſſary to an opera, according to him, is contained in this *canticle,* and he doubts not but that it has been repreſented. *Rouſſeau.*

CANTICLES, or *the Song of Songs,* in *Biblical Hiſtory,* a Hebrew mode of expreſſion to denote a ſong ſuperlatively excellent in ſtile and ſentiment. Of this ancient poem the author is aſſerted, by the unanimous voice of antiquity, to have been Solomon; and this tradition is corroborated by many internal marks of authenticity. In the very firſt verſe it is ſaid to belong to Solomon: he is the ſubject of the piece, and the principal actor in the conduct of it. Alluſion is made to the rich furniture of his palace, chap. i. 5.; to the horſes and chariots which he purchaſed of Pharaoh king of Egypt, i. 9. 1 Kings x. 28, 29.; to Amminadab, who was eminent for ſuch chariots, and who married one of Solomon's daughters, vi. 12. 1 Kings iv. 11.; to his building of the temple, under the figure of a palanquin or couch for his bride, iii. 9, 10.; to the materials of which it was formed brought from Lebanon and other hills, iv. 8. In a word, all the leading circumſtances of Solomon's life in a religious view appear to be alluded to, or implied in this ancient poem, and therefore render it probable that it was a production of ſome writer in his age, if not his own compoſition.

That the Song of Songs, from the moſt early period, was deemed a ſacred book, and ranked with the Hagiographa of the Jews, and thence received among the canonical books of the Old Teſtament, may be inferred from the following conſiderations. A tranſlation of it is aſcribed to the ſeventy Jews, who flouriſhed about 300 years before Chriſt, and which ſtill forms a part of the Alexandrian verſion. With the ſame conviction of the ſacred character of the work, it was rendered into Greek, in the ſecond century, by Aquila, Symmachus, and Theodotion. Origen, on the authority of the Jews, contemporary with him, and whom he was in the habit of conſulting reſpecting the authority and literal import of their ſacred books, inſerted it in his *Hexapla,* and wrote ſome homilies upon it, explaining its myſtical ſenſe, which have in part been tranſlated into Latin by Jerome. That the ancient Jews, without exception, conſidered it as a production divinely inſpired, appears moreover from the allegorical ſignification annexed to it by the Chaldee paraphraſe. Joſephus, in his anſwer to Apion, lib. i. 38, gives a catalogue of the Jewiſh books, and includes in the third claſs of ſuch as related to moral inſtruction the Song of Songs. See Bible and Canon. Euſebius, alſo, following his footſteps, makes it the fifteenth of that number. See his Eccleſ. Hiſt. lib. vi. cap. 25. From the Jewiſh ſynagogue the book of Canticles was received into the Chriſtian church, without any doubt of its divine authority. This appears from Origen and Euſebius. It is cited by Ignatius, about the beginning of the ſecond century, as a book of authority in the church at Antioch. It is included in the canon of the apoſtles. See Canon. And in the apoſtolical conſtitutions, a paſſage from the Canticles is quoted. Con. vi. 13. 18. See Constitutions, *apoſtolical.*

Though the Song of Songs comes down to us recommended by the voice of antiquity, its divine authority has been called in queſtion by many writers in modern days. Whiſton thinks it a diſſolute love ſong, compoſed by Solomon when advanced in years, and degenerate in practice; and that therefore it ought to be excluded from the canon of the ſacred books. Taken indeed in its primary and literal ſenſe, it muſt be conſidered as deſcribing a royal marriage, and may therefore be denominated an *epithalamium* or *hymeneal ſong.* The celebrated Michaelis ſuppoſed that the object of it *was to teach God's approbation of marriage.* But the ideas of Harmer appear much more rational, who, though unwilling to give it the name of *epithalamium,* thinks it a marriage ſong to be explained by compoſitions of a ſimilar nature in eaſtern countries. "What can be more likely," ſays he, "to lead us into the literal ſenſe of an ancient nuptial poem than the comparing it with ſimilar modern productions of the Eaſt, along with antique Jewiſh compoſitions of the ſame kind?" Boſſuet, biſhop of Meaux, was of opinion that this ſong was to be explained by the conſideration, that the Jews were wont to celebrate their nuptials for ſeven days together, diſtinguiſhed from each other by different ſolemnities: and this notion has been adopted by the author of "A new Tranſlation of Solomon's Songs, with a Commentary and Annotations." The principal objection to this opinion is, that the conduct of the poem does not admit of ſuch a diſtribution; and the diſtinguiſhing each day by ſome diſtinct ceremony is a mere ſuppoſition unſupported by fact.

The elegant and learned biſhop Lowth devotes two of his *Prælectiones* to an examination of this poem, and he determines it, with Boſſuet, to be a *ſacred drama,* though deficient in ſome of the eſſential requiſites of dramatic compoſition. Sir W. Jones, from his knowledge of Eaſtern poetry, was led to compare ſome parts of it with ſimilar productions among the Arabians, and delivers it as his opinion, that it is to be claſſed with the Hebrew idyls. Poeſ. Aſiat. Com. p. 92. Supported by the high authority of this illuſtrious ſcholar, Mr. M. Good, in an elegant metrical verſion with which he has favoured the public, conſiders the Song of

Songs as forming not one continued and individual poem, but a ſeries of poems, each diſtinct and independent of the other; and he denominates them *ſacred idyls.* "The Song of Songs," he ſays, "cannot be one connected epithalamium, ſince the tranſitions are too abrupt for the wildeſt flights of the Oriental muſe, and evidently imply a variety of openings and tranſitions; while, as a regular drama, it is deficient in every requiſite that could give it ſuch a claſſification." In oppoſition to this it may be remarked, that the ſubject of the poem, from beginning to end, is the ſame; the perſonages, introduced as ſpeakers, are the ſame; and, though to a modern reader the tranſitions in many places may ſeem abrupt, and the thoughts unconnected, the conduct of the piece is not ſuſpended, but carried on under a fable regularly conſtructed, and terminating in a concluſion intereſting and unexpected. The apparent want of connection in the ſentiments of an ancient dramatic compoſition muſt be manifeſt; and it is the buſineſs of a critic to remove thoſe cauſes, by pointing out the place of repreſentation; by aſſigning to the proper characters their reſpective ſpeeches; by unfolding in the hiſtory of the times, the event on which the fable is conſtructed; by marking the commencement and cloſe of the ſeveral acts or ſtages of the action: in a word, by conveying his own imagination, and that of his reader, to the place of exhibition, and thus calling the eye, as it were, to the aſſiſtance of the ear in developing the unity of the ſubject, and ſupplying the ſmoothneſs of the tranſitions.

Having thus produced the ſentiments of others reſpecting the nature and object of the Canticles, we ſhall next briefly ſtate thoſe of an ingenious friend, who conſiders it, for the reaſons which he has adduced, as a parable in the form of a drama.

Firſt, When cloſely examined, it will appear to poſſeſs all the eſſential qualities of a *drama.* The marriage of Solomon with the daughter of Pharaoh, (as related 1 Kings i. 1.) a political event which, from the perſonages concerned in it, would be intereſting to the Jewiſh nation, was, as ſuch, proper to furniſh the fable of it. The writer is entirely left behind the curtain, and the whole of the compoſition is brought forward before the reader in parts between the ſpeakers. The *dramatis perſonæ* are Solomon, the bride, her attendants, and the virgins of Jeruſalem. It ſhould be obſerved, though the fact has indeed been overlooked by the critics, that all advance is made by the lady herſelf. She comes to his palace *unfetched*, and apparently *unſolicited.* Finding him not there, ſhe goes in ſearch of him, intreats to be received into his embrace; and when, without denying, he eludes her intreaties, ſhe purſues him in the ardour of her affection almoſt beyond the bounds of female delicacy and modeſty. On the contrary, the royal ſpouſe is cold at heart, and diſtant, prone to recede, and to intrigue with his favourite concubines, but anxious to conceal his indifference and infidelity under laboured encomiums on the beauty of his ſpouſe. The action is complete, poſſeſſing a beginning, a middle, and an end, and compoſed of ſcenes, the ſhifting of which, if obſerved by a modern reader as by an ancient ſpectator, would have preſerved the conduct of the piece uniform and conſiſtent. The plot, it muſt be allowed, is very ſimple, the intricacies of it ariſing only from thoſe unforeſeen impediments which were thrown by rival beauties in the way of the royal bride, and which threatened to deprive her of the object of her attachment. The cataſtrophe is the triumph of honourable love over the allurements of ſeduction, and the ſecurity of virtuous enjoyment over the torments of jealouſy and illicit fruition.

Secondly, Conſidered as a *parable*, like other parables, while it conveys a literal ſenſe intereſting and appropriate, it conveys likewiſe a religious leſſon of ſupreme importance. Now the method of decyphering a fable or parable is, not by ſeeking under the veil of the allegory certain maxims of recondite wiſdom, which bear no reſemblance to the literal ſenſe, but by facts generally known and fully underſtood: nor is the interpretation to be deemed *true*, unleſs, as in the caſe of the parable of Nathan or that of the ſower, there ſubſiſts an obvious and characteriſtic analogy between the ſimple and the metaphorical acceptation. On this principle, it is apprehended that, in the parable of the Canticles, the bride means the *Jewiſh religion*, and the royal ſpouſe the *Jewiſh nation*, repreſented under the name and perſon of their ruler and chief; and the object of it is to delineate, under images borrowed from the connubial ſtate, the conduct of the Iſraelites at large, and that of Solomon in particular, in reſpect to their knowledge and worſhip of Jehovah. In proof of this poſition, it will be neceſſary to ſpecify a few leading particulars.

1. The relation ſubſiſting between Jehovah and the Jews, as his choſen people, is uſually deſcribed, in the Jewiſh writings, in language expreſſive of the relation between a huſband and the woman who is the object of his peculiar affection and choice. See Iſa. liv. 5. Jer. iii. 1. Ezek. xvi. xxiii. Hoſ. i. Mat. ix. 15. xxv. Rev. xix. 7.

2. The deſcription, given in the poem, of the royal bride conſiſts of thoſe figures and alluſions which, in other parts of the Jewiſh ſcriptures, are employed to delineate the character of *true religion.* Thus ſhe is ſaid to be a *fountain*, to be a *garden*, to have a *vineyard*, to be *more delicious than wine.* See Iſa. v. 1. Mark xii. 1. Iſa. xii. 2, 3. John iv. 14. vii. 37. Pſ. xix. 10.

3. While the royal lover is laviſh of his encomiums on the beauty of his bride, he was cold and faithleſs, and all advance is made by herſelf. This delineates with exactneſs the character of the Jews, with reſpect to their religion. It was beſtowed upon them unaſked and undeſerved. While loud in praiſe of their worſhip, they were ever prone to the idolatry of their neighbours; and the God they were forſaking ceaſed not, as it were, to purſue them, and to ſolicit their return to him. We read of Solomon, (1 Kings i. 1—7.) that the ſtrange women he married were the means of ſeducing his heart from God; and the bride ſeems to have been ſenſible that the virgins, with whom he aſſociated, were the cauſe of alienating his affections from her, and ſhe repeatedly intreats them *not to ſtir up nor awake her beloved.*

4. Solomon built a temple in which the knowledge and worſhip of the true God might be cultivated; and the ſervice of the temple was appointed by the wiſdom of heaven to be but an introduction to the more rational ſervice of the Chriſtian church. For this reaſon, the temple might be conſidered as the *cradle* or *couch* in which the Jewiſh religion was to be nurſed, and, as it were, to be conveyed home to her parent's houſe; that houſe of which God was the owner and author, and of which Chriſt was the chief corner-ſtone. Accordingly the royal lover is repreſented as making a couch for the bride. In this grand palanquin ſhe is conveyed home with her huſband; and here ſhe expects to enjoy his undivided attachment, without any apprehenſion from the ſeductive arts of her rivals. And it is certain that thoſe of the Jews who paſſed over from the temple to the Chriſtian church never afterwards relapſed to idolatry, but ever remained faithful to the worſhip of the true God.

5. The temple being made of the wood of Lebanon, the bridal couch is, for this reaſon, repreſented as made of the ſame timber. Hence with much propriety the royal lover invokes his bride to come from Lebanon, and other hills,

whence the materials for the temple were brought; and hence too, with equal propriety, the language in which the huſband celebrates the accompliſhments of his ſpouſe is copied from that temple which was devoted to her ſervice.

6. When they arrived in the parent's houſe, ſhe informs her huſband, "We have a ſiſter who is little, and hath no boſom." Which means that, when the Jewiſh temple was exchanged for the church of Chriſt, Judaiſm itſelf pointed out the goſpel diſpenſation, which being in its infancy encumbered with rites and ceremonies, had not yet all its vigour and purity. To the information of the bride reſpecting her younger ſiſter the king replies, "If ſhe be a *wall*, we will build for her a palace of ſilver; and if ſhe be a *door*, we will encloſe her with boards of cedar." Which is to this effect: "If the new religion, the younger ſiſter, be intended as a wall or an additional *ſecurity* of the old; if the religion of the goſpel prove an auxiliary to the ſervice of the temple, we Jews will erect for her portion a ſplendid reſidence; we will adopt her as a beautiful appendage of Judaiſm: but if, on the other hand, ſhe will aboliſh the Levitical code, and throw open a *door* to receive the Gentiles to the privileges of the Jews, we will reject her, and endeavour to cloſe up the *breach* which ſhe has made in our diſpenſation." The anſwer of the bride is remarkable: "*I am a wall*;" by which ſhe delicately hints that *ſhe* was the means of encloſing the choſen people of God, and of ſeparating them from the idolatry of their neighbours; but that her younger ſiſter was intended to remove this wall of ſeparation, and to unite the Gentiles with the Jews in the knowledge and worſhip of the true God."

7. The gradual expanſion of revelation, from the firſt dawn of it in the garden of Eden till it reached its meridian effulgence, in conſequence of the death and reſurrection of Chriſt, is thus beautifully pourtrayed in the character of the bride: "Who is ſhe that looketh forth as the *morning*, fair as the *moon*, bright as the *ſun*, and ſerene as the *ſtarry hoſts*?"

Finally, The royal huſband addreſſes his bride as being at the ſame time his ſiſter, *My ſiſter, my ſpouſe*. Theſe two inconſiſtent relations are now eaſily explained. The father of the huſband, the Creator of the Jews, was alſo the author of their religion. The bridegroom and the bride, being deſcended from the ſame great Parent, were alſo a brother and ſiſter.

The metaphorical ſenſe thus capable of being put upon every part of this poem, juſtifies the high appellation of *The Song of Songs*, which has ever been given it. It accounts alſo for its being regarded, by Jews and Chriſtians, as a *ſacred compoſition*, and for its reception firſt into the Jewiſh, and then into the Chriſtian canon. On its firſt publication its allegorical import muſt have been generally underſtood; and it was natural that, as with the proceſs of time it became unintelligible, it ſhould ſtill retain the high rank and eſtimation which at firſt it ſo juſtly acquired. It was alſo equally natural in the firſt Chriſtian writers, on receiving it into the canon of the Jewiſh ſcriptures, but without knowing the true ſignification of it, to interpret it as referring to Chriſt and his church. The interpretation, however, though adopted by moſt modern divines, has only involved it in myſtery, fancy, and abſurdity; and the conſequence was that its claims to inſpiration have been called in queſtion; nor is there any means of reſtoring it, in the eſtimation of rational critics, to the ſacred writings, but by diſcloſing the beautiful leſſon of religious wiſdom concealed under the veil of its allegory. The epilogue, reſpecting the younger brother and ſiſter, demonſtrates that its views terminate in the temple ſervice. While, at the ſame time, the alluſion at the cloſe to the riſe of the goſpel, and the converſion of the Gentiles, which took place ſo many hundred years after Solomon, proves that the author was actuated by divine inſpiration.

CANTICUM, Latin, in *Muſic*, a motet, anthem, or ſacred ſong.

CANTII, in *Ancient Geography*, a people of Albion, or Britain, who inhabited that part of the country which from them was called *Cantium*. See CANTIUM.

CANTILENA, in *Muſic*, an Italian word equivalent to melody, the treble, the principal part of a compoſition, oppoſed to the repieno, or under parts, either in inſtrumental or vocal muſic.

CANTILLANA, in *Geography*, a town of Spain, in the country of Seville, ſeated on the Guadalquiver; 11 miles N.W. of Carmona.

CANTIMARONS, or CATIMARONS, a kind of floats or rafts, uſed by the inhabitants of the coaſt of Coromandel to go a fiſhing in, and to trade along the coaſt. They are made of three or four ſmall canoes, or trunks of trees dug hollow, and tied together with cacao ropes, with a triangular ſail in the middle, made of matts. The perſons who manage them are almoſt half in the water, there being only a place in the middle a little raiſed to hold their merchandiſe; which laſt particular is only to be underſtood of the trading cantimarons, and not of thoſe who go fiſhing.

CANTING-ARMS, among *Heralds*, are thoſe arms which expreſs their owner's ſurname. Theſe anſwer to what the French call *armes parlantes*; they are a ſort of rebuſes, and are never preſumed to be noble. See ARMS.

CANTING-*quoins*, in *Ship Building*, the ſame as *cantic-quoins*. See CANT and QUOIN.

CANTIŒBIS, in *Ancient Geography*, a town of Germany, placed by Ptolemy near the Danube.

CANTIUM, as it is called by Cæſar and Ptolemy, CANTIA of Bede, now *Kent*, derives its name and that of its inhabitants, moſt probably, from the Britiſh word "Cant," which ſignifies an angle or corner, and applied to this part of Britain from its form and ſituation. It is ſeparated from the continent by a narrow ſea, called by Solinus "Fretum Gallicum," but by Tacitus and Ammianus Marcellinus "Fretum Oceani," and "Oceanus Fretalis." The places of Cantium mentioned by the ancients are Durovernum, Durobrivis, Durolenum, Portus Rutupiæ, Portus Dubris, Regulbium or Regulium, and Portus Lemanus, now Canterbury, Rocheſter, Lenham, Richborough, Dover, Reculver, and Leine. Ptolemy reckons Londinum, London, among the cities of the Cantii; but in this particular he was certainly miſtaken. This was probably the firſt diſtrict of Britain which received a colony from the continent; and it is no leſs probable that it had frequently changed its maſters, by new colonies, who came over from time to time, and drove the inhabitants farther north. Amidſt all its revolutions it retains its appropriate name, and it was transferred to all the ſucceſſive tribes by which it was inhabited. At the time of the Roman invaſion its inhabitants were evidently of Belgic origin, who had arrived at ſo late a period, that they differed in no reſpect from their countrymen on the continent. "The inhabitants of Kent (ſays Cæſar, Bell. Gall. l. v. c. 10.) are the moſt civiliſed of all the Britons, and differ but very little in their manners from the Gauls." This reſemblance was owing to the proximity of their ſituation, which, being neareſt to the continent, was moſt frequented by emigrants from thence. It was this ſituation, alſo, that expoſed them to the firſt aſſaults of the Romans. Cæſar, in both his expeditions into this iſland, landed in Kent; and therefore we may conclude, that the Cantii were principally concerned in the vigorous oppoſition that was made to his landing, and in the ſeveral ſkirmiſhes and battles that were fought againſt him after his landing; particularly, they made a very bold but unſucceſsful attempt upon his naval camp. Their reſiſtance, however, was leſs vigorous on the next invaſion of the Romans, in the reign of Claudius; for we learn from Dio (l. lx.) that Aulus Plautius, the Roman general in that expedition, traverſed their country without ſeeing an enemy; and as they now ſubmitted to the power of Rome without a ſtruggle, ſo they continued in a ſtate of quiet ſubmiſſion to it to the very laſt. Cantium, in the moſt perfect ſtate of the Roman government, formed a part of the province which was called "Flavia Cæſarienſis." Henry's Hiſt. vol. i. p. 253, 8vo.

CANTO denotes a part or diviſion of a poem, anſwering to what is otherwiſe called a book. The word is Italian, and properly ſignifies ſong. Taſſo, Arioſto, and ſeveral other Italians, have divided their longer or heroic poems into cantos. In imitation of them Scarron has alſo divided his Gigantomachia, and Boileau his Lutrin, into *chants* or ſongs. The like uſage has been adopted by ſome Engliſh writers, as Butler, who has divided his Hudibras, and Dr. Garth his Diſpenſary, into cantos. A tranſlator of part of Virgil's Æneid, has even ſubdivided a book of Virgil into ſeveral cantos.

Canto, *Ital.* a ſong, part of a poem. *Il canto*, in *Muſic*, implies the firſt treble of a vocal compoſition, in four parts. In a chorus of more than four parts, there is frequently a ſecond canto; as *canto* 2do. the ſecond treble. *Canto fermo*, plain chant, *canto Gregoriano*, the Gregorian chant, or the chant inſtituted by pope Gregory, written in the Roman miſſals, in ſquare black notes, on three or four lines only. *Canto figurato*, florid counterpoint.

CANTOCRA, in *Geography*, a town of Piedmont, 22 miles N.N.W. of Turin.

CANTON, John, in *Biography*, an ingenious natural philoſopher, was born at Stroud in Glouceſterſhire, July 31, 1718, O. S.; and having, at an early age, made a conſiderable proficiency in mathematics, under the tuition of a ſchoolmaſter in his native town, he was taken from ſchool to learn the buſineſs of his father, which was that of a weaver of broad cloth. This employment, ſo unſuitable to his faculties and views, did not reſtrain his ardour in the proſecution of ſcience; and his acquaintance with aſtronomy was at this time ſo conſiderable, that by the help of the Caroline tables he computed eclipſes of the moon and other celeſtial phenomena. He alſo conſtructed ſeveral kinds of dials. In his favourite purſuits he encountered many difficulties and diſcouragements; but devoting thoſe hours to ſtudy, which the family ſpent in ſleep, and reduced to the neceſſity of ſecreting a candle for this purpoſe, he made ſuch progreſs that he was able to conſtruct, with a common knife, an upright ſun-dial of ſtone, which ſerved to ſhew not only the hour of the day, but the riſing of the ſun, his place in the ecliptic, and ſome other particulars. This dial was placed in the front of his father's houſe, and as it excited the admiration of ſeveral neighbouring gentlemen, it was the means of introducing him to their acquaintance, and of gaining for him an acceſs to their libraries. In one of theſe libraries he found Martin's Philoſophical Grammar, in the peruſal of which he firſt acquired his taſte for natural philoſophy. In another library he met with a pair of globes, the uſe of which facilitated his ſolution of various problems. At this time he had the happineſs to be introduced to the acquaintance and patronage of the Rev. Dr. Henry Miles, a diſſenting miniſter at Tooting, near London, well ſkilled in natural knowledge, and a reſpectable member of the Royal Society. Mr. Canton accompanied Dr. Miles to London, in 1737, and after reſiding with him for ſome time, he articled himſelf for five years as an aſſiſtant to Mr. Samuel Watkins, maſter of an academy in Spital-ſquare. Having recommended himſelf in this ſubordinate ſituation, by his ingenuity, application, and good conduct, he was taken into partnerſhip by Mr. Watkins in 1742, and afterwards ſucceeded him in his ſchool, where he remained till his death. The ſcience of electricity had for ſome time engaged the attention of Mr. Canton; and after the diſcovery of the Leyden phial towards the cloſe of the year 1745, he made it the object of his particular inveſtigation, and in the following year his method of determining the quantity of electricity accumulated in it was communicated by Dr. William Watſon to the Royal Society. His mode of doing this, as Dr. Prieſtley obſerves, in his "Hiſtory of Electricity," had a near affinity to the diſcovery of Dr. Franklin. Towards the cloſe of the year 1749, he aſſiſted his friend Benjamin Robins, Eſq. in his experiments for aſcertaining the height to which rockets aſcend, and the diſtance at which their light may be ſeen. In January, 1750, Mr. Canton communicated to the Royal Society his "Method of making *artificial magnets*, without the uſe of, and yet far ſuperior to any *natural* ones." The diſcovery of this method had been made ſome time before; but Mr. Canton, from motives of delicacy, with reſpect to Dr. Gowin Knight, delayed the publication of it, till he was urged to it by Martin Folkes, Eſq. This communication was ſoon followed in the ſame year by his being elected a member of the Society, and by his receiving its gold medal. In this year he was alſo complimented with the degree of Maſter of Arts, by the Univerſity of Aberdeen; and, in 1751, he was choſen one of the council of the Society. On occaſion of the change of the ſtyle in 1752, he gave to the earl of Macclesfield ſeveral memorial canons for finding leap-year, the dominical letter, the epact, &c. which were afterwards publiſhed by Dr. Jennings in his "Introduction to the Uſe of the Globes."

In 1752, Mr. Canton had the honour of being the firſt perſon in England, who, by drawing the electric fire from the clouds, during a thunder-ſtorm, verified Dr. Franklin's hypotheſis of the ſimilarity of lightning and electricity. In 1753 his paper, entitled "Electrical Experiments, with an Attempt to account for their ſeveral Phenomena," was read at the Royal Society. This paper, as well as another communicated to the Society in 1754, contains ſome curious facts and diſcoveries, of which an account will be given in the *Hiſtory of* Electricity. Mr. Canton, in 1752, ſent to the editor of the Lady's Diary a ſolution of the prize queſtion for that year, explaining the phenomenon of the "ſhooting of ſtars." The anſwer was anonymous; but Mr. Thomas Simpſon, who then conducted the Diary, ſent the prize to Mr. Canton, accompanied with a note informing him that, though he had concealed his name, he knew him to be the author, becauſe no one elſe could have anſwered the queſtion. Our author's next communication to the public was a letter in the Gentleman's Magazine for September, 1759, on the electrical properties of the tourmalin; which ſee. In the ſame year the Royal Society received a paper, entitled, "An Attempt to account for the regular diurnal Variation of the horizontal Magnetic Needle, and alſo for its irregular Variation at the Time of an Aurora Borealis." Mr. Canton's obſervations on the tranſit of Venus were communicated to the Royal Society in November 1761; and in 1762, a letter addreſſed by him to Dr. Franklin was read, containing remarks on Mr. Delaval's electrical experiments; in December of the ſame year his curious paper entitled "Experiments to prove that Water is not incompreſſible" was alſo communicated to the Society. See Compreſsion. Theſe experiments, as they refuted the famous Florentine experiment, were carefully examined, and the concluſion deduced from them very cautiouſly received. They were repeated before a committee of the Society, who profeſſed themſelves ſatisfied with their accuracy and with the fact inferred from them; and in conſequence of their report, the council unanimouſly voted to Mr. Canton the gold medal, which was delivered to him on the 30th of November, 1765. In 1768 our author communicated to the Society, "An eaſy Method of making a phoſphorus, that will imbibe and emit Light, like the Bolognian ſtone, with Experiments and Obſervations." See PHOSPHORUS. Mr. Canton was one of the committee of the Royal Society, who, in 1769, took into conſideration the beſt and the moſt effectual method of fixing electrical conductors to preſerve the cathedral of St. Paul's from damage by lightning: and the mode which they recommended has been put into execution. Our author's laſt paper, addreſſed to the Royal Society, was read in December 1769, and contained "Eperiments to prove that the Luminouſneſs of the Sea ariſes from the Putrefaction of its animal Subſtances." Beſides the papers above recited, and which have been ſelected on account of their peculiar importance and utility, Mr. Canton wrote a number of others, which appeared in ſeveral different publications. The compiler of this article had the honour of intimate acquaintance with Mr. Canton for ſeveral of the laſt years of his life; and he can bear teſtimony from his own obſervation to the peculiar neatneſs and elegance of his apparatus, and to the accuracy and addreſs with which he conducted his experiments. He can alſo teſtify with gratitude and pleaſure to the urbanity of his manners, and to the readineſs with which he communicated information to all who wiſhed to receive, and who ſeemed diſpoſed to derive any advantage from it. His death, of a dropſy in the thorax, probably occaſioned by his ſedentary and ſtudious habits, at comparatively the early age of 54, in March 1772, was much regretted by all who knew him, not only as it deprived them of an eſteemed friend, but as his deceaſe was no inconſiderable loſs to the intereſts of ſcience, which he aſſiduouſly cultivated and improved. His wife, whom he married in 1744, and by whom he had ſeveral children, ſurvived him. His eldeſt ſon, Mr. William Canton, ſucceeded him in the academy. Biog. Brit.

CANTON, in *Geography*, a quarter of a city, conſidered as ſeparated and detached from the reſt.

The word ſeems formed from the Italian *cantone*, a *ſquare ſtone*, or *corner ſtone*.

CANTON is alſo more frequently uſed for a ſmall country, or diſtrict, under its ſeparate government. Such are the thirteen Swiſs *cantons*; each of which forms a republic apart; but all are leagued together, and conſtitute what is called the Helvetic body. See SWISSERLAND.

CANTON, in the late organization of the French conſtitution, denotes a ſubdiviſion of a diſtrict, as the diſtricts are ſubdiviſions of the departments. See DEPARTMENT. Each canton is compoſed of a certain number of communes (ſee COMMUNE); and is comprehended within the juriſdiction of a juſtice of peace. The "aſſembly of canton" is compoſed of all the citizens domiciliated within the canton, and who are inſcribed upon the communal liſt of the diſtrict. The firſt conſul nominates the preſident of this aſſembly, whoſe functions laſt five years; and he is aſſiſted by four ſcrutineers and a ſecretary. Each aſſembly of canton divides itſelf into ſections, for the purpoſe of performing the functions that belong to it; and it propoſes two citizens, from whom the firſt conſul chuſes the juſtice of the peace of the canton, and alſo two citizens for every vacant place of deputy. The juſtices of peace, and their deputies are appointed for ten years. In the cities conſiſting of 5000 perſons the aſſembly of canton preſents two citizens for each place in the municipal council; and in cities, where are ſeveral aſſemblies of canton, each aſſembly is empowered in like manner to preſent two citizens for the ſame purpoſe. The members of the municipal councils are taken by each aſſembly of canton from a liſt of 500 perſons of the firſt conſideration of the canton; and theſe councils ſhall be renewed, one half, every ten years. The firſt conſul chuſes the mayors and aſſiſtants in the ſaid councils, who are continued five years in office, but may be rechoſen. The aſſembly of canton nominates for the electoral college of diſtrict the number of members aſſigned to it, in proportion to the number of citizens of which it is compoſed; and it nominates to the electoral college of department, from a given liſt, the number of members aſſigned to it. The government convenes the aſſemblies of canton, and fixes the time of their duration, and the object of their meeting.

CANTON, or QUANG-CHOO-FOO, a city and maritime port of China, and capital of the province of Quang-tong or Canton. The city and the ſuburbs are ſituated for the moſt part on the eaſtern bank of the Pe-kiang river, which communicates by canals with the neighbouring provinces. The city is compoſed, as it were, of three different cities, ſeparated by lofty walls, but ſo connected, that the ſame gate ſerves to paſs from the one and to enter into the other. Theſe three cities united form a regular ſquare, and the city wall is ſaid to be about ſix or ſeven miles in circumference; though the incloſure is occupied partly by pleaſure-grounds and fiſh-ponds, as well as by private and public buildings. The ſuburbs are much more extenſive. The ſtreets are long and ſtraight, chiefly paved with flat ſtones, and ornamented at certain intervals with triumphal arches; ſome of them are covered, and theſe contain the richeſt ſhops. The houſes are generally low, conſiſting only of one ſtory, without windows to the ſtreet; but other buildings, inhabited by the moſt reſpectable merchants and mandarins, are lofty, ſpacious, and convenient. Some of theſe are fitted up in the Engliſh manner, with glaſs windows and fire-grates, the latter of which are found to be uſeful about the winter ſolſtice. A large garden with ponds and parterres ſurrounds the buildings. On one ſide of them is a temple; and on the other, a high edifice, the top of which commands a view of the river and ſhipping, as well as of the city and the country to a conſiderable diſtance. Perſons of condition are carried in chairs; and few females are ſeen in the ſtreets. Theſe, however, are continually crowded, eſpecially with perſons, who are all loaded, and moſt of whom have their heads, legs, and feet bare. There is no other convenience in this city for removing goods from one place to another but by means of porters. The quay on which the European factories are built, and which is very extenſive, is ſituated, without the walls of the city, on the left bank of the river, and diſplays by flags the colours of every nation. Theſe factories compoſe a long range of buildings, of one ſtory, with ſeveral yards. From behind, they form a ſtreet, crowded with ſhops, which are furniſhed with every kind of merchandize; and the ſtreet is cloſed at the two extremities by barriers, beyond which the Europeans are not to paſs. Formerly they went every where, except into the Tartar town, which is contiguous to the Chineſe town. The number of ſtrangers to be ſeen in the ſuburbs, while their ſhips are loading and unloading in the river, together with their various languages, dreſſes, and characteriſtic deportment, would give occaſion to doubt, if a judgment were to be formed from that part of the town, to what nation it belonged. The town of boats is a league above Canton. They are all in ſtrait rows, and form ſtreets. Each boat, being tolerably large and covered, affords an habitation to a whole family; who have alſo a ſmall boat to procure proviſions,

ſions, as well as to go on ſhore when occaſion requires. The number of inhabitants in the town and ſuburbs of Canton is eſtimated at a million and a half; and if we conſider the great extent of the city, the vaſt reſort of trading veſſels and boats, and the immenſe number of mechanics, tradeſmen, merchants, merchants' clerks, porters, watermen, fiſhermen, huſbandmen, and mariners, this eſtimate will not be thought extravagant. The garriſon is ſometimes compoſed of 20,000, at other times of 25,000, and even of 30,000 Tartars. The number of perſons, who are obliged to live on the water in boats, and who are prohibited by the expreſs regulation of the law from ſettling on ſhore, may amount to 300,000, including the women of the town, who are eſtimated at 40,000. Canton is not only one of the beſt and moſt conſiderable ports of China, but it is the only one which Europeans are permitted to frequent; it is alſo the rendezvous of a great proportion of Chineſe veſſels, trading to Cochinchina, Formoſa, Haynan, Siam, Malacca, Achem, Batavia, the Moluccas, Japan, &c. The great objects of import and export are principally carried on in this city by means of agents belonging to companies in Europe. Such have been, as ſir G. Staunton obſerves, (Embaſſy to China, vol. ii. p. 527.) the probity, punctuality, and credit of the Engliſh Eaſt India company in particular, and of their agents, in the eſtimation of the Chineſe merchants, that their goods are always taken, as to quantity and quality, for what they are declared in the invoice; and the bales with their mark paſs in trade, without examination, throughout the empire. Theſe agents are divided generally into ſuper-cargoes and writers; and they are allowed a commiſſion on the buſineſs which they do, according to their ſtations in the ſervice. The exports of Canton conſiſt of many articles, but that which is much the moſt conſiderable is tea; of which the Europeans and Americans received, in 1795, 5,577,200 lbs., and the Engliſh private trade amounted to 23,733,810 lbs. The exports from Canton to India amounted, in 1792, to 330,000l., leaving a vaſt balance in favour of India, which is paid in caſh. The articles purchaſed for India conſiſt chiefly of raw and wrought ſilk, ſugar and ſugar-candy, tutenag, alum, porcelain, camphor, nankeen cloth, quickſilver, and turmeric. In 1792, there were imported into Canton from England, in 16 company's ſhips, to the amount of near 1,000,000l. in lead, tin, woollens, together with furs, and other articles of private trade. The order for woollens only in the following year was 250,000l. higher than the preceding year. The legal trade from the Britiſh dependencies in India to Canton, in 1792, amounted to very near the ſum of 700,000l., beſide opium, which is clandeſtinely imported there, to the amount of about 250,000l. The articles legally imported conſiſted of cotton, tin, pepper, ſandal-wood, elephants' teeth, and bees' wax. The total imports from foreign European nations to Canton, in 1792, amounted to 200,000l.; and their exports to upwards of 600,000l. Many of the imports were of Britiſh manufacture. The Canton artiſts are uncommonly expert in the imitation of European works. They repair, and even make watches, copy paintings, and colour drawings, with great ſucceſs. They ſupply ſtrangers with coarſe ſilk ſtockings, knit or woven at Canton, though few or none of them are worn by the natives. The toys made at Canton, and known under the name of balancers and tumblers, are partly filled, and their equilibrium ſuſtained, by quickſilver. The lapidaries of Canton, who cut diamonds, uſe for that purpoſe adamantine ſpar. The amalgama of tin and quickſilver is applied, by the artiſts in Canton, in making ſmall mirrors, with glaſs blown upon the ſpot from broken pieces of that material imported whole from Europe. The ſpectacles uſed by the Chineſe are formed of cryſtal, which the Canton artiſts cut into laminæ, with a kind of ſteel ſaw, formed by twiſting two or more fine iron wires together, and tying them like a bow-ſtring to the extremities of a ſmall flexible bamboo. The ſiliceous powder of the cryſtal, procured by ſawing, is received into a trough of water; and with that mixture the wire and groove formed in the cryſtal are often moiſtened. The powder of the cryſtal, like that of the diamond, helps to cut and poliſh itſelf. Gold leaf is uſed by the ſilk or velvet weavers in their tiſſues and embroideries. Trinkets alſo are made of it at Canton, which, though not worn by the Chineſe, are ſold in Europe as eaſtern ornaments. Silver is alſo drawn into threads, like gold, to be uſed in the ſilk and cotton manufactures. For the method uſed at Canton in preparing their white copper or petung, &c.; ſee that article.

By the accurate obſervations of Mr. Raper, during the year 1774, cited by Kirwan in his "Eſtimate," &c. p. 97, the temperature of Canton was 75° 14'.; the ſtandard temperature 75° 4'.; the greateſt heat in January 66° 5'., the leaſt 51°; the greateſt heat in Auguſt 89°, and the leaſt 80°. N. lat. 23° 7' 50". E. long. 113° 2' 15".

Canton, a province of China, of which the above deſcribed city is the capital. See Quang-tong.

Canton, a townſhip of America, in Norfolk county, Maſſachuſetts, incorporated in 1797; being formerly the northern part of Stoughton.

Canton, in *Heraldry*, is one of the nine honourable ordinaries; being a ſquare portion of the eſcutcheon parted from the reſt.

It has not any fixed proportion; though regularly it ſhould be leſs than a quarter, it is often only a ninth part, and uſed as an addition, or difference, frequently to expreſs baſtardy. The canton is ſometimes placed at the right corner, and ſometimes at the left; in which latter caſe, it is called a *canton ſiniſter*. For its form, ſee *Plate, Heraldry*.

Canton is alſo uſed for the ſpaces left between the branches of a croſs or ſaltier.

*To* Canton, or diſpoſe of in cantonments, in French *cantonner*, in the *Military Art*, is to diſtribute troops in towns and villages as contiguous to one another and as nearly in the ſame line as poſſible, and in ſuch a manner as to command the avenues to the ſame, and to front the diſtrict of country the enemy is in, or the towns, villages, poſts, or poſitions, he may occupy or poſſeſs himſelf of. Troops are ſometimes cantoned after the fatigues of a ſiege, that has been undertaken early in the ſpring, that they may have ſome time to repoſe and recruit themſelves; ſometimes in the midſt of a fatiguing campaign, for the purpoſe of reſt and refreſhment; ſometimes towards the cloſe of a campaign, when forage is ſcanty and the weather intemperate, till ſuch time as the enemy ſhall go into winter quarters; and ſometimes before the opening of an early campaign for the ſake both of ſubſiſtence and of convenience to a proper or eligible camp of exerciſe, which is at all times within reach of their cantonments, and can be protected from them.

The cantoning of troops is alſo a phraſe occaſionally, though not very properly, made uſe of for the diſpoſing or diſtributing of troops into winter quarters. See the article Quarters.

In a garriſoned town or place, when there is not a ſufficiency of barracks and caſemats for the troops, different diſtricts of it are allotted to different regiments for the accommodation of their officers and men. And ſuch an allotment or diviſion of the town, is ſometimes called the cantoning of it.

CANTONE, in *Commerce*, a meaſure of three gallons, wine-meaſure, at Alicant.

CANTONED, a word uſed in *Architecture*, when the corner of a building is adorned with a pilaſter, an angular column, ruſtic quoins, or any thing that projects beyond the naked of the wall.

Cantoned, Cantone', or Cantonized, in *Heraldry*, is when the four cantons, or ſpaces round a croſs, or ſaltier, are filled up with any pieces.—He bears gules, a croſs argent, cantoned with four ſcallop ſhells.

The word is alſo uſed when there are little pieces in the cantons, or ſpaces, of any principal figure of an eſcutcheon. Thus the ſaltier of Lenox is cantoned with four roſes.

CANTONING, in *Middle Age Writers*, denotes the dividing a thing into hundreds, or ſelling it by hundred weights, or hundreds in tale.

CANTONMENTS, in *Military Art*, are a ſort of tranſient or temporary quarters for different purpoſes, but chiefly for the repoſe of troops. Cantonments differ from quarters in this reſpect, that the former are ſeldom made uſe of but for a ſhort reſt or refreſhment to an army that is much fatigued, but continues to do the ſame ſort of duty in them as in the field; whereas in the latter, duty is performed as in garriſoned places.

In quarters of cantonment, the troops ought to be arranged and diſpoſed of nearly in the ſame manner as in order of battle; viz. with the cavalry on the wings and the infantry in the centre. The cantonments ſhould not be very much ſcattered or extended. They ought not to exceed ten or twelve leagues in front, or be more than four or five in depth. Before you take the field, they ſhould be a little contracted, and then divided or diſpoſed of under the command of five or ſix of the oldeſt generals. One of theſe ſhould command the cavalry of the right wing, another that of the left, and the reſt the infantry in the centre. By ſuch a diviſion or diſpoſition, all orders from the commander in chief will be the more expeditiouſly executed, and the troops will with greater eaſe form their columns when they are going to take the field.

CANTOR, in *Entomology*, a ſpecies of Cerambyx, found in China. The thorax is unarmed, cinereous, with black dots: wing-caſes pale, teſtaceous; bidentated at the tip, and cinereous with black ſpots. *Fabricius*.—Obſ. This is of the middle ſize, and villoſe.

Cantor, *Lat.* a ſinger, a chanter. In the Lutheran church, the *cantor* is the coryphæus of the pſalmody. In moſt parts of Germany, where the proteſtant religion is eſtabliſhed, each pariſh has a cantor to teach ſinging, and to direct the chorus.

Though cantor is a general appellation for a ſinger, it is in a particular manner applied, in this country, to the perſon who has the direction of ſinging the pſalms and hymns in pariſh churches. He is precentor, or leader of the pſalm, which he likewiſe ends, by ſinging the laſt word of every line; ſo that he may be called the alpha and omega of ſacred ſong.

The cantor, who is likewiſe frequently ſchoolmaſter, beſides having a good voice, ſhould neceſſarily underſtand counterpoint; if not in a high degree, at leaſt ſufficiently to correct ſuch errors as may have crept into compoſitions, through the ignorance or careleſſneſs of tranſcribers. He ſhould likewiſe be able to make an accurate ſcore, and from the ſcore to figure the baſe, in ſuch a manner as to include all the accidents of modulation. "Without theſe qualifications," ſays M. Walther, in his Muſical Lexicon, "as a German organiſt is not gifted with univerſal knowledge, no perfect harmony can be hoped."

In the market towns and villages of Thuringia, in Saxony, where two perſons are uſually employed in a ſchool, he who directs the muſic in the choir, or leads the pſalm or chorus, is called rector or ſchoolmaſter, and the organiſt is commonly cantor.

CANTRED, or Cantref, denotes a diſtrict or diviſion of an hundred towns or villages. The word is Britiſh, compounded of *cant*, hundred, and *trev*, or *tref*, town or *village*.

Wales, with regard to its leſſer diviſions, ſeems to have been originally divided into "bóds," "trevs," and "caers." The "bôd" is ſuppoſed to have been the manſion-houſe of a chieftain on his firſt ſettlement in the country; the lands which he aſſigned for the maintenance of his dependants in the increaſing colony were called a "trev;" and the incloſure of ſuch lands for defence or convenience, formed either of wood or ſtone, might have been denominated a "caer." An aſſemblage of ſeveral "bóds," formed a "trev" or townſhip; and a hundred of theſe "trevs" conſtituted a "cantrev." For the more eaſy and regular diſpatch of buſineſs, a "cantrev" was divided into two or more "commots;" each of which conſiſting of a certain number of "bóds" and "trevs" formed a diſtinct precinct, and was conſidered as a lordſhip, poſſeſſing a ſeparate court and juriſdiction. Angleſey, in particular, was divided into three "cantrevs" or "cantreds," which are each ſubdivided into ſix "commots" or "commotes," each "commote" containing about ſixty "trevs" or townſhips. The general partition of Wales into "cantrevs" and "commots" is very ancient. Rowl. Monaſt. Ant. Eſſ. § x. p. 110, &c.

CANTU, in *Geography*, a town of Italy, in the Mileneſe; 5 miles S.S.E. of Como.

CANTUA, in *Botany*, (the Peruvian name) Lam. Enc. vol. 1. p. 603. Illuſt. 303. Wild. 324. Juſſ. 136. Vent. vol. ii. 401. Claſs and order, *pentandria monogynia*. Nat. ord. *Polemonia*, Juſſ. Gen. Ch. *Cal.* Perianth one-leafed, tubular, rather ſhort, permanent, five, ſometimes three-cleft; ſegments acutely egg-ſhaped, nearly equal. *Cor.* monopetalous, funnel-ſhaped; tube cylindrical, longer than the calyx; border nearly equal, erect, but a little ſpreading, five-lobed; lobes ſhort, obtuſe. *Stam.* Filaments five, equal, inſerted into the tube of the corolla; anthers egg-ſhaped, ſmall, verſatile. *Piſt.* Germ ſuperior, oblong-egg-ſhaped; Style thread-ſhaped, about the length of the ſtamens; ſtigma trifid. *Peric.* Capſule oblong-egg-ſhaped, cloathed at its baſe with the calyx, three-celled, three-valved, opening at the top: valves oppoſite to the partitions. *Seeds* numerous, egg-ſhaped, winged, affixed to a central, triangular receptacle.

Eſſ. Ch. Corolla monopetalous, funnel-ſhaped. Stamens with equal filaments. Capſules three-celled. Seeds winged. Nearly allied to Bignonia.

Sp. 1. C. *pyrifolia*, Lam. Ill. Pl. 105. *fig.* 1. "Flowers terminal; ſtamens longer than the corolla; leaves egg-ſhaped, petioled, entire, ſmooth." Willd. A ſhrub, ſmooth in all its parts. *Branches* woody, thick, ſtiff, marked with ſcattered tubercles or knots. *Leaves* an inch and a half long, and near an inch broad; alternate; petioles ſhort, proceeding from the tubercles. *Flowers* peduncled, in terminal racemes; calyx often three-cleft, and divided more deeply on one ſide. Found in Peru by Joſeph de Juſſieu. 2. C. *buxifolia*, Lam. Ill. pl. 106. *fig.* 2. "Flowers terminal; ſtamens ſhorter than the corolla; leaves oblong, nearly ſeſſile, entire, pubeſcent beneath." Willd. A ſhrub. *Branches* woody, rather cylindrical, pubeſcent towards their ſummit. *Leaves* ſmall, about ſix lines long, and little more than two broad, alternate or faſciculated, lanceolate-egg-ſhaped, entire. *Flowers* large, peduncled, upright; peduncles and calyx pubeſcent; corolla tubular, an inch and half long. Found in Peru by Joſeph de Juſſieu. 3. C. *Hoitzia*, Willd. (Hoitzia mexicana; Lam. Encyc. Juſſ.) "Flowers axillary; ſtamens longer than the corolla; leaves egg-ſhaped, ſeſſile, toothed." Willd. *Stem* a little ſhrubby; branches ſlender, cylindrical, pubeſcent, eſpecially near their ſummit. *Leaves* alternate, entire near their baſe, a little nerved underneath. *Flowers* of a fine red colour, ſolitary, nearly ſeſſile, on the upper part of the branches; ſegments of the calyx acute: bractes ſix, lanceolate, a little longer than the calyx, and ſurrounding it in the form of an exterior calyx, ſharply toothed, and terminated by a ſpinous point; tube of the corolla four or five times longer than the calyx, ſlightly curved. *Fruit* not known. A native of Mexico. Willdenow juſtly obſerves that as it differs from Cantua only in its bractes, it ought not to conſtitute a diſtinct genus. 4. C. *pinnatifida*, Lam. Ill. (c. coronopifolia, Willd. Polemonium rubrum, Linn. Sp. Pl. Ipomœa rubra, Syſt. veg. Quamoclit pinnatum erectum, Dill. Elth. tab. 241. *fig.* 312.) "Flowers terminal; ſtamens the length of the corolla; leaves pinnatifid." *Stem* ſomewhat ſhrubby, upright, not milky. Tube of the *calyx* ſhort; ſegment of its border awl-ſhaped, longer than the tube. *Stamens* inſerted into the middle of the tube of the corolla without valves. A native of ſandy ſoil in Carolina. Four other ſpecies are figured by Ruiz and Pavon in the Flora Peruvienſis, and three more by Cavanilles in his Icones Plantarum.

CANTWELL, Andrew, in *Biography*, born at Tipperary in Ireland, but lived principally in Paris, where he was made doctor in medicine in 1742. The ſame year he publiſhed a tranſlation into French of the account of Mrs. Stephens' medicine for diſſolving the ſtone in the bladder; and in 1746 an account of ſir Hans Sloane's medicines for diſeaſes of the eyes; alſo ſome ſevere ſtrictures on the practice of propagating the ſmall pox by inoculation; and in the Philoſophical Tranſactions, London, N° 453, an account of a double child, a boy. He died at Paris, July 11, 1764. Haller. Bib. Anat. Eloy Dict. Hiſt.

CANTY Bay, in *Geography*, ſometimes called New bay, lies on the coaſt of Java in the Eaſt Indies, and is formed by an iſland of the ſame name. It furniſhes the beſt accommodation for wooding and watering in theſe ſeas.

CANTYRE. See Kintyre.

CANVAS, or Canvass, in *Commerce*, a coarſe ſort of linen or hempen cloth, uſually woven open, and regularly, in little ſquares; ſerving for divers domeſtic purpoſes, and eſpecially for the ground of tapeſtry work and painting.

We have divers ſorts and denominations of canvas, moſt of them imported from abroad; as Dutch, Barras, and Heſſian canvas; packing canvas; guttings and ſpruce canvas; poledavies, ebbing, or Queenſbrough canvas; working canvas, for botts or cuſhions, narrow, broad, and broadeſt.

Canvas alſo is the cloth on which painters uſually draw their pictures; the canvas being ſmoothed over with a ſlick-ſtone, then ſized, and afterwards whited over, makes what the painters call their *primed cloth*, on which they draw their firſt ſketches with a coal or chalk, and afterwards finiſh with colours.

Canvas is alſo a name ſometimes given to ſail cloth.

Canvas-*bags*, in the *Military Art*, contain about a cubic foot of earth or ſand, with which they are filled. Their uſe is to raiſe a parapet in haſte, or to repair one when beaten down. See Sacks *of earth*.

Canvas is alſo uſed among the French, for the model or firſt words, whereon an air, or piece of muſic, is compoſed, and given to a poet to regulate and finiſh. The canvas of a ſong contains certain notes of the compoſer, which ſhew the poet the meaſure of the verſes he is to make. Thus Du Lot ſays, he has canvas for ten ſonnets againſt the Muſes.

CANUCCIS, in *Ancient Geography*, the ſtation of a Roman colony in Africa, planted there by Auguſtus, about 7 miles W. from Jol; the Gunugi of Ptolemy, and Gunagus of the Itinerary, and correſponding to the Breſk of the Algerines. See Bresk.

CANVEY, in *Geography*, a ſmall iſland in the mouth of the Thames, near the coaſt of Eſſex, about 5 miles long and 2 wide; high tides often overflow the loweſt parts of it: 5 miles N.W. from the Nore.

CANULA. See Cannula.

CANUS, in *Zoology*, a South American ſpecies of Coluber, diſtinguiſhed by having 188 abdominal plates, and 70 caudal ſcales. Linn. Muſ. ad. Fr.

This ſnake is deſcribed by Boddaert as being of a hoary colour, with large whitiſh ſpots diſpoſed ſerrately, with a ſnowy white ſpot between each. The ſnout is obtuſe and rounded; head imbricated with ſcales. It is conceived that this ſpecies ought to be conſidered as a connecting link between the two genera Boa and Coluber.

CANUSIUM. See Canosa.

CANUTE, ſurnamed "the Great," in *Biography*, king of Denmark and England, ſucceeded his father Sweyn in the firſt kingdom, about the year 1014; and commenced his reign with the invaſion of England and Norway, both which kingdoms had revolted from his father. England, however, was his principal object; and as the Engliſh had recalled Ethelred their king, who had abdicated the throne, he was not unapprehenſive that this event might lead to an attempt for rendering him independent of the crown of Denmark. Accordingly he prepared for an invaſion of the kingdom, and ſoon appeared with a fleet off the eaſtern coaſt, which he ravaged with mercileſs fury; putting aſhore all the Engliſh hoſtages at Sandwich, after having cut off their hands and noſes. His abſence, however, had afforded Olaus king of Norway an opportunity of invading his kingdom, and he was under a neceſſity of returning home in order to check his progreſs. This enterpriſe having been completely accompliſhed, he reſumed his attack on England, and made great depredations on the ſouthern coaſt, where an army was aſſembled againſt him, under the command of prince Edmund and duke Edric, the ſon-in-law of Ethelred, who was a notorious traitor. Edric ſtill continued his perfidious machinations; and after endeavouring in vain to get the prince into his power, he found means to diſperſe the army; and he then openly deſerted to Canute with 40 veſſels. When prince Edmund, called "Ironſide," ſucceeded his father Ethelred, he contended gallantly againſt Canute and his confederates; but after the loſs of two battles, occaſioned chiefly by the falſehood and treachery of Edric, he was obliged to acquieſce in a treaty, which divided the kingdom between him and Canute. The latter reſerved to himſelf the northern diviſion, conſiſting of Mercia, Eaſt Anglia, and Northumberland, which he had entirely ſubdued; and the ſouthern parts were reſerved for Edmund. This prince ſurvived the treaty about a month; and his murder, by the accomplices of Edric, made way for the ſucceſſion of Canute to the crown of England, A.D. 1017. Againſt his valour and activity and the ſtrong force which he commanded, the two ſons of Edmund could make but an ineffectual reſiſtance; however, Canute, before he ſeized the dominions of the young princes, ſummoned a general aſſembly of the ſtates in order to ſecure to himſelf the ſucceſſion of the kingdom. In order to maintain the unmoleſted poſſeſſion of the throne, he gratified ſome of the nobility with extenſive governments and juriſdiction, and others, on whoſe fidelity he could not rely, he put to death. Among the latter was the perfidious Edric. His Daniſh followers were liberally recompenſed by means of the heavy taxes which were laid on the people, and particularly on the inhabitants of London, who were thus retaliated for their affection to Edmund and their reſiſtance to the Daniſh power in two obſtinate ſieges. In one of theſe ſieges he diverted the courſe of the Thames, and thus by a new channel brought his ſhips above London-bridge. Canute, having by the concurrence of art and power eſtabliſhed himſelf upon the throne, determined, with the ſoundeſt policy, to reconcile his Engliſh ſubjects to the Daniſh yoke, by the juſtice and impartiality of his adminiſtration. Accordingly, he ſent back to Denmark as many of his followers as he could ſpare; he reſtored the Saxon cuſtoms in a general aſſembly of the ſtates; he made no diſtinction between the Danes and Engliſh in the diſtribution of juſtice; and he took care by a ſtrict execution of law, to protect the lives and property of all his people. In proceſs of time the Danes were gradually incorporated with his new ſubjects. For the greater ſecurity of his government he contrived to remove the two ſons of Edmund to Hungary; and, to conciliate the Normans, who eſpouſed the cauſe of Alfred and Edward, the ſons of Ethelred, he married Emma, the mother of theſe princes and the ſiſter of Richard, Duke of Normandy.

Canute, having ſettled his power in England beyond the danger of a revolution, made a voyage to Denmark, for the purpoſe of reſiſting the attacks of Oſmund, king of Sweden; and in this expedition he was accompanied by a great body of the Engliſh, under the command of the earl Godwin. The earl, by his ſkill and valour, contributed to the total diſcomfiture of the Swediſh army, and ſo effectually recommended himſelf to Canute, as not only to obtain his daughter in marriage, but to lay the foundation of that immenſe fortune which afterwards accrued to his family. Canute, availing himſelf of this advantage, paſſed with ſuch celerity to Schonen, that he ſurpriſed, defeated, and ſlew in battle the king of Sweden. In another voyage, which he made afterwards to Denmark, he attacked Norway, and expelling the juſt, but unwarlike Olaus, kept poſſeſſion of his kingdom till the death of that prince. Canute was now one of the moſt powerful ſovereigns in Europe; extending his empire over Denmark, Norway, and England, and having rendered Sweden tributary. But neither the elevation of his rank, nor the extent of his dominion, could bound the graſp of his capacious and aſpiring mind. Experience taught him the unſatisfactory nature of all terreſtrial enjoyments; and he began to direct his views towards that future exiſtence, which it is ſo natural for the human mind, whether ſatiated by proſperity or diſguſted with adverſity, to make the object of its attention. The ſpirit of the age in which he lived, however, gave a wrong direction to his devotion; and inſtead of making compenſation to thoſe whom he had injured by his former acts of violence, he employed himſelf entirely in thoſe exerciſes of piety, which the monks repreſented as the moſt meritorious. He built churches, endowed monaſteries, enriched eccleſiaſtics, and beſtowed revenues for the ſupport of chantries, in various places, where he appointed prayers to be ſaid for the ſouls of thoſe who had there fallen in battle againſt him. He even undertook a pilgrimage to Rome, where he reſided a conſiderable time, and where he obtained from the pope ſome privileges for the Engliſh ſchools erected in that capital, and exemptions from thoſe impoſitions and tolls which the Engliſh pilgrims had been accuſtomed to pay in the countries through which they paſſed. It is natural to imagine that a ſovereign, ſo proſperous and powerful, ſhould meet with adulation from his courtiers. A ſingular, but well known, inſtance of this kind occurs in the caſe of Canute. Some of his flatterers, when they were one day expreſſing their admiration of his grandeur and dominion, ſaid to him, that nothing was beyond the reach of his power: upon which the monarch, it is ſaid, ordered his chair to be ſet on the ſea-ſhore, while the tide was riſing; and as the waters approached, he commanded them to retire, and to obey the voice of him who was lord of the ocean. He feigned to ſit ſome time in expectation of their ſubmiſſion; but when the ſea ſtill advanced towards him, and began to waſh him with its billows, he turned to his courtiers, and remarked to them, that every creature in the univerſe was feeble and impotent, and that power reſided with one Being alone, in whoſe hands were all the elements of nature; who could ſay to the ocean, "Thus far ſhalt thou go, and no farther;" and who could level with his nod the moſt towering piles of human pride and ambition. The only memorable action which Canute performed, after his return from Rome, in 1031, was an expedition againſt Malcolm, king of Scotland, who had refuſed to render him homage for the county of Cumberland, which he held as vaſſal to the crown of England. Upon his appearing on the frontiers with a formidable army, Malcolm ſubmitted, and agreed, that his grandſon and heir, Duncan, whom he put in poſſeſſion of Cumberland, ſhould make the ſubmiſſions required, and that the heirs of Scotland ſhould always acknowledge themſelves vaſſals to England for that province. After this enterpriſe Canute paſſed four years in peace, and died at Shafteſbury, in 1035; leaving three ſons, Sweyn, Harold, and Hardicanute, and appointing, by his will, Harold ſucceſſor to the Engliſh crown. Mod. Un. Hiſt. vol. xxviii. p. 429. Hume's Hiſt. of England, vol. i. p. 145—154.

CANUTI Avis, in *Ornithology*, *tringa canutus*; our common knot is ſo called by ſome old writers.

CANUTUS, in *Ornithology*, a ſpecies of Tringa, known in this country by the name of *knot*. It is a native of various parts of Europe, and of America. The bill is ſmooth; legs inclining to aſh colour; primary quill feathers ſerrated; outermoſt tail-feathers white, and without ſpots. Fn. Suec. Brünnich, &c.

The bill of this bird is duſky aſh-colour; irides hazel; lores duſky; eye-brows and band on the wings white; body cinereous above, beneath white; lower wing-coverts tipt with white; chin and breaſt with minute ſpots; belly and vent with duſky lines.

Canutus, a ſpecies of Tringa, with ſmooth bill; legs inclining to aſh-colour; primary quill feathers ſerrated, exterior tail feathers white and without ſpots. Fn. Suec. Obſ. This is the knot of Engliſh writers, Canutus of Briſſon, and Canut of Buffon. Inhabits Europe and America. Length nine inches; fleſh excellent.

CANY, in *Geography*, a town of France, in the department of the Lower Seine, and chief place of a canton in the diſtrict of Yvetot; the place contains 1432, and the canton 12,157 inhabitants; the territory includes 127½ kiliometres, and 23 communes. The adjacent country produces great quantities of corn and flax. N. lat. 49° 48′. E. long. 0° 32′.

Cany *Fork*, a river of America, in the ſtate of Tenneſſee, which is ſhort and navigable, and runs N. W. into Cumberland river, W. of the Salt-lick and oppoſite Salt-lick creek, 50 miles in a ſtraight line from Naſhville.

CANYTIS, in *Ancient Geography*. See Catytis.

CANZONE, an Italian lyric poem in regular ſtanzas, for which Dante has given precepts and eſtabliſhed the laws. The *canzoni* of Petrarca, and the old poets ſeem to want variety of meaſure, and to be too long ever to have been intended for muſic.

CANZONETTA, is the diminutive of *canzone*, a ſhort lyric poem, and always intended for muſic.

CANZURI, a name given by ſome authors to a peculiar kind of camphor more eſteemed than any other ſort. Some have ſuppoſed it thus called from *Kanzur* or *Chanzur*, the name of a place where they ſuppoſe it to be produced, which ſeems the more probable opinion, though Scaliger rejects it. See Canderros.

CAO-CHAN, in *Geography*, a town of Aſia, in the kingdom of Corea; 30 miles E.S.E. of Hetſin.

CAO-CHAN-LI, a town of Aſia in Corea; 420 miles E. of Peking.

CAOINAN, the name given to the funeral ſong of the Iriſh. Mr. Beauford (Iriſh Tranſ. Vol. IV. p. 46, &c.) has preſented to the curious a ſpecimen of this ſong, with the words in Iriſh and Engliſh, ſet to muſical notes, with its full choruſes of ſighs and groans, and burden of ulla lulla lulla lā. He has alſo prefixed a brief account of the modes of lamentation, by howls, geſtures, and ceremonies, which have prevailed, and which ſtill, in a degree, prevail in Ireland. He ſuppoſes them to have been derived from the primæval inhabitants of Ireland, of Celtic race. Theſe, he ſays, were a timorous and unwarlike race, as their military weapons, and every veſtige of their cuſtoms and manners ſtrongly indicate: their religion alſo was ſpiritual and untainted with human blood. Such a religion and ſuch manners imply a ſuſceptibility of tender impreſſions, and feminine expreſſions of ſorrow. Accordingly, it has been affirmed of the Iriſh, that to cry was more natural to them than to any other nation, and at length the Iriſh cry became proverbial. Cambrenſis, in the 12th century, informs us, that the Iriſh then muſically expreſſed their grief, or applied the muſical art, in which they are ſaid to have excelled all others, to the orderly celebration of funeral obſequies, by dividing the mourners into two bodies, each alternately ſinging their part, and the whole, at times, joining in full chorus. This antiphonal ſinging is ſaid to have been coeval with Chriſtianity in this iſle. See Antiphony. It was then the funeral elegy roſe in poetic numbers, and was ſung in poetic accents to the ſound of muſical inſtruments. After the body of the deceaſed, dreſſed in grave cloths, and ornamented with flowers, was placed on a bier, or ſome elevated ſpot, the relatives and "Keeners" ranged themſelves in two diviſions, one at the head and the other at the feet of the corpſe. The funeral caoinan having been previouſly prepared by the bards and "croteries," the chief bard of the head chorus began, by ſinging the firſt ſtanza in a low doleful tone, which was ſoftly accompanied by the harp: at the concluſion, the foot ſemi-chorus began the lamentation of "ullaloo," from the final note of the preceding ſtanza, in which they were anſwered by the head ſemi-chorus; theſe both united in one general chorus. The chorus of the firſt ſtanza being ended, the chief bard of the foot ſemi-chorus ſung the ſecond ſtanza, the ſtrain of which was taken from the concluding note of the preceding chorus; which ended, the head ſemi-chorus began the ſecond "gol" or lamentation, in which they were anſwered by that of the foot, and then, as before, they united in the general full chorus. Theſe alternately were the ſong and choruſes performed during the night: the genealogy, rank, poſſeſſions, virtues, and vices of the dead were rehearſed; and various interrogations were addreſſed to the deceaſed. Each verſicle of the Caoinan, it is ſaid, conſiſted only of four feet, and each foot was commonly of two ſyllables; the three firſt required no correſpondence, but the fourth was to correſpond with the terminations of the other verſicles. This kind of artificial metre was much cultivated by the Iriſh bards; but, on the decline of that order, the caoinan was aſſumed by women, and became an extemporaneous performance. Each province was ſuppoſed to have different caoinans, and hence the Munſter cry, the Ulſter cry, &c. which are only different imitations of the different choruſſes of the ſame caoinan, independent of provincial diſtictions. As the caoinan was ſung extempore, and had no genuine eſtabliſhed time, each ſet of "Keeners" varied the melody according to their taſte and muſical abilities, carefully preſerving, however, the ſubject or burden of the ſong throughout, both in the vocal and inſtrumental part; as begun by the leading "Keener." The caoinan is at preſent much neglected; and this ancient cuſtom will probably ſoon ceaſe; Engliſh manners and the Engliſh language ſupplanting that of the aboriginal natives. At the concluſion of the "Keenan," the body was conveyed to the place of interment, attended by the friends and relatives of the deceaſed, and accompanied by the cries of women, who at certain intervals ſung the "gol" or "ullaloo." In ancient times, after the interment, the favourite bards of the family, ſeated on the grave or ſepulchre, performed the "connthal" or elegy; which they repeated every new and full moon, for the firſt three months, and afterwards generally once every year, for perſons of diſtinction. The elegy was more regular than the "keenan," both in reſpect to its poetical compoſition and concluding cadence. The families, both in Wales and Ireland, retained this cuſtom to the cloſe of the laſt century, and it is frequently alluded to in the Iriſh ballads and poetical romances.

CAO-LIM, in *Geography*, a town of Aſia in Corea; 600 miles E.N.E. of Peking. N. lat. 42° 40′. E. long. 129° 29′.—Alſo, a town of Chineſe Tartary. N. lat. 42°. E. long. 123° 54′.

CAO-MING, a town of China, of the ſecond rank, in the province of Yunan. N. lat. 25° 22′. E. long. 102° 44′.

CAO-TANG, a town of China, of the ſecond rank, in the province of Chantong; 200 miles S. of Peking. N. lat. 36° 58′. E. long. 115° 54′.

CAO-TCHIN, a town of China, of the third rank, in the province of Pet-cheli; 15 miles E.S.E. from Tching-ting.

CAO-Y, a town of China, of the third rank, in the province of Pet-cheli; 30 miles S. of Tching.

CAO-YAM, a town of China, of the third rank, in the province of Pet-cheli; 12 miles S. of Gan.

CAO-YANG, a town of Aſia, in the kingdom of Corea; 7 miles N.W. of King-kitaſo.

CAO-YUEN, a town of China, of the third rank, in the province of Chang-tong; 42 miles N.W. of Tchintcheou.

CAORLO, a town of Italy, on an iſland of the ſame name, in the gulf of Venice, near the coaſt of Friuli; the ſee of a biſhop, ſuffragan of Venice. N. lat. 45° 54′. E. long. 12° 44′.

CAOUANNA, in *Zoology*, *Caouanne* of Ray; *teſtudo caretta* of modern naturaliſts, and logger-head turtle of Cateſby. The fleſh of this ſpecies is highly rancid, harſh, tough, and ſtringy. See Testudo Caretta.

CAOUKE, in the *Turkiſh Dreſs*, a high ſtiff turban, worn by the odabaſhees, or heads of the chambers of janizaries, when they go in proceſſion.

CAOUTCHOUC, *Elaſtic Gum*, in *Chemiſtry*. This ſingular vegetable ſubſtance was firſt brought to Europe from South America, about the beginning of the laſt century. Nothing however was known concerning its natural hiſtory till a memoir was preſented in 1736 to the French academy by Condamine, in which it is ſtated, that there grows in the province of Eſmeraldas in Braſil, a tree called by the natives "Hhevé, from the bark of which, when wounded, there flows a milky juice, which by expoſure to the air, is converted into caoutchouc. Some time after, the ſame tree was found in Cayenne by M. Freneau ; and it appears from later reſearches, that this ſingularly elaſtic ſubſtance is procured from at leaſt two trees natives of South America : of theſe, the one is called by botaniſts hævea caoutchouc, and the other, jatropha elaſtica. The American caoutchouc is uſually brought to Europe in the form of globular narrow necked bottles, about a fourth of an inch thick, and capable of holding from half a pint to a quart or more. They are formed upon moulds of unburnt clay, pieces of which are often found adhering to the inſide. In its native country it is fabricated by the inhabitants into veſſels for containing water and other liquids, and on account of its inflammability, it is uſed at Cayenne for torches.

In the Aſiatic reſearches is an account by Mr. Howiſon, ſurgeon at Pulo Penang, of a ſubſtance exhibiting all the properties of caoutchouc, procured from the juice of a climbing plant, the urceola elaſtica, a native of that ſmall iſland, and the neighbouring coaſt of Sumatra. If one of the thicker and older ſtems of this plant is cut into, a white juice oozes out, of the conſiſtence of cream, and ſlightly pungent to the taſte. By expoſure for a ſhort time to the action of the air, or ſtill more expeditiouſly by the addition of a few drops of acid, a decompoſition takes place ; the homogeneous thick cream-like juice, ſeparates into a thin whitiſh liquor, reſembling whey, and the caoutchouc concretes into a clot or curd, covered ſuperficially with a thin coating of a butyraceous ſubſtance. If the juice as ſoon as ſecreted is carefully excluded from the air, it may be preſerved for ſome weeks without any material change, but at length the caoutchouc ſeparates from the watery part in the ſame manner, though not ſo perfectly as it does by free expoſure to the air. The proportion of caoutchouc contained in the juice by the oldeſt ſtems, is nearly equal to two thirds of its weight ; the juice from the younger trees is much more fluid, and contains a conſiderably ſmaller proportion of this ſubſtance.

According to the experiments of Mr. Howiſon, cloth of all kinds may be made impenetrable to water by impregnating it with the freſh juice of the urceola ; and the pieces thus prepared are moſt effectually and expeditiouſly joined together by moiſtening the edges with the entire juice, or even the more watery part, and then bringing them in contact with each other. Boots, gloves, &c. made of this impervious cloth are preferable even to thoſe formed of pure caoutchouc, as they are more durable and retain their ſhape better. If a ſufficient quantity of this juice could be obtained, it might no doubt be applied to a vaſt variety of important purpoſes.

The colour of freſh caoutchouc is yellowiſh white, but by expoſure to the air it becomes of a ſmoak grey. American caoutchouc, in the ſtate in which it is brought to Europe, being formed of a multitude of extremely thin layers, each of which is expoſed to the air for ſome time in order to dry before the next is laid on, is of a yellowiſh ſmoak-grey colour throughout, but maſſes of Eaſt Indian caoutchouc being formed more expeditiouſly, are dark-coloured only on the outſide ; when cut into, they are of a very light brown, which however ſoon deepens by the action of the air. Caoutchouc is perfectly taſteleſs, and has little or no ſmell, except when it is warmed ; it then gives out a faint peculiar odour. The elaſticity of this ſubſtance is very remarkable, and indeed is one of its moſt characteriſtic properties. Slips of caoutchouc when ſoftened by immerſion for a few minutes in boiling water, may be drawn out to ſeven or eight times their original length, and will afterwards reſume very nearly their former dimenſions. During its extenſion, a very ſenſible warmth is produced, as may be perceived if the piece is held between the lips ; and on the contrary, when it is allowed to contract, a decreaſe of temperature will immediately take place. By ſucceſſive extenſions and contractions, eſpecially in cold water, its elaſticity is much impaired ; but if in this ſtate it is immerſed for a time in hot water, it reabſorbs the caloric which it had loſt, returns to its original ſize, and recovers its primitive elaſticity. At the temperature of about 40° Fah. caoutchouc begins to grow rigid, its colour becomes much lighter, and it is nearly opaque, and as the cold increaſes, it becomes ſtill more ſtiff and harder. Theſe changes, however, depend merely on temperature, for a piece of hard frozen caoutchouc again reſumes its elaſticity on being warmed. The freſh cut ſurfaces of this ſubſtance will unite together by ſimple contact, and by a proper degree of preſſure, may be brought ſo completely in union as to be no more liable to ſeparate in this part than in any other. Its ſp. gr. according to Briſſon is 0.933. It undergoes no alteration by the action of the air at the common temperature. When boiled for a long time in water it communicates to this fluid a peculiar ſmell and flavour, and is ſo far ſoftened by it, that two pieces thus treated, and afterwards ſtrongly preſſed, will form a permanent adheſion to each other.

When heated to a temperature nearly equal to that of melting lead, caoutchouc runs into a black viſcid fluid of the conſiſtence of tar, which does not concrete on cooling, neither does it dry by long expoſure to the air. When held to a candle it readily takes fire, and burns with a copious white flame, and a large quantity of dark coloured ſmoak, exhaling at the ſame time a peculiar, but not unpleaſant odour : from its ſmoak a conſiderable quantity of very fine lamp-black may be collected. In dry diſtillation it gives out ammonia and carbonated hydrogen.

Concentrated ſulphuric acid, when heated, acts with great energy on caoutchouc, reducing it to a black friable carbonaceous ſubſtance, the acid at the ſame time being in part decompoſed, and ſulphureous acid being produced. When treated with nitric acid, azotic gas and carbonic and pruſſic acid are diſengaged, oxalic acid is left in ſolution, and the reſidue is converted into a yellow friable maſs. By digeſtion in oxymuriatic acid the colour of caoutchouc is diſcharged, it becomes opaque, indurated, and wrinkled, like tanned leather, but appears to undergo no other change. Similar effects are produced, though more ſlowly, by muriatic acid.

Ammoniacal gas, according to Dr. Thomſon, is abſorbed by caoutchouc, and converts it into a ſoft, glutinous, and inelaſtic ſubſtance. The ſame able chemiſt alſo ſtates, that the cauſtic fixed alkalies are capable of combining with, and diſſolving it. Caoutchouc is alſo ſoluble with eaſe at a boiling heat in the expreſſed vegetable oils, in wax, butter, and animal oils, forming viſcid inelaſtic compounds. Alcohol appears not to have the ſmalleſt action on it either cold or hot.

Rectified oil of turpentine, at the common temperature, acts without difficulty on caoutchouc, firſt rendering it tranſparent, and enlarging its bulk conſiderably, and in the courſe of a few days, effecting a complete ſolution. This compound is of the conſiſtence of drying oil, and when ſpread thin on wood, it forms a varniſh which however is a long time in becoming quite dry. When mixed with a ſolution of wax in boiled linſeed oil, it compoſes an elaſtic varniſh which is uſed for covering balloons.

The only menſtrua for this ſubſtance, from which it can be ſeparated again unaltered, are ether, naphtha, and cajeput oil.

The ſolubility of caoutchouc in ether was firſt diſcovered by Macquer, a circumſtance which from its frequent failure in the hands of other chemiſts, was very generally called in queſtion, till Cavallo cleared up the difficulty by ſhowing the neceſſity of employing waſhed ether for this purpoſe. If rectified ſulphuric ether is ſhaken in a vial with ſome pure water, it diſſolves about a tenth of its weight of this latter ſubſtance, and in this ſtate is capable of effecting a complete and ſpeedy ſolution of caoutchouc. The ſolution is of a light brown colour, and when ſaturated, is conſiderably viſcid. A drop of it let fall into a cup of water immediately extends itſelf over the whole ſurface; and the ether being partly abſorbed by the water, and partly evaporated, the water is found covered with an extremely thin film of caoutchouc, poſſeſſing its elaſticity, and all its other characteriſtic properties. A ſimilar effect takes place when cloth of any kind is ſoaked in the ſolution, or any hard ſurface is ſmeared over with it; on expoſure to the air the ether is rapidly evaporated, and the caoutchouc which it was combined with is left behind. The affinity of this ſolution for caoutchouc is very great: if the edges of two pieces of caoutchouc are dipped in it and immediately brought in cloſe contact with each other, as ſoon as the ether is evaporated, they will be found to be perfectly united.

There are two circumſtances which muſt always prevent the extenſive uſe of the ethereous ſolution of caoutchouc, admirably qualified as it is in other reſpects for many uſeful purpoſes; theſe are, firſt, its expenſiveneſs, and ſecondly, the extraordinary rapidity with which the ether evaporates; thus rendering it impoſſible to lay an even coating of this varniſh on any ſurface, and clogging up the bruſhes by which it is applied. In order to form tubes or catheters of this ſubſtance, the beſt method is to cut a bottle of caoutchouc in a long ſingle ſlip, and ſoak it for half an hour or an hour in ether: by this means it will become ſoft and tenacious, and if wound dexterouſly on a greaſed mould, bringing the edges in contact with each other at every turn, and giving the whole a moderate and equal preſſure by binding it with a tape wound in the ſame direction as the caoutchouc, a very effectual union will be produced; after a day or two, the tape may be taken off and the cylinder of caoutchouc may be rendered ſtill more perfect by pouring a little of the etherous ſolution into a glaſs tube cloſed at one end, the diameter of which is a little larger than that of the cylinder of caoutchouc; which being introduced into the tube, will force the ſolution to the top of the veſſel. Let the whole of the apparatus be then placed in boiling water; the ether will be evaporated, and a ſmooth and uniform coating of newly depoſited caoutchouc will remain upon the cylinder.

Petroleum when rectified by gentle diſtillation, affords a colourleſs liquid not to be diſtinguiſhed from the pureſt naphtha, and this, according to Fabbroni, has the property of diſſolving one ſeventieth of its weight of caoutchouc, and of depoſiting it again unaltered by ſpontaneous evaporation. It does not appear, however, that this menſtruum has been much employed.

The ſolubility of caoutchouc in cajeput oil was firſt noticed by Dr. Roxburgh. This is an eſſential oil procured in India, by diſtillation, from the leaves of the *Melaleuca Leucadendron.* The ſolution is very thick and glutinous; and is decompoſable by alcohol, this latter uniting with the eſſential oil and leaving the caoutchouc floating on the liquor in a ſoft ſemifluid ſtate. This on being waſhed with alcohol, and expoſed to the air, becomes as firm and elaſtic as before it was diſſolved; while in the intermediate ſtate between fluid and firm, it may be drawn out into long tranſparent threads, reſembling in the poliſh of their ſurface, the fibres of the tendons of animals, and ſo extremely elaſtic, that when broken, each end immediately returns to its reſpective maſs. Through all theſe ſtages the leaſt preſſure with the finger and thumb is capable of uniting different portions as completely as if they had never been ſeparated, and that without any clammineſs or ſticking to the fingers.

The uſes to which caoutchouc has been hitherto applied, are the following. It is chiefly uſed for rubbing out black lead-pencil marks from paper, whence its vulgar name Indian rubber: it is of value to the chemiſt as a material for flexible tubes to gazometers and other apparatus; the ſurgeon is indebted to it for flexible ſyringes and catheters; and finally it enters as an eſſential ingredient into the compoſition of the beſt varniſh for balloons.

Caoutchouc *Vine*, in *Botany*, a ſpecies of *Urceola*, which ſee.

CAP, a garment ſerving to cover the head, and made nearly of its figure.

The æra of caps and hats is referred to the year 1449, the firſt ſeen in theſe parts of the world being at the entry of Charles VII. into Rouen; from that time they began, by little and little, to take place of the hoods or chaperoons, that had been uſed till that period. M. le Gendre, indeed, goes farther back; they began, ſays he, under Charles V. to let fall the angles of the hood upon the ſhoulders, and to cover the head with a cap, or bonnet: when this cap was of velvet, they called it *mortier:* when of wool, ſimply *bonnet:* the firſt was laced, the latter had no ornament, beſides two horns, raiſed to a moderate height, one of which ſerved in covering and uncovering. None but kings, princes, and knights, were allowed the uſe of the *mortier*.

The cap was the head-dreſs of the clergy and graduates. Paſquier ſays, that it was anciently a part of the hood worn by the people of the robe; the ſkirts whereof being cut off, as an incumbrance, left the round cap an eaſy commodious cover for the head; which round cap being afterwards aſſumed by the people, thoſe of the gown changed it for a ſquare one, firſt invented by a Frenchman, called Patrouillet: he adds, that the giving of the cap to the ſtudents in the univerſities, was to denote, that they had acquired full liberty, and were no longer ſubject to the rod of their ſuperiors; in imitation of the ancient Romans, who gave a *pileus*, or cap, to their ſlaves, in the ceremony of making them free: whence the proverb, *Vocare ſervos ad pileum.* Hence alſo on medals, the cap is the ſymbol of liberty, whom they repreſent holding a cap in her right hand, by the point. When this cap was expoſed to the view of the people, on the top of a ſpear, as in the caſe of the conſpiracy which had occaſioned the death of Cæſar, it was intended as a public invitation to the people, to embrace the liberty that was offered to them by the deſtruction of their tyrant. This thought of the conſpirators on occaſion of this event, was not new; for Saturninus, in his ſedition, when he had poſſeſſed himſelf of the Capitol, exalted a cap on the top of a ſpear, as a token of liberty to all the ſlaves, who would join with him; and though Marius, in his ſixth conſulſhip, deſtroyed him for that act, by a decree of the ſenate, yet he himſelf uſed the ſame expedient afterwards to invite the ſlaves to take arms with him againſt Sylla, who was marching with his army into the city to attack him. Val. Max. viii. 6.

The Romans were many ages without any regular covering for the head: when either the rain or ſun was troubleſome, the lappet of the gown was thrown over the head; and hence it is that all the ancient ſtatues appear bareheaded, excepting ſometimes a wreath, or the like. And the ſame uſage obtained among the Greeks, where, at leaſt during the heroic age, no caps were known. The ſorts of caps or covers of the head in uſe among the Romans on divers occaſions, where the *pitra*, *pileus*, *cucullus*, *galerus*, and *palliolum*, the differences between which are often confounded by ancient as well as modern writers.

The French clergy wear a ſhallow kind of cap, called Calotte, which only covers the top of the head, made of leather, ſattin, worſted, or other ſtuff. The red cap is a mark of dignity allowed only to thoſe who are raiſed to the cardinalate. The ſecular clergy are diſtinguiſhed by black leathern caps, the regulars by knit and worſted ones.

The Chineſe have not the uſe of the hat, like us; but wear a cap of a peculiar ſtructure, which the laws of civility will not allow them to put off: it is different for the different ſeaſons of the year; that uſed in ſummer, is in form of a cone, ending at top in a point. It is made of a very beautiful kind of mat, much valued in that country, and lined with ſattin: to this is added, at top, a large lock of red ſilk, which falls all round as low as the bottom; ſo that, in walking, the ſilk fluctuating regularly on all ſides, makes a graceful appearance: ſometimes, inſtead of ſilk, they uſe a kind of bright red hair, the luſtre whereof no weather effaces. In winter they wear a pluſh cap, bordered with martlet's, or fox's ſkin; as to the reſt, like thoſe for the ſummer. Nothing can be neater than theſe caps; they are frequently ſold for eight or ten crowns; but they are ſo ſhort that the ears are expoſed.

The cap or bonnet is a mark or ornament of certain characters: thus churchmen, and the members of univerſities, ſtudents in law, phyſic, &c. as well as graduates, wear "ſquare caps." In moſt univerſities, doctors are diſtinguiſhed by peculiar caps, given them in aſſuming the doctorate. Wickliffe calls the canons of his time *biſurcati*, from their caps. Paſquier obſerves, that in his time, the caps worn by the churchmen, &c. were called "ſquare caps," though, in effect, they were round yellow caps.

The cap is ſometimes alſo uſed as a mark of infamy: in Italy the Jews are diſtinguiſhed by a yellow cap; at Lucca by an orange one. In France, thoſe who had been bankrupts were obliged ever after to wear a green cap, to prevent people from being impoſed on in any future commerce. By ſeveral arrets in 1584, 1622, 1628, 1688, it was decreed, that if they were at any time found without their green cap, their protection ſhould be null, and their creditors impowered to caſt them into priſon: but the practice is not now continued.

Cap *of maintenance*, or *Cap of ſtate*, one of the regalia or ornaments of ſtate belonging to the kings of England, before whom it was carried at the coronation and other great ſolemnities; and alſo of the mayors of ſeveral cities in England. It is of crimſon velvet faced up ermine, with two points turned to the back; and was formerly eſteemed a badge and ſymbol of dignity, and ſuitable to a prince of the blood, being worn by king Edward III. and ſucceeding kings of England down to Edward VI.; but of late it hath been granted to private families. It is frequently to be met with above the helmet, inſtead of a wreath, under gentlemen's creſts.

Cap *of a gun*, is a piece of lead which is put over the touch-hole of a gun, to keep the priming from being waſted or ſpilt.

Cap, in a *ſhip*, is a ſquare piece of timber, put over the head, or upper end of a maſt, having a round hole to receive the maſt. By theſe caps, the top-maſts, and top-gallant-maſts, are kept ſteady and firm in the treſſel-trees, where their feet ſtand; as thoſe of the lower-maſts do in their ſteps. Or, a cap is a thick block of elm-timber, with two holes perpendicularly to its length and breadth, and parallel to its thickneſs, (the foremoſt hole being round, and the after one ſquare), uſed to confine two maſts together, when one is erected at the head of the other to lengthen it. The main and foremaſt caps of large ſhips are of elm, and made of two pieces coaked or douled together in the middle; and others are of one ſolid piece. The main cap, in length, is to be four times the diameter of the top-maſt, with the addition of three inches; the breadth is to be twice the diameter, with the addition of two inches; and the depth four-ninths of the breadth. The fore-cap, in length, is to be four times the diameter of its top-maſt, with the addition of two inches; the breadth twice the diameter, with the addition of one inch; and the depth four-ninths of the breadth. The length of the mizen cap is to be four times the diameter of its top-maſt, with the addition of one inch; the breadth, twice the diameter; and the depth four-ninths of the breadth. The caps of yachts and ſimilar veſſels have a ſheave-hole on each ſide for the jeers of the lower yards. If the cap is made of two pieces, the thickneſs of the coak is added to one piece. When the coak is adjuſted, the two pieces are bolted through with ſix bolts, one inch diameter, two at each end, and two in the middle, which are driven from each ſide alternately and clenched on a ring. The holes are ſet off from the centre of the under-ſide of the cap at equal diſtances, and the diſtance between the holes is to be two-fifths of the diameter of the round hole, and half the tapering of the maſt head in its length. The round holes of all caps are leathered and nailed on the upper and lower ſides. In order to allow for the ſhrinking of the caps, the ſize of the tenon is taken $1\frac{1}{2}$ inch above the ſtops, and that is ſet off on the under ſide of the cap; the caps are alſo to be raiſed above a level from the middle-line on the maſt $\frac{1}{4}$ of an inch to a foot in length, in order to allow for their drooping. See Mast, and *Plate of* Ships.

Cap, is alſo a ſemicircular projection from the ſides and round the end of a block, above the pin; through which two holes are bored, obliquely from the ſides, meeting and forming an angle at the end; through theſe holes the ſtrap is paſſed, to prevent its being chafed. See Block.

*To* Cap, is ſaid of a ſhip in the trials of the running or ſetting of currents.

*To* Cap *a rope*, is to cover the end with tarred canvas, which is whipt with twine or ſpun yarn.

Cap, in *Chemiſtry*, ſignifies the piece which terminates the top of a *melting* furnace.

Cap, in *Geography*. See Button *iſland*.

Cap, in *Phytology*, a name given to the huſk or green ſucculent coat which covers the upper part of a nut, and connects it with the parent tree. The cap conſiſts of a pilling and parenchyma derived from the bark, and ramulets from the ligneous body of the branch.

Cap *of a* mushroom, is the head or ſuperior part expanded over the foot ſtalk, ſomewhat in manner of a canopy, or umbrella.

Cap, or *great* Cap, in *Surgery*, a denomination of a kind of compendious bandage, ſerving for almoſt all occaſions of the head, being in figure not unlike a helmet. Among chirurgical inſtruments we met with a ſilver *cap*, *pileolus argenteus*, (though of late alſo made of wood, or even white wax), perforated at both ends, applied to the paps of nurſing women, when ulcerated, for the more commodious giving of ſuck.

Cap, *black*, in *Ornithology*, the pewit, tringa vanellus.

Cap, *black*, alſo the motacilla atricapilla.

Cap, *Neptune's*. See Neptune.

Cap, *prieſt's*, in *Fortification*. See Bonnet *à prêtre*.

Cap-*merchant*, in a trading ſhip, is the ſame officer who is called purſer on board a man of war. The French call him writer (*ecrivain*). He is appointed by the merchant to whom the ſhip belongs, to take care that nothing be embezzled or ſquandered away.

CAPACINI, in *Geography*, a town of Naples, in the province of Capitanata; four miles weſt of Vieſta.

CAPACIO, a town of Naples, in the province of Principato Citra, the ſee of a biſhop, ſuffragan of Salerno; five miles north of Agropoli.

CAPACITY, in a general ſenſe, an aptitude or diſpoſition to retain or hold any thing.

Capacity, in *Geometry*, denotes the ſolid content of any body; and "meaſures of capacity" are our hollow meaſures for wine, beer, corn, ſalt, &c.

Capacity, in *Law*, ſignifies the ability poſſeſſed by an individual, or body politic, to give or take lands, or other things, or to ſue actions. Our law allows the king two capacities, a natural and a political: in the firſt he may purchaſe land to him and his heirs; in the latter, to him and his ſucceſſors. An alien born hath ſufficient capacity to ſue in any perſonal action, and is capable of perſonal eſtate; but he is not capable of lands of inheritance. See **Alien.** Perſons attainted of treaſon or felony, ideots, lunatics, infants, &c. are not capable of making any deed of gift, grant, or conveyance, unleſs in ſome ſpecial caſes. Co. Litt. 171, 172. See Infant, Ideot, &c. All perſons are capable of committing crimes and ſuffering puniſhment, on behalf of whom the want or defect of will cannot be legally pleaded. There are three caſes in which the will does not join with the act, viz. where there is a defect of underſtanding; where there are underſtanding and will ſufficient, but not called forth and exerted by the party poſſeſſing them at the time of the action done, as in the caſe of all offences committed by chance or ignorance; and where the action is conſtrained by ſome outward force or violence. Beſide the caſes comprehended under theſe particulars, there is one more in which the law ſuppoſes an incapacity of doing wrong, from the excellence and perfection of the perſon: this is the caſe of the king, who, by virtue of his royal prerogative, is not under the coercive power of the law; which will not ſuppoſe him capable of committing a folly, much leſs a crime. Blackſt. Com. b. iv. c. 2.

Capacity, in the *Modern Doctrine of Heat*, ſignifies the proportional capability of a given quantity of any ſubſtance to abſorb and retain caloric; or that diſpoſition or property by which various bodies reſpectively require more or leſs of this fluid to ſuperinduce any given temperature in a given maſs. See Caloric and Temperature.

That this capacity varies in different bodies, and even in the ſame ſubſtance in different ſtates, may be eaſily ſhewn. If the quantities of heat neceſſary to be added to or taken from bodies, in order to produce equal changes in their temperature, were in all caſes proportional to their reſpective quantities of matter;—as if, for example, it would require the ſame quantity of this fluid to heat a pound of water, a pound of oil, or a pound of mercury twenty degrees; this would, of courſe, indicate that their capacities were equal: but if, on the contrary, it ſhould be found that the ſame quantity of caloric applied to theſe various ſubſtances ſhould produce different changes in the temperature of equal quantities, or equal changes in the temperature of different quantities of each, it would follow that their capacities for this fluid muſt proportionally vary. Let us conceive that having three ſeveral pounds of water at the temperature of 110° of Fahrenheit's thermometer in ſeparate veſſels, there be added to the firſt a quantity of water at 50°, to the ſecond a quantity of ſpermaceti oil alſo at 50°, and to the third a quantity of mercury at the like temperature of 50°; and that each of the mixtures be ſtirred together, and the addition continued, till they have all aſſumed throughout a common temperature of 70°. Now, as each of the pounds of water has, in this caſe, been deprived of an equal quantity of caloric, (viz. as much as was neceſſary to raiſe its temperature 40°, or from 70° to 110°,) the *abſolute* capacities of the whole of the water, the oil, and the mercury, which have been added, muſt of courſe be equal, whatever be the quantity of each; each of them having abſorbed an equal quantity of heat. On comparing the quantities of theſe latter ſubſtances, however, it will be found that we have employed in the experiment about 2 pounds of water at 50°, 4 pounds of oil, and near 60 pounds of mercury, each of which has been heated 20°; ſo that it requires as much caloric to heat one pound of water 20° as to produce the ſame effect on two of oil, or thirty of mercury; and their *relative* capacities are therefore inverſely in this proportion.

Nor is it only among ſubſtances which eſſentially differ in their nature that this difference is found: the ſame body in different ſtates of exiſtence preſents us with equal varieties in its capacity. A change in this reſpect is producible in three ways: by mechanical compreſſion or dilatation, by chemical combination, or by the action of heat itſelf; of each of which we ſhall ſay a few words.

With regard to the firſt, the general fact appears to be, that wherever a body is by any means condenſed, its capacity becomes diminiſhed; but that where it is dilated or enlarged in its bulk, it is proportionally increaſed. Thus, if a thermometer be ſuſpended in a receiver, and a quantity of air condenſed into it, the mercury will riſe; a part of the caloric which is contained in the air being, as it were, ſqueezed out by its compreſſion, and forced into the mercury in the bulb, whoſe temperature is conſequently raiſed: if, however, on the contrary, the air be rarefied, the thermometer will indicate cold; the capacity of the air in the receiver being increaſed by its rarefaction, and a portion of the caloric in the contiguous bodies conſequently abſorbed, whereby their temperature is lowered and their bulk diminiſhed. It ſeems probable alſo that the heat produced by friction or percuſſion is, in like manner, to be referred to this kind of diminution in the capacity of the ſubject.

The ſecond mode of changing the capacities of bodies is by their chemical combination; and it is perhaps true, that there is no combination unaccompanied by ſuch a change. In ſome inſtances this takes place in a very remarkable degree, and it is from hence that we derive the effects of calorific and frigorific mixtures. If, for example, a quantity of ſulphuric acid, diluted with an equal meaſure of water, be poured on a quantity of cryſtals of Glauber's ſalt recently powdered, the capacity of the compound is conſiderably greater than that of its component ingredients, it becomes therefore ſtrongly abſorbent of caloric, which it attracts from the bodies in its vicinity, and a quantity of water in a phial placed in the mixture will be ſoon frozen. The converſe takes place in the combination of water and ſulphuric acid. The capacity of the compound becomes diminiſhed by the mutual attraction of the particles of its ingredients; a portion of the caloric which it contains is therefore extricated, and heat is produced by its emiſſion.

The third caſe of change of capacity, by the action of heat itſelf, is perhaps productive of more important effects in nature than either of the other two. The capacities of all bodies are increaſed in ſome proportion to the dilatation of their bulk, and the diſaggregation of their conſtituent particles as well by the agency of caloric as by any other cauſe. Hence, when a ſolid is fuſed, or a liquid reſolved into vapour, cold is produced by the augmentation of its capacity; and *e converſo*, when ſteam is condenſed, or congelation takes place, heat is developed by its diminution. Thus, if equal quantities of pounded ice and water, each at 32° of Fahrenheit, be expoſed to heat in two ſimilar veſſels in a water-bath, the water will be heated to 178° before the ice is all diſſolved, the water produced from which will of courſe ſtill remain at 32°, ſo that the increaſe of capacity in the ice, during its ſolution, is ſufficient to enable it to abſorb, without any elevation of its temperature, as much caloric as has raiſed the temperature of an equal quantity of water 146°; and the like quantity is alſo again emitted, on its becoming again congealed. If a quantity of water be expoſed without agitation to a degree of cold equal to 24° or 25°, it will frequently acquire this temperature without freezing; but as ſoon as congelation begins, the thermometer will immediately riſe to 32°, and the whole will remain at that temperature till all the water is converted into ice. From the quantity of heat which is abſorbed by ice during its ſolution, and the relative capacities of ice and water, which he conjectured from his experiments to be as 9 to 10, Dr. Crawford concludes that, as water on freezing appears to give out 146°, and this conſtitutes $\frac{1}{10}$ of all that it contains, it is probable that the temperature of a body which was entirely diveſted of heat would be 1460° below the freezing point, or 1428° below the zero of Fahrenheit's thermometer.

This latter change of capacity appears manifeſtly to be abſolutely eſſential to the well-being of the univerſe, as affording a conſtant modification of the action of heat and cold, whoſe effects would otherwiſe be inordinate. If this did not take place, the whole of a maſs of water which was expoſed to a temperature above the boiling point would be inſtantly diſſipated in vapour with exploſion. The fact, however, is, that the capacity of thoſe portions of the liquid which are ſucceſſively reſolved into vapour becomes thereby ſufficiently augmented to enable them to abſorb the ſuperabundant caloric, as faſt as it is communicated; and it is for this reaſon that boiling water in an open veſſel never reaches a higher temperature than 212°. The polar ices would all inſtantaneouſly diſſolve, whenever the temperature of the circumambient air was above 32°, if it were not that each particle abſorbs a quantity of caloric in its ſolution, and thereby generates a degree of cold which arreſts and regulates the progreſs of the thaw; and the converſe of this takes place in congelation, which is in its turn moderated by the heat developed in conſequence of the diminution of capacity, which takes place in the water during its tranſition to a ſolid ſtate.

CAPALITA, in *Geography*, a large town of North America, in the province of Guaxaca. The adjacent country abounds with ſheep, cattle, and excellent fruit.

CAPAN, in *Commerce*, an Eaſt Indian coin worth 3*d.* ſterling.

CAPANABASTIA, in *Geography*, a town of North America, in the province of Chiapa in Mexico; 70 miles S. E. of Chiapa des Eſpagnoles.

CAPARACOCH of Buffon, in *Ornithology*, the hawk-owl of Engliſh writers, *Strix Hudſonia* of Gmelin, and *Strix freti Hudſonis* of Briſſon.

CAPARASON, or CAPARISON, the covering or cloathing laid over an horſe; eſpecially a ſumpter, or horſe of ſtate.

The word is Spaniſh, being an augmentative of *cape*, *caput*, *head*.

Anciently the capariſons were a kind of iron armour, wherewith horſes were covered in battle.

CAPAS ISLANDS, in *Geography*, ſmall iſlands near the eaſt coaſt of Malacca, in the Eaſt Indies. N. lat. about 5°. E. long. 103° 30′.

CAPASH, a kind of head-dreſs worn by the women of Candia. It is of a ſtiffened fine muſlin, and is made ſo as to ſtand up very high, and extends out a great way on the right ſide. Pococke's Egypt, vol. ii. part ii. p. 10.

CAPA-VELA, in *Botany*. (Rheed. Mal.) See CLEOME PENTAPHYLLA.

CAPE ASTER. See CINERARIA AMELLOIDES.

CAPE JASMINE. See GARDENIA FLORIDA.

CAPE, in *Geography*, a head-land; or the extremity of a piece of land, or *promontory*, running out beyond the reſt, into the ſea.

CAPE ABACOU, lies near the weſt end of the ſouth coaſt of the iſland of St. Domingo, N. lat. 18° 4′. W. long. 74°.—C. *St. Agnes.* See ST. AGNES.—C. *Agua*, a cape of Spain, on the coaſt of Murcia, in the Mediterranean. N. lat. 37° 32′. W. long. 0° 37′.—C. *Aguer* or *Geer.* See AGUER and GEER.—C. *Aguja*, a double point of South America, on the coaſt of Peru. S. lat. 6° 38′. W. long. 80° 55′—C. *Aguillas.* See AGUILLAS.—C. *Ajo*, a cape of Spain, on the coaſt of Biſcay, in the Atlantic. N. lat. 43° 32′. W. long. 3° 18′—C. *Albatel.* See ALBATEL.—C. *Albiania.* See ALBIANIA.—C. *Algar*, a cape on the N. W. coaſt of the iſland of Majorca. N. lat. 39° 40′. E. long. 2° 38′.—C. *Alice*, a cape of Naples, on the E. coaſt of Calabria Citra, in the gulf of Tarento. N. lat. 39° 30′. E. long. 17° 20′.—C. *Amanſo*, a cape on the S. E. coaſt of the iſland of Corſica, and northern part of the entrance into the bay of Bonifacio.—C. *Amboiſe.* See AMBEEZES.—C. *Ambra.* See AMBRA.—C. *Amouſhe.* See AMOUSHE.—C. *Anciola*, a cape on the W. coaſt of the iſland of *Cabrera*, which ſee. N. lat. 39° 6′. W. long. 3° 8′.—C. *Ancon*, or *Ancoe*, the N. point of the iſland of Chiloe, in the S. Pacific Ocean. S. lat. 42°. W. long. 80°.—C. *Anderville*, a cape of France, on the N. E. coaſt of the department of the Channel; 13 miles W. N. W. of Cherburg. N. lat. 49° 43′. W. long. 3°.—C. *Andrea*, and *St. Andrew's.* See ST. ANDREW'S.—C. *Anguada.* See ANGUADA.—C. *Anguillas*, *Anguille*, *Ann* and *Anne.* See the Articles.—C. *St. Anthony*, a cape on the E. coaſt of Newfoundland. N. lat. 51°. W. long. 56°; alſo, the N. W. point of Staten land, in the ſtraits of Le Maire. S. lat. 54° 46′. W. long. 63° 47′.—C. *Antio*, *Antongil*, *Antonio*, *Apollonia*, and *Arca.* See the reſpective Articles.—C. *Argent*, a cape on the E. ſide of Newfoundland. N. lat. 50° W. long. 55° 15′.—C. *Argentaro.* See ARGENTARO.—C. *Argentera*, a cape on the W. coaſt of Sardinia, 2 miles W. of Argentera. N. lat. 39° 28′. E. long. 8° 36′.—C. *Armi*, a cape of Naples, on the ſouthern coaſt of Calabria Ultra. N. lat. 37° 52′. E. long. 16° 1′.—C. *Aſh oune-mon-kar*, a cape of Algiers, in the Mediterranean. N. lat. 37° 15′. E. long. 5° 10′.—C. *Aſinara*, the N. W. point of Sardinia. N. lat. 40° 58′. E. long. 8° 13′.—C. *Ava*, *St. Auguſtine*, *Baba*, *Baffa*, and *Bajador.* See the ſeveral Articles.—C. *Bainetta*, a cape on the ſouth weſt of the iſland of St. Domingo, near a village of the ſame name. N. lat. 18° 13′. W. long. 72° 51′.—C. *Bajole.* See BAJOLE.—C. *Bajona*, a cape on the E. coaſt of Africa. S. lat. 15° 15′. E. long. 39°.—C. *Balaad*, lies on the N. coaſt of Morocco, in the Mediterranean. N. lat. 35° 32′. W. long. 3° 46′.—C. *Ballaghan*, *Ballard*, *Barbas*, *Bardiſlan*, *Barfleur*, *Barnabas*, *St. Bartholomew*, *Baſſos*, *Baxos*, *Bear's*, and *Beata*. See the reſpective Articles.—C. *Becur*, a cape on the coaſt of Egypt, in the Mediterranean; 4 leagues N. N. E. of Alexandria.—C. *Bede*, *Bedford*. See the Articles. C. *Begu*, a cape of Spain, on the coaſt of Catalonia, in the Mediterranean. N. lat. 41° 57′. E. long. 2° 19′.—C. *Berberia*, a cape on the W. coaſt of the iſland of Formentera, in the Mediterranean. N. lat. 38° 41′. E. long. 1° 36′.—C. *de Berelos*, a cape on the N. coaſt of Egypt, in the Mediterranean; 30 miles W. of Damietta. N. lat. 31° 29′. E. long. 31° 16′.—C. *Bermejo*, a cape on the E. coaſt of Majorca, N. lat. 39° 30′. E. long. 4° 38′.—C. *Bernard*, a cape of Egypt on the N. coaſt, in the Mediterranean. N. lat. 31° 6′. E. long. 33° 43′.—C. *Blanco*, a cape of South America, on the coaſt of Terra Firma. N. lat. 10° 28′. W. long. 67° 16.; alſo, a cape on the S. coaſt of the iſland of Sicily. N. lat. 37° 28′. E. long. 13° 11′.—Alſo, a cape on the S. coaſt of the iſland of Corfu. N. lat. 39° 28′. E. long. 20° 4′.—Alſo, a cape on the S. W. coaſt of the iſland of Cyprus. N. lat. 35° 12′. E. long. 32° 15′.—Alſo, a cape of Spain, on the coaſt of Aſturia. N. lat. 43° 26′. W. long. 6° 37′.—Alſo, a cape on the W. coaſt of the iſland of Ivica. N. lat. 39° 2′. E. long. 1° 33′.—Alſo, a cape on the S. coaſt of the iſland of Majorca. N. lat. 39° 22′. E. long. 2° 59′. For other capes of this denomination, ſee Blanco.—C. *St. Blaiſe*. See Blaise.—C. *St. Blaize*, the outermoſt point of Moſſel bay, in the Cape of Good Hope. S. lat. 34° 10′. E. long. 22° 18′. C. *St. Blas*, a cape of America, on the coaſt of the Iſthmus of Darien. N. lat. 9° 36′. W. long. 79° 24′.—C. *Bluff*, a cape on the E. coaſt of Labrador. N. lat. 53°. W. long. 55° 30′.—C. *Bocv*, a cape on the W. coaſt of the iſland of Sicily. N. lat. 37° 51′. E. long. 12° 45′.—C. *Bogachua*, a cape on the ſouth-eaſt of Arabia; 150 miles S. W. of Cape Fartaſh. N. lat. 14° 15′. E. long. 48° 15′.—C. *Bojador* and *Bon*. See the Articles.—C. *Bonandria*, a cape of Africa, on the coaſt of Barbary, in the Mediterranean. N. lat. 32° 20′. E. long. 23° 14′.—C. *Bonaventura*, *Bonaventure*, and *Bonaviſta*. See the Articles.—C. *Braſa*, a cape of America, on the N. coaſt of the Iſthmus of Darien. N. lat. 9° 22′. W. long. 80° 10′.—C. *Break*. See Break.—C. *Bredanach*, a cape of Scotland, on the W. coaſt of the iſland of Rum.—C. *Brema*. See Brema.—C. *Breton*. See Breton.—C. *Brett*, a cape on the E. coaſt of the northernmoſt iſland of New Zealand. S. lat. 35° 10′. E. long. 174° 37′.—C. *Briſtol*, *Broyle*, and *Buller*. See the reſpective Articles.—C. *Burela*, a cape of Spain on the N. coaſt of Galicia. N. lat. 43° 41′. W. long. 7° 7′.—C. *Burulaque*, the northern point of Zebu or Sebu, one of the Philippine iſlands. N. lat. 11° 6′. E long. 122° 31′.—C. *Burzano*, a cape of Naples near the ſouthern extremity of Calabria Ultra, on the E. coaſt. N. lat. 37° 56′. E. long. 16° 29′.—C. *Buſto*, a cape of Spain, on the coaſt of Aſturia. N. lat. 43° 37′. W. long. 6° 14′.—C. *Butifaras*, a cape on the S. W. of Minorca. N. lat. 39° 48′. E. long. 4° 28′.—C. *Byron*, the S. W. extremity of New Iceland, in the Pacific ocean. S. lat. 2° 30′. E. long. 149° 2′.—Alſo, a cape on the N. E. coaſt of New Guernſey. S. lat. 10° 40′. E. long. 164° 49′.—Alſo, a cape on the E. coaſt of New Holland. S. lat. 28° 37′. E. long. 153° 30′.—C. *Cabron*. See Cabron.—C. *Caccia*, a cape on the W. coaſt of Sardinia, 13 miles W. of Algeri.—C. *Caglia*. See Caglia.—C. *Calbache*, a cape on the W. coaſt of Porto Rico. N. lat. 18° 28′. W. long. 31° 34′.—C. *Calibong*, a cape on the N. coaſt of the iſland of Java. S. lat. 6° 18′. E. long. 110° 45′.—C. *Camboja*, the ſouthern extremity of the kingdom of Camboja, on the eaſtern coaſt of the gulf of Siam. N. lat. 9° 10′. E. long. 104° 30′.—C. *Cameron*, a cape of North America, on the coaſt of Honduras. N. lat. 15° 30′. W. long. 85° 54′.—C. *Campbel*, a cape on the E. coaſt of New Zealand. S. lat. 41° 44′. W. long. 188° 4′.—C. *Canan*. See Mijorata.—C. *Canet*, a cape of Spain, on the coaſt of Valencia. N. lat. 39° 40′. W. long. 0° 1′ Other capes, that occur in the ſequel, are mentioned under their appropriate names, and thoſe of the diſtricts and countries to which they belong.

Cape *of Good Hope*, a promontory of the ſouthern part of Africa, firſt diſcovered in 1487 by Bartholomew Diaz, a Portugueſe officer of diſtinguiſhed ſagacity, experience, and fortitude, and called by him, on account of the violence of the tempeſts with which he encountered, "Cabo Tormentoſo," or Stormy Cape; but his maſter, John II king of Portugal, entertaining no doubt of his having found the long deſired route to India, gave it a name of better omen, viz. "The Cape of Good Hope." Diaz merely deſcried this promontory; but the violence of the wind, the ſhattered condition of his ſhips, and the turbulent ſpirit of his ſailors, compelled him to return, after a voyage of ſixteen months. In 1497, Emanuel, king of Portugal, inheriting the enterpriſing genius of his predeceſſors, and perſiſting in their grand ſcheme of opening a paſſage to the Eaſt Indies by the Cape of Good Hope, equipped a ſquadron, conſiſting only of three veſſels, for this important voyage, and gave the command of it to Vaſco de Gama, a man of noble birth, and poſſeſſed of virtue, prudence, and courage, equal to the ſtation. Accordingly Gama ſet ſail from Liſbon on the 9th of July, and, after ſtruggling for four months with contrary winds, reached the Cape on the 20th of November. During an interval of calm weather he doubled that formidable promontory, which had ſo long been the boundary of navigation, and, after touching at ſeveral parts along the eaſtern African coaſt, terminated his voyage at Calicut on the coaſt of Malabar. See Calicut. Vaſco de Gama, however, made no attempt to form a ſettlement at the Cape. Next to Vaſco de Gama was the Portugueſe admiral Rio d'Infanté, who, in his voyage to India in 1498, went aſhore, and, on his return, ſtrongly recommended to his government the eſtabliſhment of a colony on the ſouthern continent of Africa; and he fixed upon the mouth of a river for that purpoſe, to which was given his own name, and which is now called the "Great Fiſh River." Some other attempts, by different Portugueſe navigators, were made to colonize the Cape, but they all failed. After this the Engliſh and Dutch frequently viſited the bays of the Cape. The Engliſh, in their outward-bound voyages, had a cuſtom of burying their diſpatches for the directors, and of pointing out where they were to be found, by cutting a ſentence to that effect on ſome large blue ſtone laid on a particular ſpot. The intelligence, engraven on the ſtone, was uſually limited to the name of the ſhip and captain, the date of her arrival and departure, and ended with, "Look for letters (in ſuch or ſuch direction) from this ſtone." Two or three ſtones of this kind are fixed in the caſtle-wall, and are ſtill legible. The Dutch uſed to bury, on a certain ſpot in Robben iſland, a regiſter of the ſtate of their veſſels and cargoes outward-bound, which the next ſhip, in coming home, took up and carried to Holland for the information of the directors. In this manner the Engliſh, the Dutch, and the Portugueſe, continued, for more than a century, to refreſh at the Cape, without any deſign on the part of the two former of appropriating the ſoil, until the year 1620, when the commanders of two fleets of Engliſh ſhips, bound for Surat and Bantam, took a formal poſſeſſion of the ſoil for, and in the name of, king James of Great Britain, becauſe they diſcovered that the Dutch intended to eſtabliſh a colony there in the following year. It was not, however, until a period of more than 30 years had expired after this event, that Van Riebeck, ſurgeon of a ſhip that put into the Cape for the uſual purpoſe, made repreſentations of the richneſs of the ſoil, the mildneſs of the climate, the advantages it would give to the Dutch, as a colony, over other nations, whoſe ſhips would all be obliged to touch there, and, above all, the barrier it would afford to their Indian dominions; which prevailed on the directors of the Dutch Eaſt India Company to form a regular eſtabliſhment at the Cape. Van Riebeck was appointed admiral of four ſhips properly equipped for ſuch an expedition, and, on his arrival at the Cape, governor in chief, with full power to eſtabliſh a ſettlement. He no ſooner propoſed than concluded a treaty; and the Dutch took immediate poſſeſſion of the Cape, which was ſurrendered to them by the natives with great ſolemnity. Van Riebeck erected a ſquare fort, containing lodgings, warehouſes, and an hoſpital for the ſick, and raiſed outworks and batteries to ſecure their ſettlements from all attacks. The original intention of the Dutch ſeems to have been to limit their poſſeſſions to the Cape peninſula, and the two bays that are divided by the iſthmus; conſidering it only, as it had hitherto been, a place for refreſhing and refitting their ſhips. But the number of ſettlers that joined them from time to time, in conſequence of the placard which they publiſhed for their encouragement, made it neceſſary to croſs the iſthmus, and, by preſents and promiſes, to obtain from the natives the ceſſion of a tract of land, to which they gave the name of "Hottentots' Holland." The natives had probably no idea of reſigning, for ever, to a foreign nation, the ground that was neceſſary for feeding their own cattle; but conceived it could only be intended for temporary uſe, and that, in time, they would depart from the country, as other Europeans had done for the laſt century and a half: but, when they obſerved them building houſes and fortifications, ſowing and planting the ground, and rearing their own cattle, they began to be jealous of the encroachments of their new neighbours, and commenced hoſtilities for the purpoſe of expelling them. Theſe hoſtilities terminated in the further extenſion of the Dutch ſettlement, and in an increaſe of troops and coloniſts from Europe. Still, however, the Dutch Eaſt India Company endeavoured to limit the Cape to the original deſign of a port for refreſhing their ſhips. They threw every obſtacle in the way of its becoming a flouriſhing ſettlement; allowed no trade whatſoever but that which paſſed through the hands of their own ſervants, and made it dependent on the governor-general of Batavia; concluding that the ſettlers would thus be made equally ſubmiſſive to their orders from Europe, and from the ſeat of their wealth and influence in the Eaſt. A colony, in ſuch a ſtate, with their declining commerce, entailed upon them a burden and expence too heavy for them to bear; and little doubt was entertained of their inclination to part with it for a moderate ſum of money, juſt before the French revolution and its deſtructive conſequences unſettled the affairs of all Europe. Overtures to this effect were intended to be made by England about the time when the above unfortunate event took place. It became wiſe and neceſſary, however, to recur to other meaſures for obtaining poſſeſſion of this Dutch colony. Accordingly, an expedition was ſent out for this purpoſe; which was commiſſioned not to act in an hoſtile manner, but to hold the Cape in defence and ſecurity for, and in the name of, the prince of Orange, who, having departed from Holland, furniſhed letters dated from London to this effect. Many of the coloniſts had, in the mean while, imbibed French principles, and became clamorous to declare themſelves, by ſome public act, a free and independent republic: they prepared to plant the tree of liberty, and eſtabliſhed a convention, whoſe firſt object was to make out proſcribed liſts of thoſe who were either to ſuffer death by the guillotine, or to be baniſhed out of the colony. The perſons ſo marked out to be the victims of an unruly rabble were ſelected from among the moſt worthy people in the ſettlement, and moſt of them were members of the government. The ſlaves, whoſe numbers of grown men are about five to one of male whites, had alſo their meetings to decide upon the fate of the free and independent burghers, when the happy days of their own emancipation ſhould arrive.

In this ſtate of things the Britiſh fleet appeared before the bay; and it became neceſſary to commence hoſtilities. The rocks of Muiſenberg were ſoon cleared by a few ſhot from a man of war, and the regular troops retreated to Wynberg, a tongue of land projecting from the eaſt ſide of the Table mountain, and about eight miles from Cape-town. The Britiſh troops, led on by general ſir James Craig, under the orders of ſir Alured Clarke, marched to attack the enemy on their elevated poſt, and aided by the ſailors, ſoon obliged them to retreat within their lines. A capitulation was propoſed and accepted, in September 1795; and the next day it was concluded between the two parties. By the 6th article of the treaty of peace at Amiens in March, 1802, it was ſtipulated, that the port of the Cape of Good Hope ſhould remain to the Batavian republic, in full ſovereignty, in the ſame manner as it did previous to the war; but that the ſhips of every kind belonging to the other contracting parties ſhould be allowed to enter the ſaid port, and to purchaſe neceſſary proviſions, without paying any other impoſt than ſuch as the Batavian republic demands the ſhips of its own nation to pay.

In order to form a juſt idea of the dimenſions of the Cape ſettlement, we may ſuppoſe a ſtraight line to be drawn from the ſouthern point of the Cape peninſula, which, however, is not the ſouthernmoſt point of Africa, in the direction of eaſt by north, and this line will interſect the mouth of the Great Fiſh river (the Rio d'Infanté of the Portugueſe), which is now conſidered as the eaſtern boundary of the colony. The length of this line is about 580 miles. Again, if from the ſame point a ſtraight line be drawn in the direction of north, with a little inclination weſterly, it will fall in with the mouth of the river "Kouſſie," the northern boundary of the colony, at the diſtance of about 315 miles. Moreover, if from the mouth of the Great Fiſh river, a line drawn in the direction of north-north-weſt, be continued to the diſtance of 225 miles, to a point behind the Snowy mountains called "Plettenberg's land-mark," and from thence be continued in a circular ſweep inwards to the mouth of the river "Kouſſie" upwards of 500 miles; theſe lines will circumſcribe the tract of country which conſtitutes the colony of the Cape of Good Hope. By reducing this irregular figure to a parallelogram, it will be found to comprehend an area of at leaſt 120,000 ſquare miles; and as the whole population of whites, blacks, and Hottentots, within this area, amounts only to about 60,000 perſons, every two ſquare miles may be ſaid to have at leaſt *one* human creature allotted to it. But as this deſert ſtate of the colony is leſs owing to the natural defects of the country, than to the regulations under which it has been governed, the population, compared with the extent of ſurface, ought not to be taken as the teſt of the intrinſic value of the ſettlement; ſince the population of any country, under a moderate climate, will, in the natural courſe of things, always riſe to a level with the means of ſubſiſtence. If we eſtimate the ſoil of the Cape by the abundance or ſcarcity, the luxuriance or poverty, of the native plants, independently of the clime, it would be pronounced one of the pooreſt in the known world; for ſeven parts in ten of the above-mentioned ſurface are, for a great part of the year, and ſome of them at all times, altogether deſtitute of verdure. The upper regions of all the chains of mountains are naked maſſes of ſand-ſtone; the valleys beneath them are clothed with graſs, with thickets, and in ſome caſes with impenetrable foreſts. The inferior hills or knolls, whoſe ſurfaces are generally compoſed of looſe fragments of ſand-ſtone, as well as the wide ſandy plains that connect them, are thinly ſtrewed over with heaths and other ſhrubby plants, exhibiting to the eye an uniform and dreary appearance. In the loweſt parts of theſe plains, where the waters ſubſide, and, filtering through the ſand, break out in ſprings upon the ſurface, vegetation is ſomewhat more luxuriant. In ſuch ſituations the farm-houſes are generally placed; and the patches of cultivated ground contiguous to them, like the “Oaſés” in the ſandy deſerts, may be conſidered as ſo many verdant iſlands in the midſt of a boundleſs waſte. Of ſuch plains and knolls is the belt of land compoſed, that lies between the firſt chain of mountains and the ſea-coaſts. Soils, in this tract of country, are generally either a ſtiff-clay, impenetrable by the plough till they are ſoaked by much rain, or light and ſandy, tinged with red and abounding with ſmall round quartoze pebbles. A black vegetable mould ſeldom appears except in patches of garden-ground, vineyards, and orchards that ſurround the habitations, where, by long culture, manure, and the fertilizing influence of ſprings or rills of water, the ſoil is ſo far mellowed as to admit the ſpade at all ſeaſons of the year. The extenſive plains, known in the colony by the Hottentot name of “Karroo,” which are interſperſed between the great chains of mountains, exhibit a more diſmal appearance than the lower plains, which are chequered with patches of cultivated ground; and their hard ſurfaces of clay, gliſtering with ſmall cryſtals of quartz, and condemned to perpetual drought and aridity, are ill adapted to vegetation. The hills that break theſe barren plains, are chiefly compoſed of fragments of blue ſlate, or maſſes of feltſpar, and argillaceous limeſtone. However, in thoſe Karroo plains, that are tinged with iron, and that are capable of being watered, the ſoil is extremely productive. In ſuch ſituations, more eſpecially in the vicinity of the cape, they have the beſt grapes, and the beſt fruit of every ſort. The climate of the Cape is not unfriendly to vegetation; but it is ſo ſituated, within the influence of periodical winds, that the rains are very unequal, deſcending in torrents during the cold ſeaſon, though hardly a ſhower falls to refreſh the earth in the hot ſummer months, when the dry ſouth-eaſt winds prevail. Theſe winds blaſt the foliage, bloſſom, and fruit of all thoſe trees that are not well ſheltered; nor is the human conſtitution ſecure againſt their injurious influence. They relax both the body and mind, and deaden their powers of energy and activity. As a protection from theſe winds, the coloniſts who inhabit the nearer ſide of the firſt chain of mountains, beyond which their effect does not very ſenſibly extend, divide that portion of their ground, which is appropriated to fruit groves, vineyards, and gardens, by oak ſcreens; but they leave their corn lands altogether open. Indeed, a cape boor beſtows no more labour on his farm than is abſolutely neceſſary; and as grain is moſtly reaped before the ſouth eaſt winds are ſet in, the encloſure of the arable land is omitted. The temperature of the climate at the Cape is remarkably affected by local circumſtances. During the winter months, May, June, and July, the mean temperature, according to the ſtatement of Kirwan (Eſtimate, &c. p. 102), ſeems to be from 45° to 55°; the heat ſcarcely exceeds 64°, and ſeldom falls ſo low as 34°; in ſummer the thermometer is generally between 70° and 80°, and ſometimes between 80° and 90°, but ſcarcely ever exceeds 95°; the ſouth-eaſt wind, he adds, is the coldeſt. Mr. Barrow informs us (*ubi infra*), that there is a difference of at leaſt from 6 to 10 degrees of Fahrenheit, in the ſummer months, between Cape Town and Wynberg, within a diſtance of only about 7 or 8 miles; which ariſes from the latter place being ſituated on the windward ſide of the Table mountain, and the former lying to leeward of it. The variation of climate, to which the Table valley is ſubject, led a Britiſh officer to obſerve, that thoſe who inhabited it were either in an oven, or at the funnel of a pair of bellows, or under a water-ſpout. On the Cape ſide of the mountains the thermometer rarely deſcends below 40°; but on the elevated Karroo plains, within the mountains, it is generally, in the winter months, below the freezing point by night, and from 70 to 80 in the middle of the day. In order to account for the intenſe cold of the Karroo plains, Van Humboldt adduces the chemical decompoſition of the atmoſpherical air. As fat and clayey earths are ſtrongly diſpoſed to attract the oxygen from the atmoſphere, by which the azotic gas is let looſe: this gas entering again into combination with freſh oxygen, of the ſuperincumbent ſtratum, in an increaſed proportion, forms nitric acid, from which ſalt petre is generated. The conſequence of this formation which actually takes place in thoſe plains, muſt neceſſarily be a great diminution of temperature.

We may now proceed to obſerve, that the great ſcarcity of water in ſummer is much more unfavourable to an extended cultivation than either the ſoil or the climate. The torrents of rain that deſcend for about four months in the year, deluging the whole country, diſappear ſuddenly in the deep channels that interſect the country, and in conſequence of their ruſhing with rapidity and violence into the ſea, and leaving the deeply ſunken beds of the rivers nearly dry, afford no ſufficient ſupply of water to anſwer the purpoſes of irrigation. The periodical rivulets, and the ſtreams that iſſue from the mountain ſprings, are either abſorbed or evaporated before they arrive at any great diſtance from their ſources; ſo that in this extenſive colony one can ſcarcely ſay that there is a ſingle navigable river. The two principal rivers, on the weſtern coaſt, are the “Berg,” or Mountain river, which riſes in the mountains that encloſe the vale of Drakenſtein, and falls into St. Helena bay, and the “Oliphant,” or Elephant's river, which, after collecting the ſtreamlets of the firſt chain of mountains in its northerly courſe along their feet, empties itſelf into the Southern Atlantic in S. lat. 31° 30′. Although both theſe rivers have permanent ſtreams of water, ſufficiently deep to be navigable by ſmall craft to the diſtance of about 20 miles up the country, yet the mouth of the former is choaked up with a bed of ſand; and acroſs the latter is a reef of rocks. On the ſouth coaſt of the colony the permanent rivers of any magnitude are the “Broad” river, which is diſcharged into St. Sebaſtian's bay, croſſed near its mouth by a bar of ſand, but navigable within this bar by ſmall craft about 30 miles up the country, in which extent there are ſcarcely half a dozen farm-houſes; the “Gauritz” river; the “Knyſna;” the “Keurboom;” the “Camtoos;” the “Zwartkops;” the “Sunday;” and the “Great Fiſh” rivers; which ſee reſpectively. All theſe rivers are well ſtocked with perch, eels, and ſmall turtle, and, to a certain diſtance from the ſea-coaſt, they abound with almoſt every kind of ſea-fiſh peculiar to this part of the world. Beſide theſe rivers, the whole ſlip of land, ſtretching along the ſea-coaſt, between the entrance of Falſe bay and the Great Fiſh river, is interſected by ſtreamlets, whoſe waters are neither abſorbed nor evaporated; but they generally run in ſuch deep chaſms, that they are of little uſe towards the promotion of agriculture by the aid of irrigation. In order to account for theſe deep chaſms or cavities, and the general ſcarcity of ſprings, notwithſtanding the quantity of rain that annually falls at the Cape, Mr. Barrow ſuggeſts the following conſiderations. All the continued chains of mountains in Southern Africa are compoſed of ſandſtone, reſting upon a baſe of granite. The granite baſe is ſometimes elevated conſiderably above the general ſurface of the country, and ſometimes its upper part is ſunk as far beneath it. In ſituations where the former circumſtance occurs, numerous ſprings are found, as in the Table mountain, where, on every ſide, copious ſtreams of pure limpid water, filtered through the immenſe maſs of ſuperincumbent ſandſtone, glide over the impenetrable ſurface of granite, and furniſh an ample ſupply to the whole town, the gardens, and the adjacent farms. But in thoſe places where the ſandſtone continues to deſcend below the ſurface, and the upper part of the granite baſe is ſunk beneath the general level of the country, the ſprings that make their appearance are few and ſcanty. From theſe facts it is inferred, that the ciſterns or cavities in the ſand-ſtone mountains, being corroded in the lapſe of ages, to a greater depth than the openings or conduits, which might, perhaps, at one time have given their waters vent, the ſprings can no longer find their way upon the ſurface, but oozing imperceptibly between the granite and the ſand-ſtone, below the general level of the country, glide in ſubterraneous ſtreams to the ſea. It is a well known fact, that on almoſt every part of the iſthmus that connects the mountainous peninſula of the Cape to the continent, freſh water may be procured at the depth of 10 or 12 feet below the ſandy ſurface. Other facts of a ſimilar nature ſerve to evince the erroneouſneſs of the opinion, that has generally prevailed, that the ſeveral bays of the colony cannot, without great difficulty, if at all, be ſupplied with freſh water. This great depth of the commencement of the granite baſe below the ſurface may alſo better account for the moſt conſiderable rivers of Africa loſing themſelves in the ſand, before they reach the ſea, than by ſuppoſing the interior parts of this continent to be lower than the level of the ocean.

Another circumſtance that has very much contributed to retard the cultivation of the territories adjoining to the Cape, is the extreme indolence of the coloniſts. In this fine climate they engage in little or no manual labour. The extent of the foreſts, beginning at Moſſel bay, and running eaſtward parallel to the ſea-coaſt, is at leaſt 250 Engliſh miles, and the breadth from the baſe of the mountains to the ſea is 10, 15, and in ſome places, 20 miles. Of this tract a great part is compoſed of large and beautiful plains, interſected by numerous rivers, and abounding in lakes full of excellent fiſh. The ground is well adapted either to paſturage or tillage, and capable of complete irrigation; but the farmers here, as well as in all other parts of the colony, are lazy beyond deſcription; the grounds held by each being ſufficient for a great number of induſtrious families. It has been ſaid, that the ſlip of land between the firſt chain of mountains and the ſea-coaſt, and from Zwellendam to Algoa bay, if well ſtocked with inhabitants, ſo that each would be under a neceſſity of labouring for a ſubſiſtence, would not only be able to furniſh a ſupply of grain for the whole colony, but afford alſo a ſurplus for exportation. But though this opinion may not be ſtrictly juſt, yet Mr. Barrow is confident, that, with the addition of the tract of country between the north range of mountains and the weſt coaſt, and from St. Helena bay to the Cape, the whole maſs of people within the preſent limits of the colony might be more comfortably ſubſiſted than they now are, and have an abundance of corn, cattle, wine, and other neceſſaries, over and above, for a garriſon of 5000 men, and for a fleet containing an equal number. But in order to make the country produce this ſupply, it will be neceſſary to procure a new race of inhabitants, or to change the nature of the old ones.

It is impoſſible, ſays this ingenious writer, to convey, by any deſcription, an adequate idea of the condition of the peaſantry of the Cape of Good Hope; as it is ſo inconceivably different from that of the ſame claſs in Europe, or indeed in any other part of the world. In the miſerable hovels of the Cape boors ſalted beef, or fleſh of the larger kinds of game, will be found hanging in the chimney, and the whole or greater part of a ſlaughtered ſheep may be ſeen ſuſpended from the roof. A Cape boor never works. His greateſt and moſt pleaſing exertion is the killing of game. But in this kind of exerciſe he manifeſts no energy or activity, and ſubmits to no fatigue. A Dutch boor never traverſes the heath on foot, but generally fires from the ſaddle; and even avoiding the fatigue of carrying his muſket, he is followed by a Hottentot boy, trained to ride or run after him as his armour-bearer. It is a miſtaken notion, that the peaſantry of the Cape are a poor and diſtreſſed people, overwhelmed with debt, burdened with taxes, and oppreſſed by the government in a variety of ways. This will ſufficiently appear in the ſequel of this article. But they are better fed, more indolent, more ignorant, and more brutal than any ſet of men, bearing the reputation of being civilized, upon the face of the whole globe. Inſtances frequently occur of their ſavage and inhuman treatment of the HOTTENTOTS, whom they retain in a ſtate of connection and dependance, by violence and oppreſſion on one ſide, and by want of energy and patient ſuffering on the other. This ſanguinary character of many of the African coloniſts may, perhaps, be owing, in a certain degree, to the circumſtance of their having been ſoldiers in German regiments ſerving abroad; where the leaſt relaxation from a rigid ſyſtem of diſcipline is followed up by the greateſt ſeverity of puniſhment. People of this deſcription, having riſen into affluence by the general proſperity that followed the conqueſt of the ſettlement, and indulging indolent habits and luxurious living, become no leſs groſs in their perſons than vulgar in their manners. Whilſt they pay little attention to domeſtic and ſocial intercourſe, and are in a very culpable degree regardleſs of character, they are extremely tenacious of their rank. There are, however, many perſons in the colony to whom theſe obſervations are not applicable; men, whoſe talents and information, propriety of conduct, and ſtrict integrity, would command reſpect in any part of the world: but their number is not very conſiderable. The Malay ſlaves, in the ſervice of the Dutch, are unaccountably preferred to the Hottentots; though they are generally much inferior to the latter in talents, and much more capricious, cruel, and revengeful. The proportion of ſlaves to whites, of both ſexes and all ages, in the Cape town, is not more than two to one; but that of ſlave men to white men is near five to one. The field ſlaves belonging to the farmers are not, however, nearly ſo well treated as thoſe of the town; yet infinitely better than the Hottentots who are in their employ; the farmer, indeed, having a life-intereſt in the one, and only 25 years in the other, is a circumſtance that may explain the difference of treatment. The one, alſo, is convertible property, which is not the caſe with reſpect to the other. The country ſlaves, notwithſtanding, are ill fed, ill cloathed, work extremely hard, and are frequently puniſhed with great ſeverity ; ſometimes with death, when rage overpowers the dictates of prudence and the feelings of compaſſion.

Mr. Barrow, in the 2d volume of his "Travels in Southern Africa," has ſtated and examined, very much in detail, the advantages which the Cape of Good Hope poſſeſſes, as a military ſtation ; as a port and naval ſtation ; and as a commercial emporium and territorial acquiſition. By a military ſtation Mr. Barrow means, not only a garriſon for the defence of the ſettlement, but likewiſe a depôt, or place ſuitable for collecting and forming, ſo as always to have in readineſs, a body of troops, either belonging to his majeſty's regular regiments, or to the armies of the Eaſt India company, fitted and prepared for foreign ſervice, and ſeaſoned for the climate either of the Eaſt or Weſt Indies. This ingenious writer is of opinion, that the Cape of Good Hope eminently points out ſuch a ſtation. Its geographical poſition on the globe is ſuch as evidently to recommend it for this purpoſe. Its diſtance from the coaſt of Brazil is the voyage of a month ; from the Dutch colonies of Surinam, Demarara, Berbice, and Eſſiquebo, with the Weſt India iſlands, ſix weeks ; the ſame to the Red Sea ; and two months to the coaſts of Malabar and Coromandel. With the eaſt and the weſt coaſts of Africa and the adjacent iſlands, it commands, at all ſeaſons of the year, a ready communication. It is ſo ſituated, juſt half way between England and India, in a temperate and wholeſome climate, and productive of refreſhments of every deſcription, as to poſſeſs peculiar and very diſtinguiſhing advantages for a ſtation and depôt, that would admirably ſuit the views and occaſions of the Eaſt India company in particular. To England the Cape is more valuable as a point of effectual ſecurity to her Indian trade and ſettlements, than as a place of annoyance to other nations, or as to the means it affords of interrupting their commercial concerns. Conſidered as a naval ſtation, the Cape would ſecure us a port for refreſhing and refitting the ſhips of the Eaſt India company ; as a ſtation for ſhips of war commanding the entrance into the Indian ſeas ; and as affording, by its geographical poſition, a ready communication with every part of the globe. Again, the Cape, conſidered in a commercial point of view, might be rendered extremely advantageous to the intereſts of the Britiſh empire, as an emporium of Eaſtern produce ; as furniſhing articles of export for conſumption in Europe and the Weſt Indies ; as taking, in exchange, for colonial produce, articles of Britiſh growth and manufacture ; and as a central depôt for the ſouthern whale-fiſhery. The chief articles of colonial growth and produce conſumed upon the ſpot, and exported to the Eaſt Indies, Europe, and America, may be compriſed under the heads of grain and pulſe, wine and brandy, wool, hides and ſkins, whale oil and bone, dried fruits, ſalt proviſions, ſoap and candles, aloes, ivory, and tobacco. The wheat produced at the Cape is ſaid to be as good and heavy as that of moſt other parts of the world. A load of this grain conſiſts of ten "muids," or ſacks, equal to 31 Wincheſter buſhels ; and a "muid," or $3\frac{1}{10}$ Wincheſter buſhels, uſually weighs 180 Dutch pounds; which are equal to $191\frac{1}{4}$ pounds Engliſh. The returns are from 10 to 70, according to the nature of the ſoil, and the ſupply of water. Barley, i. e. beer or big, is a productive grain at the Cape, and is only uſed for feeding horſes. Rye is alſo a thriving grain, and is little uſed except for cattle in a green ſtate, and oats, which run much into ſtraw, and are fit only for horſes as green fodder. Peas, beans, and kidney beans, Indian corn or maize, and various kinds of millet, may be ſupplied to any amount. However, the Cape, in its preſent ſtate, is not capable of exporting any grain. Wine and brandy may be conſidered as the ſtaple commodities of the Cape of Good Hope. Ten or twelve different kinds of wine are manufactured at the Cape, having a diſtinct flavour and quality according to the farms on which they are produced. The beſt bodied wine that is made at the Cape, is the Madeira, ſent to Holland and the Dutch ſettlements in India, taken by the Americans in exchange for ſlaves, and purchaſed by Engliſh merchants. See CONSTANTIA.

The country boor ſells his new wine to the merchants in the town, where it is adulterated in a variety of ways. The pipe is called a "legger," and contains 8 half aums or 160 gallons ; each legger paying to government a duty, on entering the town, of 3 rix-dollars. The farmer generally receives from 20 to 30 rix-dollars per legger, which, after adulteration, is ſold from 40 to 60, and frequently at the rate of 80 to 100 rix-dollars. Brandy might become a very important commodity as an article of export ; but the cultivators of the vine have at preſent no proper diſtillatory apparatus, nor ſufficient knowledge properly to conduct thoſe which they have. It is exported at 80 to 160 rix-dollars per legger, and ſubject to the ſame toll, on entering the town, as wines : and both wine and brandy are liable to a further duty of 5 rix-dollars per legger on exportation. The whole export value of wines, including the Conſtantia, and the brandy, may amount, one year with another, to about 50,000 rix-dollars, or 10,000l. currency. Wool, which has till a late period been neglected, is likely to become a ſource of colonial revenue. It is ſaid to have been ſold, in its rough ſtate, in the London market at 3s. to 3s. 6d. the pound. It admits of great improvement. The mutton of the Cape ſheep is coarſe and deſtitute of flavour. Hides and ſkins, both dried and ſalted raw, are an increaſing article of exportation. The quantity of ox-hides exported may amount to between 2000 and 3000 annually, ſubject to a duty of $3\frac{1}{2}$d. a piece. Thoſe taken off cattle, killed in the country, are uſed as harneſs for their waggons, and thongs to ſupply the place of cordage. The ſkins of ſheep, killed in the country, are converted into ſacks, and employed as clothing for the ſlaves and Hottentots. Few are exported. The ſkins of the wild antelopes and leopard, though brought occaſionally to the Cape market, hardly deſerve mention as articles of export. The caſe is the ſame with regard to oſtrich feathers ; the annual amount of which is very trifling. The whole value of one year's exportation of this article does not exceed 1000 rix-dollars ; of hides and ſkins of every deſcription not more than 5000 or 6000 rix-dollars. All the whales which have been caught in the bays of the Cape are females of a ſmall ſize, and yielding from 6 to 10 tons of oil each. The bone is ſmall, and, on that account, of no great value. Under the head of dried fruits, the moſt important articles are almonds and raiſins. The cultivation of vines admits of great improvement ; better grapes are not produced in any part of the world than thoſe at the Cape of Good Hope : but neither their wines nor raiſins are properly managed. The almonds are, in general, very ſmall, but of good quality ; and as the trees thrive well in the drieſt and worſt ſoils, the quantity of theſe nuts might be produced to an indefinite amount. Before the capture almonds ſold from 1s. to 1s. 6d. ſterling the thouſand, and raiſins from 2d. to 3d. a pound ; but their price has ſince conſiderably advanced. Dried peaches, apricots, pears, and apples, are not only plentiful, but good of their kind. The whole value of dried fruit, ſhipped in the year 1802, amounted only to 2542 rix-dollars, ſubject to a duty on exportation of 5 per cent. Salt proviſions are ſuſceptible of great improvement, by curing them at Algoa bay, and bringing them down in ſmall coaſting veſſels to the Cape. Salt is ſpontaneouſly produced

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within a ſew miles of Cape-town, by the evaporation of water in the ſalt lakes that abound along the weſt coaſt of the colony. Two kinds of fiſh, the "Hottentot" and the "Snook," are ſalted and dried in the ſun in large quantities, for the uſe of the agricultural ſlaves, who eat them by way correcting the bilious effects of bullocks' livers and other offal, that conſtitute a great part of their food. Salt-butter is a very material article for the conſumption of the town, the garriſon, and the navy, and alſo for exportation. That which comes from the Snowy mountains is accounted the beſt; but very little of it is good. Soap is manufactured by almoſt every farmer in the country, and furniſhes in ſome parts the means of procuring cloaths and other neceſſaries at their annual viſit to Cape-town. The unctuous part is chiefly derived from the fat of ſheeps' tails, and the potaſh or barilla is the lixiviated aſhes procured from a ſpecies of ſalſola called "canna," that grows abundantly on thoſe parts of the Karroo, or deſerts, that are interſected by periodical ſtreams of water. Candles are ſeldom brought out of the country; but a vegetable wax, collected from the berries of a ſhrubby plant, the "myrica cerifera," plentiful on the dry marſhy grounds near the ſea-ſhore, is ſometimes ſent up to the Cape in large green cakes, and ſold from 1s. to 1s. 3d. a pound. The tallow purchaſed at the Cape is hardly ſufficient for the conſumption of the town and garriſon, and the candles made from it are ſeldom lower than 1s. 3d. a pound. The aloe perfoliata, or ſuccotrina, is produced in large tracts of ground, many miles in extent, which are covered with ſpontaneous plantations of it; and eſpecially in the diſtrict of Zwellendam, not far from Moſſel-bay. A load of aloes at Cape-town is worth from 18l. to 20l. The total amount of this article, entered on the cuſtom-houſe books, in the courſe of 4 years from 1799 to 1802, was 341,927 lbs., value 25,665 rix-dollars. It is ſubject to an exportation duty of 16d. for every 100 pounds. Ivory is now become ſcarce, few elephants being found within the limits of the colony. The whole quantity exported in the courſe of 4 years amounted only to 5981 pounds, value 6340 rix-dollars. The hippopotamus, or ſea-cow, whoſe teeth furniſhed the beſt ivory, is no longer within the limits of the colony. The colony is capable of producing great quantities of tobacco; however, very little is exported, though the Cape tobacco is ſaid to be as good, when duly prepared, as that of Virginia. As all male perſons, old and young, ſmoke in the Cape, and as American tobacco generally bears a high price, the conſumption of that of native growth is conſiderable. The inferior ſort is uſed by ſlaves and Hottentots. The total value of every kind of colonial produce, exported in 4 years, from 1799 to 1802, amounts to 300,925 rix-dollars, or 60,185l. currency. From the above detail it appears, that the Cape of Good Hope is, in its preſent condition, of very little importance to any nation; conſidered with regard to its articles of exportation.

The goods imported from England into the Cape, in 4 years, from 1799 to 1802, conſiſted of woollen cloths, Mancheſter goods, hoſiery, haberdaſhery, and millinery, boots, ſhoes, and hats, cutlery, iron tools, ſtationary, bar and hoop iron, ſmiths' coals, houſehold furniture, paint and oils, earthen ware, naval ſtores, tongues, hams, cheeſe, and pickles; and from India and China were imported Bengal, Madras, and Surat piece-goods, tea, coffee, ſugar, pepper, ſpices, and rice. The Americans brought thither lumber, cargoes of deal plank, ſtaves, balk, ſalt-fiſh, pitch, turpentine, &c.; and the Danes, Swedes, and Hamburgh ſhips aſſorted cargoes of iron, plank, French wines, beer, gin, Seltzer water, coffee, preſerves, pickles, &c. in exchange for refreſhments, to defray the charges of repairs and other neceſſaries, or for hard money to carry to India or China. The whole importation into the Cape by Britiſh or foreign bottoms, from Europe, Aſia, and America, in 4 years, including the value of the prize goods brought in, and of the ſlaves imported within the ſame period, amounted to 5,977,535 rix-dollars 7 ſk. or 1,195,507l. 3s. 6d. currency.

When the Dutch Eaſt India company perceived their ſettlement extending far beyond the bounds which they had originally preſcribed, they found it expedient to divide the country into diſtricts, and to place over each a civil magiſtrate with the title of "Landroſt," who, with his council called "Hemraaden," was authoriſed to ſettle petty diſputes among the farmers, or between them and the native Hottentots, levy fines within a certain ſum, collect and apply the parochial aſſeſſments, and enforce the orders and regulations of government. His diſtrict was divided into a number of ſubdiviſions, over each of which was appointed a "Feldtwagtmeeſter" or country overſeer, whoſe duty was to take cognizance of any abuſes committed within his diviſion, and report the ſame to the landroſt, to adjuſt diſputes about ſprings, or water-courſes, and to forward the orders of government. The landroſt, however, had only the ſhadow of authority. The council and the country overſeers were compoſed of farmers, and were always more ready to ſkreen and protect their brother boors, accuſed of crimes, than to aſſiſt in bringing them to juſtice. The poor Hottentot had, therefore, little chance of obtaining redreſs for the wrongs he ſuffered from the boors. If he eſpouſed their cauſe, he became unpopular; and the diſtance from the capital was a ſufficient obſtacle to the preferring of complaints before the court of juſtice at the Cape, which itſelf had little influence in enforcing its orders in a part of the country diſtant 5 or 600 miles. Hence it happened that murders and the moſt atrocious crimes were committed with impunity; and the only puniſhment was a ſentence of outlawry for contempt of court, when the criminal did not appear to his ſummons, which ſentence was little regarded. This extenſive ſettlement is divided into 4 diſtricts; thoſe of the Cape, of Stellenboſch and Drakenſtein, of Zwellendam, and of Graaf Reynet, which ſee reſpectively.

When the Dutch government obtained, partly by purchaſe and partly by force, a tract of country from the Hottentots, it made grants of land to the ſettlers on four different tenures. The moſt ancient of theſe is that of "loan" lands; which were grants made to the original ſettlers of certain portions of land to be held on yearly leaſes, on condition of paying to government an annual rent of 24 rix-dollars. Every farm was to conſiſt of the ſame quantity, and to be ſubject to the ſame rent, without any regard to the quality of the land. This tenure amounted by renewals of the leaſe, at firſt made only for one year, to a leaſehold in perpetuity. The number of theſe loan-farms in the four diſtricts amounted in 1798 to 1832: and ſuppoſing each farm to conſiſt only of the uſual allowance, or a ſquare of 3 miles the ſide, the quantity of land in all theſe farms would amount to 10,552,320 acres, and the annual rent they produce is about 44,000 rix-dollars, or about $\frac{8}{10}$ths of a farthing per acre. The ſecond tenure was that of "gratuity" lands, which were originally granted in loan; but, on petition of the holders, in conſequence of ſome ſuppoſed ſervices done to government, they have been converted into a ſort of cuſtomary copy-hold liable to a certain rent, which, like the loan lands, is continued at 24 rix-dollars a year: the number of theſe eſtates is 107. The third tenure is that of "quit-rents," ariſing from pieces of waſte-ground, which, being contiguous or convenient to an eſtate, have been allowed by government to be occupied by the owners of ſuch eſtates upon a leaſe of 15 years, on condition of their paying an annual rent of one ſhilling per acre. The renewal on this payment is a matter of courſe.

Of ſuch grants there are 35. The fourth tenure is that of "real eſtates" held in fee-ſimple, and ſubject to no rent; and they are chiefly ſituated in the Cape diſtrict or its vicinity. Theſe are the choiceſt patches of land, and have been originally ſold or granted to the early ſettlers in parcels of about 60 morgen, or 120 Engliſh acres.

The 22,000 chriſtian inhabitants that compoſe the population of this colony may be diſtributed into four claſſes; viz. the people of the town, (See Cape *Town*), wine-growers, grain-farmers, and graziers. The wine-growers, or wine boors, occupy the beſt houſes and the moſt valuable eſtates; and are deſcendants of the French families who firſt introduced the vine. Theſe eſtates are moſtly freehold, in extent about 120 Engliſh acres, and moſtly employed in vineyards and garden-grounds. They bring their wine to market from September to the new vintage in March; and the deep ſandy roads over the Cape iſthmus require 14 or 16 oxen to draw 2 leggers of wine, whoſe weight is not 2½ tons. The wine brought to market is ſubject to a tax of 3 rix-dollars for every legger, and the brandy, paſſing the barrier, pays the ſame ſum. The wine or brandy, conſumed at home, or ſold in the country, is free of duty: nor are they ſubject to any parochial taxes or aſſeſſments, a ſmall capitation tax excepted. Theſe wine-farmers make their excurſions in their tent-waggons drawn by ſix or eight horſes. The corn-boors live chiefly in the Cape diſtrict and thoſe parts of Stellenboſch and Drakenſtein that are not more than two or three days' journey from the Cape; and are next in rank to the wine-boors. The grain, which they ſell in the country, is ſubject to no tax or tithe: but a duty, about one tenth of the value, is paid at the barrier for all grain paſſing towards Cape-Town. Their parochial aſſeſſments are the ſame as thoſe of the wine-boor. The coloniſts of the Cape are very bad agriculturiſts, and owe their crops more to the goodneſs of the ſoil and favourable climate than to their own ſkill or induſtry. Their plough is an unwieldy machine drawn by 14 or 16 oxen, which juſt ſkims the ſurface and does not penetrate the ſtiff ſoil. Such grounds, when ſown and harrowed, are infinitely more rough than the roughest lea-ploughing in England. They rarely give themſelves the trouble of manuring, except for barley. For returns of corn they generally reckon upon fifteen-fold, in choice places from 20 to 30, and more where they have the command of water. The grain is not threſhed, but trodden out in circular floors by cattle. The annual balance in favour of the farmer is about 143l. 13s. The graziers are thoſe of Graaf Reynet, and other diſtant parts of the colony. They are the leaſt advanced in civilization. The hovels in which they reſide have ſeldom more than two apartments, and frequently only one, in which the parents with ſix or eight children and the houſe Hottentots all ſleep. Their bedding conſiſts of ſkins. The walls of their hovels are formed of mud or clay baked in the ſun; they are ſometimes conſtructed with ſods and poles; and frequently a ſort of wattling plaiſtered over with a mixture of earth and cow-dung, both within and without; and they are rudely covered with a thatch of reeds, ſeldom water-proof. As to their clothing, the men generally wear a broad-brimmed hat, a blue ſhirt, and leather pantaloons, no ſtockings, but a pair of dried ſkin ſhoes. The women have a thick quilted cap that ties with two broad flaps under the chin, and falls behind acroſs the ſhoulders; a ſhort jacket and a petticoat, no ſtockings, and frequently they uſe no ſhoes. The bed for the maſter and miſtreſs of the family is an oblong frame of wood, ſupported on four feet, and reticulated with thongs of a bullock's hide, ſo as to ſupport a kind of mattreſs made of ſkins ſewed together, and ſometimes ſtuffed with wool. In winter they uſe woollen blankets. The bottoms of their chairs or ſtools are net-work of leather thongs. A large iron pot ſerves both to boil and broil their meat. They have neither linen for the table, nor knives, forks, or ſpoons. The boor carves with a large knife, which he carries in his pocket, for the reſt of the family. Their huts and their perſons are equally dirty, and their whole appearance betrays an indolence of body, and a low groveling mind. The women are greater drudges than the men, and yet they are not very induſtrious. Thongs cut from ſkins ſerve, on all occaſions, in lieu of ropes, and fibres cut from the tendons of wild animals are a ſubſtitute for thread. The folds or "kraals" in which they houſe their cattle at nights immediately front the doors of their huts; and as they are never cleaned out, they increaſe the filthineſs of their dwellings. Few of the diſtant boors have more than one ſlave, and many of them none; but the number of Hottentots, on an average, in Graaf Reynet, amounts to 13 to each family; and they are uſed with the moſt inexcuſable inhumanity. The produce of the graziers is ſubject to no kind of colonial tax. They pay only a ſmall parochial aſſeſſment proportioned to their ſtock; for every 100 ſheep a florin, or 16d., and for every ox or cow 1d. The condition of the farmers is ſuch, that each of them, upon a balance of his income and outgoings, ſaves annually 93l. 16s.

The revenues of the colony are derived from the following ſources; viz. land revenue ariſing from rents (already explained); places for grazing cattle taken by the month, and ſalt-pans; duties on grain, wine, and ſpirits, levied at the barrier; transfer duty on ſale of immoveable eſtates; duty ariſing from the ſale of buildings on loan farms; public vendue duty; fees received in the ſecretary's office on regiſtering the transfer of property; cuſtoms; port fees; poſtage of letters; ſeizures, fines, and penalties; licences to retail wine, beer, and ſpirituous liquors; intereſt of the capital lent out through the loan-bank; and duty ariſing from ſtamped paper. The whole amount of this revenue in 1801 was 90,142l. 13s. 4d. This revenue is applied to the payment of ſalaries on the civil eſtabliſhment, the expences of the ſeveral departments, the repairs of government buildings, and the contingencies and extraordinaries of the colony; and during the government of lord Macartney, when the Cape was in the poſſeſſion of this country, the revenue was more than adequate to the expenditure.

The members of the court of juſtice at the Cape are choſen out of the burghers of the town. The fiſcal, who is the public accuſer in criminal matters, and the ſecretary of the court, are the only perſons poſſeſſed of legal knowledge. The litigious ſpirit of the people, encouraged by the attornies who enter into the profeſſion without any knowledge of the law, multiplies cauſes; and the expences of a ſingle ſuit will ſometimes amount to 400 or 500l. ſterling, though the object of litigation was not worth 100l. The office of fiſcal, one of the moſt important in the colony, conſiſted of the principal and a deputy, a clerk, two bailiffs, two jailors, eight conſtables, and 19 blacks and Malays, uſually called "Kaffers." The whole expence to government was under 10,000 rix-dollars; the court of juſtice and ſecretary's office amounted to about the ſame ſum; ſo that the adminiſtration of juſtice coſt the government about 4000l. ſterling a year. The court of commiſſaries for trying petty ſuits (not exceeding 40l.) and for matrimonial affairs (or granting licences) conſiſts of a preſident, vice-preſident, and four members, whoſe ſituations are honorary and biennial. The "Weeſkammer," or chamber for managing the effects of minors and orphans is one of the original inſtitutions of the colony, and it is managed by a preſident and four members, a ſecretary and ſeveral clerks. For the ſupport of this inſtitution all orphan property, paſſing through the chamber, ſuffers a reduction of 7½ per cent. upon the capital.

The eſtabliſhed religion of the colony is Calviniſm, or the reformed church. Other ſects are tolerated; the Lutherans have a church; a methodiſt chapel has been lately built; the Moravians have a church; but the Malay Mahometans, being refuſed a church, perform their public ſervice in the ſtone-quarries at the head of the Cape town. The clergy are ſuitably provided for and generally reſpected in this country; and they rank next to the preſident of the court of juſtice in town, and the landroſt in the country. Beſides their clerical duties, they have alſo the direction of the funds for the relief of the poor; which are raiſed by weekly donations at church, by legacies, and by the ſums which the church demands on the emancipation of ſlaves. The amount of the funds belonging to the reformed church in Cape town, in 1798, were 22,168l. 8s. 8d., and the ſubſiſtence granted to the poor was 1112l. 17s. The funds of the Lutheran church were 14,829l. 13s. 2d., and the relief granted to the poor 194l. 9s. 2d.

Cape *diſtrict*, is the ſmalleſt, but the moſt populous, of the four diſtricts into which the ſettlement of the Cape of Good Hope is divided. It conſiſts of two parts; one, the peninſula on which the Cape Town is ſituated; the other, the ſlip of land extending from the ſhore of Table bay to the mouth of the Berg river in St. Helena bay, and ſeparated from Stellenboſch and Drakenſtein, on the eaſt, by the little Salt river, Deep river, and Moſſel bank river; being about 80 miles from north to ſouth, and 25 from eaſt to weſt, and containing about 2000 ſquare miles. The cape peninſula is about 30 miles in length, and 8 in breadth, or 240 ſquare miles. Of the Cape diſtrict there is not one-fifteenth part of the ſurface under any kind of tillage. The produce of the Cape peninſula is grapes, with all the European and many of the tropical fruits, vegetables of every deſcription, barley for the uſe of horſes, and a ſmall quantity of choice wine. The other parts of the Cape diſtrict furniſh wheat, barley, pulſe, and wine. The population of this diſtrict in 1797 amounted to 18,152 perſons, of whom 6261 were Chriſtians, and 11,891 ſlaves; of the Chriſtians or free people, 718 are perſons of colour, and 1000, nearly, are Europeans. By comparing the average number of deaths with the population, it appears that the mortality in the Cape diſtrict is about $2\frac{34}{100}$ in the hundred. That of the ſlaves is rather greater, but leſs, perhaps, than in any other country, where ſlavery is tolerated. The number of deaths on the average of 8 years, was 350, which is after the rate of 3 in 100. The quantity of land occupied amounted in conſequence of a meaſurement not very correct to 8018 morgen, or 16,036 acres; of which 580 morgen were employed in vineyards and gardens, and 3089 in grain. Capital crimes in this diſtrict are not ſo numerous as might be ſuppoſed among ſuch a mixed multitude, the great majority of which have no intereſt in the public proſperity or tranquillity. As to the natural produce of this diſtrict, it is of little or no importance, if we except the fiſheries. The collecting of ſhells for lime, and of heaths and other ſhrubby plants for fuel, furniſh conſtant employment for about 1000 ſlaves.

It has been generally aſſerted, that the Cape peninſula was originally ſeparated from the continent of Africa; and this opinion has been founded on a ſuppoſed retreat of the ſea. Mr. Barrow, on the contrary, apprehends that the ſea is gaining upon the land in Southern Africa; and adduces ſeveral facts in ſupport of this hypotheſis. From all the obſervations which he had an opportunity of making on the ſouthern coaſt of Africa he concludes, that the whole of L'Aguillas bank, ſtretching from Cape Point acroſs the entrance of Falſe bay to the mouth of Rio Infante or the great Fiſh river, and to the 37th parallel of ſouthern latitude, has at one time formed a part of the continent. It has been alleged indeed in favour of the Cape iſthmus having, at no long interval of time, been covered with the ſea, that ſea-ſhells have been found on the ſand that is accumulated on its ſurface. In reply to this argument Mr. Barrow obſerves, that whole ſtrata of theſe may be found in the ſides of the Lion's hill, many hundred feet above the level of the ſea; and theſe ſhells, he adds, have been conveyed to that ſituation not by the waves of the ocean, but by birds: and they are frequently found even on the very ſummit of the Table mountain.

Cape *Town*, the capital of the colony, is ſituated on the ſouth-eaſt angle of Table bay. The ſettlers ſeem to have choſen this ſpot for the ſite of the town for the convenience of water, which ruſhes in a plentiful ſtream out of the Table mountain. Saldanha bay would, in other reſpects, have been more ſuitable; as Table bay is faulty in every point that conſtitutes a proper place for the mart of ſhipping; and ſo boiſterous for four months in the year, as totally to prevent all ſhips from entering into it. The town is built with great regularity; the ſtreets being all laid out with a line. The houſes are generally white-waſhed, and the doors and windows painted green; they are moſtly two ſtories in height, flat-roofed, with an ornament in the centre of the front, or a kind of pediment; with a raiſed platform before the door having a hut at each end. It conſiſts of 1145 dwelling-houſes, inhabited by about 5500 whites and people of colour, and 10,000 blacks. The firſt claſs is compoſed of thoſe who fill the ſeveral departments of government, the clergy, the members of the court of juſtice, and of the police. The next are a ſort of gentry who, having eſtates in the country, retail the produce of them by means of their ſlaves: ſubordinate to theſe is a number of petty dealers, who call themſelves merchants; and, laſtly, the tradeſmen who carry on their ſeveral profeſſions by their blacks. Many of the people of colour are fiſhermen. The ſalaries of thoſe who are employed in the different departments of government, are ſo ſmall that moſt of them are petty merchants. The country boors employ a ſort of agents, who keep houſes to lodge them when they make their annual viſit to the town. Theſe are a kind of Jew brokers, who ſubſiſt by defrauding the ſimple boors in the diſpoſal of their property, and in the purchaſe of neceſſaries for them on their return. The emancipated ſlaves and people of colour are generally artificers; and many of them ſupport their families by taking fiſh, of which there are great plenty and variety in Table bay. Upon the whole, the people of the town are an idle diſſolute race of men, ſubſiſting chiefly on the labour of their ſlaves, who are required to bring them a certain ſum at the end of every week, and what they earn above this ſum belongs to themſelves, by means of which ſome of thoſe who are the moſt induſtrious have been enabled to purchaſe their own freedom, and ſometimes that of their children. The price of proviſions and that of labour bear no proportion. Butchers' meat is about 2d. a pound, and good brown bread, ſuch as the ſlaves eat, 1d. a pound. A common labouring ſlave gets from 2s. to 2s. 6d. a day, and a mechanic or artificer 5 and 6 ſhillings a day. The people of Cape Town are almoſt all of them petty dealers, and they have a remarkable propenſity for public vendues. Theſe vendues are a kind of lottery; in which a man buys in the morning a ſet of goods, which he again expoſes for ſale in the evening, ſometimes gaining, and ſometimes loſing by his bargains.

Such is the rage for theſe vendues, that in four ſucceſſive months of the year 1801, the amount of property ſold by public auction was 1,500,000 rix-dollars, a ſum equal to the whole quantity of paper money in circulation, which may be conſidered as the only money which has of late been circulated in the country. Houſe rent, fuel, and clothing are dear in the Cape-town; and yet there is no city or town in Europe, where the maſs of the people are better lodged or better clothed. Fire is leſs neceſſary here than in moſt parts of Europe. During the continuance of the ſouth-eaſt winds, reſembling in their effect the ſouth-eaſt Sirocco of Naples, the town appears to be deſerted. Every door and window are cloſed to keep out the duſt and the heat, both of which decreaſe with the continuance of the gale; the air gradually cools, and every ſmall pebble and particle of duſt in the courſe of 24 hours are carried into the ſea. The north-weſt winds of winter produce a moiſt and cold feeling, even in Cape-town, where, though the thermometer ſeldom deſcends below 40°, and then only about an hour before ſun-riſe, all the Engliſh inhabitants are glad to keep conſtant fires during the months of July, Auguſt, and September. Even in October it is not unuſual to obſerve the ſummits of the mountain to the eaſtward of the Cape iſthmus buried in ſnow. The number of marriages in Cape-town comprehending thoſe of the whole colony, for eight years, from 1790 to 1797 incluſively, amounted to 1449; that of chriſtenings to 2589; and that of burials to 1173: ſo that 1416 was the exceſs of chriſtenings above burials in that period. The inhabitants of Cape-town are burthened neither with taxes nor aſſeſſments. At the firſt eſtabliſhment of the colony a kind of capitation tax was levied under the name of "Lion and Tiger money," the produce of which was applied towards deſtroying beaſts of prey; but ſince theſe animals have become ſcarce in the vicinity of the Cape, the name of the aſſeſſment is changed, but the fund ſupplied by it has been appropriated to the repairs of the roads, ſtreets, water-courſes, and other public works. Its ordinary amount is about 5000 rix-dollars a year. Another aſſeſſment, chargeable on heads of families at the rate of 1s. 6d. a month, for every houſe or fire-place, is called "Chimney and hearth money," and amounts to about 5200 rix-dollars yearly. The inhabitants of Cape-town are ſubject to no tithes nor church-rates; but as the church provides for the poor, every perſon manumitting a ſlave pays to it 10l. giving ſecurity that ſuch ſlave ſhall not become burdenſome for a certain number of years. The police of the town is committed to the management of a board, conſiſting of ſix burghers, called the "Burgher Senate." The pleaſures of the inhabitants are chiefly of the groſſer kind, being thoſe of eating, drinking, and ſmoking: they have no taſte for public amuſements, and no exerciſe but that of dancing. In the whole town there is neither a bookſeller's ſhop, nor a book ſociety. Under the direction of the church is a library, left by an individual, and conſiſting of many excellent books; but very little uſed. Books are rarely found in Cape-town to conſtitute any part of the furniture of a houſe. Education is ſo little regarded, that neither government nor the church has been able to raiſe a ſufficient ſum for eſtabliſhing a proper public ſchool in the colony; and few of the natives are in circumſtances that allow of their ſending their children for education to Europe.

One of the greateſt nuiſances in Cape-town is the number of dogs that prowl about the ſtreets, particularly by night, when they quit their dens and lurking places in queſt of the offals of butchers' ſhops. Sometimes the wolves and hyænas deſcend from their dens in the Table mountain, and diſpute the ſpoil with the dogs: at ſuch times the town reſounds with their hideous howlings through the whole night. Soon after the Dutch Eaſt India company formed a ſettlement at the Cape, they found it neceſſary to build a fort for the protection of their own property and that of other ſettlers and alſo of their warehouſes againſt the attempts of the natives. As their trade increaſed, and the Cape became more frequented, it was deemed expedient to extend the works, and to erect a citadel that ſhould ſerve as a defence againſt any attack, either by land or by ſea. This citadel is the preſent caſtle, a regular pentagon fort, with two ravelins and ſome other outworks, and ſurrounded by a wet ditch: but it is ſo injudiciouſly ſituated, that though it commands the town and part of the anchorage, it is itſelf commanded by the ground riſing from it in a ſlope to the Devil's hill, which therefore renders it indefenſible. This ſlope is now occupied as high as the commencement of the perpendicular rocky ſide of the Devil's hill, by various redoubts, batteries, and block-houſes, commanding each other, and the advance ground to the caſtle, all of which were added by ſir James Craig, when the Cape was in the poſſeſſion of England. He alſo made ſome other important additions to the fortifications of this place. Fort Knokke is connected with the citadel by a rampart drawn along the ſhore, called the "ſea lines," defended by ſeveral batteries, mounted with heavy guns, and furniſhed with ovens for heating ſhot. Within theſe lines is a powder magazine and a long range of low buildings that were converted under the Engliſh government into a general hoſpital, with lodgings for the inſpector, ſtore-keeper, and apothecary to the forces. On the weſt of the bay are three ſtrong batteries, viz. the Rogge-bay battery, the Amſterdam battery, and the Chavonne battery, all the guns of which bear directly upon the anchorage. There is alſo a ſmall battery, called the "Mouille," commanding the entrance of the bay. A little farther, on a ſmall ſandy cove, a work is thrown up with a few light guns and a heating furnace, for preventing a landing at this place, which is further impeded by three anchors fixed acroſs the inlet. At Camp's bay, on the weſtern coaſt of the peninſula, there are alſo a few ſmall batteries, and a military poſt on the height above it, directly between the Table mountain and the Lion's head. An army landing here, and at Three Anchor Bay, might take the town and all the batteries in their rear, or, by a more important movement, might get poſſeſſion of the Lion's rump, from whence, with a few howitzers, the town and citadel, and the ſtrong batteries on the weſt ſide of Table bay, would be completely commanded. This hill has the very great advantage of not being commanded by any other point. Sir James Craig propoſed to erect a citadel on this eminence with ſuitable appendages and accommodations, if the Cape had remained in our poſſeſſion, which would, in his opinion, be ably defended in time of war by 1200 men; and would render the town, the batteries, and the caſtle, untenable by an enemy, all of which might be totally deſtroyed from this height in 24 hours.

Beſides the caſtle and the forts, the other public buildings of Cape town are a large well conſtructed barrack for 2000 men; a quadrangular building with an area in the centre, where the government ſlaves are lodged to the number of nearly 400; the reformed church, which is a ſpacious and neat ſtructure; the Lutheran church; the town-houſe; the court of juſtice; and a theatre. The Cape of Good Hope is ſituated in S. lat. 34° 29′. E. long. 18° 23′ 15″. The town is in S. lat. 33° 55′ 42″. E. long. 18° 23′ 15″. Barrow's Travels into the interior of Southern Africa, &c. vol. i. and ii.

Cape *Verd* and *Iſlands.* See Verd.

CAPE, in *Law*, a writ judicial, touching plea of lands and tenements; ſo termed, from the word which carries the chief intention or end of it.

Cape is of two kinds, the *magnum* and *parvum*; which in their effect are alike, as to the taking hold of things immoveable; though in certain circumſtances they differ: 1. In that the *cape magnum*, or *grand cape*, lies before; and the *cape parvum*, or *petit cape*, after appearance. 2. *Cape magnum* ſummons the defendant to anſwer the default; and alſo over to the demandant: *cape parvum* only to the default. It is called *petit cape*, not becauſe of its ſmall force; but becauſe contained in few words.

CAPE *magnum* is thus defined in the old Nat. Brev. 162. "Where a man hath brought a *præcipe quod reddat* of a thing that touches plea of land, and the tenant makes default of the day to him given in the original writ; then this writ ſhall be for the king to take the land into his hands: and if the tenant come not at the day given him by the writ, he loſes his land."

CAPE *parvum*, or *petit cape*, is thus defined, ibid. "Where the tenant is ſummoned in plea of land, and comes at the ſummons, and his appearance is recorded; and at the day given him, prays the view; and having it granted, makes default; then ſhall this writ iſſue for the king, &c." Reg. Jud. fol. 1. 2. Bract. l. 3. tract. 3. c. i. Fleta. l. 2. c. 44.

CAPE *ad valentiam*, a ſpecies of *cape magnum*, ſo called from the end to which it tends: it is thus deſcribed, "Where I am impleaded of lands, and I vouch to warrant another, againſt whom the ſummons *ad warrantandum* hath been awarded, and he comes not at the day given; then, if the demandant recover againſt me, I ſhall have a writ againſt the vouchee; and ſhall recover ſo much in value of the lands of the vouchee, if he has ſo much: otherwiſe, I ſhall have execution of ſuch lands and tenements as deſcend to him in fee; or, if he purchaſe afterwards, I ſhall have a re-ſummons againſt him; and if he can ſay nothing, I ſhall recover the value." Old. Nat. Brev. 161.

CAPE *du Batardeau*, in *Fortification*, the cap, upper part, or roof of the batardeau conſtructed on the ditch of a work at the ſaliant angle of the baſtion. There is commonly raiſed or erected on the middle of it a ſmall tower or turret, ſix or ſeven feet, to prevent deſertion.

CAPECE, SCIPIO, in *Biography*, an eminent Latin poet of Italy, was born of a noble family at Naples towards the beginning of the 16th century, and began his career as profeſſor of juriſprudence in the univerſity of his native city, but afterwards directed his attention to polite literature. His houſe was the reſort of learned men, who produced in 1535 "Commentaries on Virgil," attributed to Donatus. He firſt attracted notice as a poet by three books in praiſe of St. John the Baptiſt, entitled "De Vate maximo." But his fame was chiefly owing to his poem in two books, "De Principiis Rerum," firſt printed in 1542, and dedicated to pope Paul III.; in conſequence of which, Bembo and Manuzio did not ſcruple to compare him, though without ſufficient reaſon, with Lucretius. This poem, with a tranſlation and learned notes of the abbé Ricci, was reprinted, together with the other poems of Capece, who appears to have been living in 1561, at Venice, in 1754. Gen. Dict. Triaboſchi.

CAPEDUNCULA, in *Roman Antiquity*, the veſſels wherein the ſacred fire of Veſta was preſerved. See VESTALS.

CAPEL, in *Geography*, a town of Germany in the duchy of Carinthia, on the Fella; 10 miles S. of Volkemarck.

CAPELAN, in *Ichthyology*, a name given by writers to a kind of whiting called by the Venetians matlo, and by obſolete authors aſellus omnium minimus, and merlangus. This is moſt probably gadus minutus of the moderns, which Belon calls merlangus, and is the ſmalleſt of its tribe. The merlangus of Geſner is certainly too large for the capelan, and appears to be the ſame with our common whiting, GADUS MERLANGUS.

CAPELINE, in *Military Language*, a ſort of iron head-piece, or helmet, which the cavalry under John, duke of Bretagne, uſed to wear.

CAPELINE, in *Surgery*, a kind of bandage uſed by the French ſurgeons in caſes of amputations; conſiſting of a roller with two equal heads.

CAPELL, EDWARD, in *Biography*, one of the numerous editors and commentators of Shakeſpeare, was born in the county of Suffolk, and died in 1781. His edition of Shakeſpeare, in 1768, was compriſed in 10 volumes, ſmall 8vo. with an "Introduction" of ſingular compoſition, announcing another work, which was publiſhed in 1783, under the title of "Notes and various readings of Shakeſpeare; together with the ſchool of Shakeſpeare, or Extracts from divers Engliſh books, that were in print in the author's time, evidently ſhewing from whence his ſeveral fables were taken, &c. &c." Mr. Capell was the editor of a volume of ancient poems, called "Proluſions;" and the alteration of "Antony and Cleopatra," as acted at Drury-lane in 1758. See SHAKESPEARE.

CAPELL, in *Geography*, a town of Germany, in the duchy of Stiria; 3 miles N. of Muertznſchlag.

CAPELLA, in *Aſtronomy*, a bright ſtar of the firſt magnitude, in the left or preceding ſhoulder of the conſtellation AURIGA.

CAPELLA, MATIANUS MINEUS FELIX, in *Biography*, an African Latin writer, who flouriſhed about the year 470, and is ſuppoſed to have reſided at Rome. He is author of a work in nine books, which conſiſts of proſe and verſe intermixed, upon the ſeven liberal arts. The title of his work is "De Nuptiis Philologiæ et Mercurii."

Of all his nine books, no one has been much noticed by the moderns, except the ninth, which treats of muſic. The few Romans who expreſsly treated that ſubject, and the eager deſire of claſſical readers to obtain ſome knowledge of the means by which the ancients produced, by the power of modulated ſounds, thoſe miraculous effects which are recorded, not only by poets, but hiſtorians and philoſophers, drew particular attention on this part of the work.

The author's plan is the following.

Perſonifying Philology and Harmony, or Poetry and Muſic, under the character of Mercury and Harmonia, he deſcribes their union as a nuptial feaſt, at which Jupiter and all the heavenly hoſt of Paganiſm attend; celebrates as terreſtrial cultivators of muſic, Orpheus, Amphion, and Arion, who are admitted among the celeſtials to partake of the entertainment. And after going over the old ground in relating the wonders which muſic has performed, in healing diſeaſes, quelling ſeditions, tempering and bringing to reaſon the irregular affections of unruly youth, Harmonia is deſired by Apollo and Minerva to unfold the myſtery of her art.

We ſhall not enter on a diſquiſition concerning the Latinity of this work, which by many critics has been termed barbarous, but confine our reflections to the information which inquirers into the arcana of ancient muſic are likely to derive from its peruſal.

The author explains, by the mouth of Harmonia herſelf, the Greek ſcale of tones and ſemitones, giving Latin tranſlations of the Greek muſical terms, proceeding from *Proſlambanomenos*, the loweſt ſound in the general ſyſtem, and mounting

ing up to *Hyperbolæon, ultima excellentiam.* The next period treats of conſonances; then of modes; of ſingle ſounds, harmonical parts of the ſyſtem; of intervals, genera, keys, tetrachords; of the diapente and diateſſaron, or 5th and 4th; of tranſitions; of melopœia, rhythm, three kinds—the dactylic, iambic, and pæonian; and of ſix kinds of compound rhythm.

This ninth book, according to Meibomius, may be regarded as divided into two parts; the firſt containing the hiſtory of muſic, and its eulogium, the ſecond the theory and precepts of the art itſelf; and this laſt is what we ſhall chiefly conſider, as to its utility. And in mercy to inquirers after Greek muſic, or the muſic of the ancients in general, we can aſſure them, that what has been ſo long ſought in vain among the ſeven Greek theoriſts publiſhed by Meibomius, in Ptolemy, Plutarch, and Boethius, will not be found in Martianus Capella. His definitions are awkward Latin tranſlations of what may be found not only in Ariſtides Quintilianus, but in every Greek writer on muſic. He has not given us one of the characters of either Greek or Roman *notation;* nor is there, either in his encomia or definitions, a word that encourages a belief that the ancients knew any thing of ſimultaneous harmony, or *muſic in parts;* or even a trait of the arrangement of ſingle notes, to enable us to form any judgment of their melody. The rhythms, of which ſo many are mentioned, are thoſe of verſe, which probably were likewiſe thoſe of muſic.

He was the firſt from whom we received equivalents in Latin for the Greek muſical technica, and we find in his poetry many new metres, which we do not recollect to have ſeen in any other Roman poet. The learned work of Capella was firſt publiſhed by Vitalis, in folio, at Venice, in 1499, in a very incorrect ſtate. The corrections of Hugo Grotius at the age of 14 are among the wonders of literary hiſtory. They were publiſhed at Leyden in 1599.

Another Capella, who was a writer of elegy, is commemorated by Ovid, "De Ponto."

CAPELLE, in *Geography*, a town of France, in the department of the Straits of Calais, and diſtrict of Montreuil; 1 league S. of Heſdin.

Capelle, La, a town of France, in the department of Aiſne, and chief place of a canton in the diſtrict of Vervins; 4 leagues N.E. of Guiſe. The town contains 1,077, and the canton 14,097 inhabitants; the territory includes 187½ kiliometres and 18 communes.

Capelle-Marival, La, a town of France, in the department of the Lot, and chief place of a canton in the diſtrict of Figeac; 8 miles N.N.W. of Figeac. The place contains 1,013, and the canton 12,128 inhabitants: the territory comprehends 215 kiliometres and 20 communes.

CAPELLEN, a town of Germany, in the duchy of Stiria; 8 miles W. of Luttenburg.

CAPELLETTI, a Venetian militia, compoſed of ſoldiers that partly were ſlaves, Dalmatians, Albanians, and Morlachians, and were regarded as the choiceſt and beſt troops of the ſtate of Venice. They were much confided in by the Venetians, and were employed to guard their places of the greateſt importance, and amongſt others the palace and place of St. Marck at Venice.

CAPELLUTIUS, Reland, in *Biography*, a diſtinguiſhed phyſician and philoſopher, who flouriſhed in the latter part of the 15th century, under the pontificate of Paul II. publiſhed in 1490, "Chirurgia," printed at Venice in fol. and reprinted with additions in 1519 and 1546. It contains the whole body of ſurgery, collected principally from Albucaſis, and other Arabian writers. A poſthumous work of this writer was publiſhed at Franckfort in 1642, 8vo. reprinted in 1648, 4to. and again in 1682, 8vo.; "De Curatione Peſtiferorum Apoſtematum;" a practical work, much eſteemed. Haller. Bib. Chir. Eloy Dict. Hiſt.

CAPENA, or *Capinna*, Steph. Byz. in *Ancient Geography*, a town of Italy in Etruria, between the country of the Veii and the Tiber, according to Livy, who places the wood and temple of Feronia within its territory. Virgil alſo mentions this city, which was nearly N. of Rome.

Capena was alſo the name of one of the gates of Rome, now the gate of St. Sebaſtian, S.E of Rome.

CAPENSIS, in *Conchology*, a ſpecies of Anomia. The ſhell is longitudinally ſtriated, ſlightly truncated, with roundiſh crenated margin; flat valve, with a two-ſpined rib beneath. Chemn. Inhabits the Cape of Good Hope. Shell ſometimes reddiſh, ſometimes white.

Capensis, in *Entomology*, a ſpecies of Bombylius, that inhabits Africa, the wings of which are ſpotted with black; body greyiſh and black at the extremity. Linn.

Capensis, a ſpecies of Phalæna, (Bombyx) that inhabits Africa. The wings are pale red; on the anterior pair two flexuous ſtreaks, the poſterior of which is connected to a black one.

Capensis, a Linnæan ſpecies of Cicindela. This kind is ſomewhat braſſy, with white wing-caſes marked with a three-branched fuſcous line. Inhabits the Cape of Good Hope, and Calabria.

Capensis, a ſpecies of Cerambyx, found at the Cape of Good Hope. The general colour is black; thorax two-ſpined; four rufous bands on the wing-caſes; antennæ moderate.

Capensis, a ſpecies of Carabus, deſcribed by Thunberg as a native of the Cape of Good Hope. This is of a ferruginous colour, with a black longitudinal line on the thorax and ſuture of the wing-caſes.

*Obſ.* The abdomen in ſome ſpecimens is black; in others brown.

Capensis, in *Ornithology*, a ſpecies of Alauda, that inhabits the Cape of Good Hope. The three lateral feathers of the tail are tipped with white; chin pale yellow, edged with black; eye-brows yellow: *Cape lark*, Latham; *alauda capitis bonæ ſpei*, Briſſon; and *cravate jaune ou calandre du cap de bonne eſpérance*, Buffon. The bill is yellowiſh brown; upper part of the body with the tail brown; all the feathers darkeſt in the middle; chin orange; body beneath ochraceous; legs black; back claw rather hooked.

Capensis, a ſpecies of Anas, of a greyiſh colour, with cheſnut-coloured back, and ſpeculum ſpot on the wing pale greeniſh blue, edged with white.

This is the *cape wigeon* of Latham. The length is fifteen inches; bill red, black at the baſe; head ſpotted; legs reddiſh; claws black. Inhabits the Cape of Good Hope.

Capensis, a ſpecies of Alcedo. This has the tail long, and of a cinereous blue colour; beneath fulvous; breaſt teſtaceous; bill red. Gmel.

This bird inhabits the Cape of Good Hope. Its length is fourteen inches. The bill is blackiſh at the tip; head grey, inclining to tawny; body above blue green, inclining to aſh on the back; legs and claws red. Briſſon calls it *iſpida capitis bonæ ſpei;* and Buffon, *martin-pecheur du cap de bonne eſpérance.*

Capensis, a ſpecies of Certhia, that inhabits the Cape of Good Hope. The colour is fuſcous; tail-feathers blackiſh, the exterior ones fringed at the outer edges with white. Briſſon, &c.

CAPER-*bean*, in *Botany*. See Zygophyllum.

Caper-*buſh*. See Capparis.

Caper, or Caprus, in *Ancient Geography*, a river of

Aſia, in Syria, which flowed between the Lycus and Gorgus, and diſcharged itſelf into the Tigris. Ptolemy.—Alſo, a river of Aſia Minor, in Phrygia, and in the country of Cilaritis. Pliny ſays that it waſhed one of the ſides of Laodicea; and Strabo informs us, that it diſcharged itſelf into the Meander, near that city.

Caper, in *Navigation*, a veſſel uſed by the Dutch, for cruiſing and taking prizes from the enemy. In which ſenſe caper amounts to the ſame with privateer. Capers are commonly double officered, and crowded with hands even beyond the rates of ſhips of war, becauſe the thing chiefly in view is boarding the enemies.

CAPERNAUM, in *Ancient Geography*, a town of Paleſtine, ſituate on the north ſide of the ſea of Tiberias, called alſo the lake of Genneſareth and Sea of Galilee, at ſome diſtance weſt from the mouth of Jordan. Although it ſtood till the ſeventh or eighth century, its preciſe ſituation is quite loſt. According to St. Matthew, (iv. 13.) it was on the borders of Zabulon and Nephthali; and it was celebrated as the place where Chriſt dwelt after leaving his family at Nazareth, and where he performed many miracles, which occaſioned the woe denounced againſt its inhabitants for their infidelity. Capernaum was alſo the name of a river and of a mountain in the vicinity of the town. It had alſo a ſpring of clear and limpid water, which might probably induce the Jews, after their return from the Babyloniſh captivity, to build a city near it.

CAPEROLANS, in *Eccleſiaſtical Hiſtory*, a congregation of religious in Italy, ſo called from Peter Caperole their founder, in the 15th century. Caperole having by his enterprizing ſpirit and influence ſeparated the convents of Breſcia, Bergamo, and Cremona, from the province of Milan, a law-ſuit between the vicar-general and theſe convents enſued, which terminated in their favour. In 1475, pope Sixtus IV. erected them into a diſtinct vicariate under the title of that of Breſcia. Caperole afterwards induced the Doge of Venice to erect this vicariate into a congregation diſtinguiſhed by his own name. It ſtill ſubſiſts, and comprehends 24 convents, ſituate in Breſcia, Bergamo, and Cremona.

CAPES, or Capez, in *Geography*. See Gabs.

CAPESTANG, a town of France, in the department of Herault, and chief place of a canton, in the diſtrict of Beziers; 3 leagues N. of Narbonne. The place contains 1350, and the canton 5767 inhabitants; the territory comprehends $247\frac{1}{2}$ kiliometres, and 9 communes.

CAPET, Hugh, in *Biography*, the firſt king of France of the third race, was the ſon of duke Hugo, ſurnamed the Great, who, without wearing the crown, had for the beſt part of his life held the ſupreme power in France, and who died A. D. 955, by Hadwiga, or Avoya, of Saxony, daughter to Henry the Fowler, king of Germany, ſiſter to the emperor Otho the Great, and to Gerberg queen of France. Dante, in his "Purgatory," (Canto 20) in order to be revenged on prince Charles of Valois, ſprung from this prince, for drawing him from Florence, and confiſcating his property, when he headed one of the factions of the city, traduced his family by repreſenting him to be the ſon of a butcher. This ridiculous falſity has been adopted and circulated by ſeveral writers on the authority of Dante. Whereas his father was the ſon of king Robert, who fixed the Normans in France, brother-in-law to three kings, viz. Rodolph, Athelſtan, and Otho the Great, and deſcended by his mother from Charlemagne. As to the ſurname of "Capet," it was moſt probably a nick-name, ſignifying literally "jolterhead," and metaphorically, a "weak," or an "obſtinate" man. In the firſt of theſe ſenſes it was applied to Charles the Simple, and, perhaps, in the latter ſenſe, to this prince in his youth. At the death of his father he was 16 years of age, and he was particularly recommended to the care of Richard, duke of Normandy. When the line of Charlemagne, which had poſſeſſed the throne between 230 and 240 years, terminated with Lewis V. the laſt monarch of that line, Hugh Capet, who had ſerved him faithfully during his reign, ſucceeded him; the crown, as ſome writers aſſert, having been bequeathed to him by Lewis in recompence of his ſervices. However this be, upon the death of the king Hugh Capet took early and effectual meaſures for ſecuring the throne; as in a few days he cauſed himſelf to be proclaimed king at Noyon, and was ſolemnly crowned at Rheims, by the archbiſhop of that ſee, on the 3d of July, A. D. 987. This deſign was executed without oppoſition, nor did any perſon exert himſelf in behalf of the late king's uncle Charles, the laſt ſurviving prince of the race of Charlemagne. On his acceſſion, he added greater ſtrength to the crown than he received from it; ſince the duchy of France, the countries of Paris and Orleans, were in his own hands, and his brother-in-law, the duke of Normandy, was cloſely attached to his intereſt. His own queen Adelaide, who is ſaid to have been a princeſs of high birth and admirable qualities, contributed in no ſmall degree to his ſecurity. Having defeated an army raiſed by William duke of Guienne, in a ſhort but bloody battle near Poitiers, he compelled him to ſubmit; and being a man of good temper and ſagacity, as well as of great moderation, he aſſembled the nobles and propoſed to them the aſſociation of his ſon Robert. The propoſal being accepted, Robert was crowned with great ceremony on new-year's day, A. D. 988, at Orleans, by the archbiſhop of Sens. Having, by this act, ſecured the crown to his family, he never afterwards wore the royal ornaments, or affected any extraordinary ſtate or magnificence; but adminiſtered public affairs with great application, and with ſuch an appearance of modeſty, juſtice, and piety, as recommended him highly to his ſubjects, and more eſpecially to the clergy, to whom he reſtored all the abbies in his poſſeſſion; and his example was followed by the nobility. In the following year the adherents of Charles of Lorrain, after an unſucceſsful conteſt, did homage to the kings Hugh and Robert. The duke Lorrain remained, as long as he lived, a priſoner at Orleans; and with his ſon, who enjoyed the duchy of Lorrain, and who died without male iſſue, A. D. 991, the male line of Charlemagne was entirely extinct. In the ſequel of his reign, Hugh Capet ſtrengthened his government by mildneſs and moderation, and had the ſingular honour of eſtabliſhing a new family, and in ſome meaſure a new form of adminiſtration, without any remarkable circumſtances of violence, and without ſhedding blood. He died on the 24th of October, A. D. 997, in the 57th year of his age, and in the 8th of his reign, leaving his dominions in perfect tranquillity, and his ſon Robert in the peaceable poſſeſſion of the crown. His remains were interred in the church of the abbey of St. Denis. The deſcendants of Hugh Capet governed the kingdom of France, in a direct line from father to ſon, terminating with Charles IV. ſurnamed the "Fair," for eleven generations. There were thirteen monarchs in all, whoſe reigns together make upwards of 340 years, during which interval they wonderfully extended their authority as well as their dominions; and recovered, either to the crown or to the princes of the royal family, the better part of the ancient kingdom of France. They had alſo reduced the exorbitant power of the nobility within bounds, and were much leſs dependent upon the clergy than the monarchs of the ſecond race. Yet, after all, the nation was in low circumſtances; the frame of government far from being uniform;

form; and, in ſhort, the ſeeds of thoſe diſorders were very perceptible to diſcerning perſons, which, in the ſucceeding reign, ſprang up and became viſible to the whole world in their diſmal effects. Gen. Dict. Mod. Un. Hiſt. vol. xix. and xx.

CAPH, a Jewiſh meaſure of capacity, eſtimated by Kimchi at the 30th part of the log, by Arbuthnot at the 16th part of the hin, or 32d of the ſeah, amounting to five-eighths of an Engliſh pint. The caph does not occur in Scripture as the name of any meaſure.

CAPHAR, a toll, or duty, impoſed by the Turks on the Chriſtian merchants, who carry or ſend merchandiſes from Aleppo to Jeruſalem.

The caphar was firſt ſettled by the Chriſtians themſelves, when maſters of the Holy Land, for the ſupport of troops and forces poſted in the more difficult paſſes, to watch the Arabs, and prevent their pillages. But the Turks, who have continued, and even raiſed the toll, abuſe it; exacting arbitrary ſums of the Chriſtian merchants and travellers, on pretence of guarding them from the Arabs: with whom they yet frequently keep an underſtanding, and even favour their robberies.

Caphar, Heb. denoting a field or village, in *Ancient Geography*, is often uſed, in compoſition with other words, to ſignify a particular town or city. Thus, *Caphar-Aria*, a village of Paleſtine, between Jeruſalem and Aſcalon:—*Caphar-Barica*, or *Caphar Barucha*, a village of Paleſtine, 3 miles from Hebron, in the tribe of Juda, mentioned by Epiphanius and Jerome:—*Caphar-Dagon*, ſituate between Dioſpolis and Jamnia:—*Caphar-Nimra*, a populous town of Paleſtine, in the land of Iſrael:—*Caphar-Nome*, a village of Paleſtine, in Galilee, near Jordan:—*Caphar-Orſa*, a town of Idumæa, placed by Ptolemy to the weſt of Jordan:—*Caphar-Saba*, the ſite of *Antipatris*, which ſee:—*Caphar-Samala*, a place near Jeruſalem:—*Caphar-Sorek*, a town of Paleſtine, near Eleutheropolis, which exiſted in the time of Jerome.

CAPHARA, a town of Judah, in the tribe of Benjamin.

CAPHARATH, a fortified village of Galilee. Joſephus.

CAPHARCOTIA, or Caparcotia, a town of Paleſtine in Galilee, between Scythopolis and Cæſarea of Paleſtine.

CAPHAREUS, a promontory of the iſland of Eubœa, the doubling of which was reckoned very dangerous, in the infancy of navigation, on account of the rocks and whirlpools on that coaſt, much ſpoken of by the ancients. It is now called Capo d'Oro, Capo Chimi, and Capo Figera. On this coaſt the Grecian fleet was ſhipwrecked on its return from Troy with Agamemnon. To this purpoſe Virgil ſays (Æneid. l. xi. v. 260.):

> "Sit triſte Minervæ
> Sidus, et Euböica cautes, ultorque Caphareus."

CAPHAS, a mountain of Interior Libya, ſituated in that part of Africa which is about the 15th degree of N. latitude, and 25th degree of E. longitude, whence, according to Ptolemy, the river Daradus aroſe, ſuppoſed by ſome to be the preſent Senegal, and from which, it is conjectured, the Levant wind, called the Harmattan, proceeds. See Harmattan.

CAPHESA, or Capsa, a town of Africa, near the ſource of the river Magrada, ſurrounded by deſerts. Ptol. and Strabo.

CAPHIÆ, or Caphya, a town of Peloponneſus in Arcadia, N.W. of Orchomenus; it was built by Cepheus, and peopled from Attica. In this city were temples of Neptune and Diana. It ſuffered much from the enterpriſes of Cleomenes and the Achæan league. Near it was a fountain ſhaded by a plantain tree of extraordinary beauty, ſaid to have been planted by Menelaus, when he came into Arcadia to raiſe troops for his Trojan expedition. In the time of Pauſanias an antiquity of 1362 years was aſcribed to the tree. Pliny (l. xvi.) ſays, that it was planted by Agamemnon.

CAPHTOR, an iſland or diſtrict, concerning the ſituation of which Scripture interpreters have differed. Some have ſuppoſed, without ſufficient reaſon, that it was Cappadocia. Others are of opinion, that the iſland called Caphtor, from which ſprung the Caphtorim, Cherethites, or Philiſtines, who are thought to be people of the ſame origin, was the iſle of Crete in the Mediterranean. The abbé Pluche, Dr. Wells, and others, with greater probability, ſuppoſe Caphtor to have been one of the iſlands formed by the Nile in Egypt, and that it was the ſame with *Coptos*, which was ſo ſituated. To this purpoſe it is alleged, that the Caphtorim, mentioned Gen. x. 14. were deſcendants of Mizraim, the ſon of Ham, who peopled Egypt; and from them ſprung the Philiſtines.

CAPHURA, the ſame with *camphor*, which ſee.

CAPI-AGA, or Capi-Agassi, a Turkiſh officer, who is governor of the gates of the ſeraglio; or grand maſter of the ſeraglio. The capi-aga is the firſt dignity among the white eunuchs: he is always near the perſon of the grand ſignior: he introduces ambaſſadors to their audience: nobody enters, or goes out of the grand ſignior's apartment, but by his means. His office gives him the privilege of wearing the turban in the ſeraglio, and of going every where on horſeback. He accompanies the grand ſignior to the apartment of the ſultanas, but ſtops at the door without entering. His appointment is very moderate; the grand ſignior bears the expence of his table, and allows him at the rate of about ſixty French livres per day; but his office brings him in abundance of preſents; no affair of conſequence coming to the emperor's knowledge, without paſſing through his hand. The capi-aga cannot be baſhaw when he quits his poſt.

CAPIAS, in *Law*, a writ or proceſs, which is of two ſorts; one before judgment, in the court of C. P. called *Capias ad reſpondendum*, where an original is ſued out, &c. to take the defendant and make him anſwer the plaintiff. The other is a writ of execution after judgment, which is of various kinds; as, *Capias ad ſatisfaciendum*, *Capias pro fine*, *Capias utlagatum*, &c.

The *Capias ad reſpondendum* in C. B. is drawn from the "præcipe," which ſerves both for the "original" and "capias," and the return of the original is the teſte of the "capias." If a "capias" be ſpecial, in caſe, covenant, &c. the cauſe of action muſt be recited at large, and the ſubſtance of the intended declaration ſet forth, as alſo in the original. The "capias" is a writ commanding the ſheriff to take the body of the defendant, if he may be found in his baliwick or county, and to keep him ſafely, ſo that he may bring him to court, on the day of the return, to anſwer to the plaintiff of a plea of debt, treſpaſs, &c. In caſes of injury accompanied with force, the law, to puniſh the breach of the peace, and to prevent its diſturbance for the future, provided a proceſs againſt the defendant's perſon, in caſe he neglected to appear on the proceſs of attachment againſt his goods, or had no ſubſtance by which to be attached, ſubjecting by this writ his body to impriſonment. 3 Rep. 12. But the immunity of the defendant's perſon, in caſe of peaceable though fraudulent injuries, producing great contempt of the law in indigent wrong-doers, a "capias" was alſo allowed to arreſt the perſon in actions of "account," though no breach of the peace be ſuggeſted, by the ſtats. of Marlbridge, 52 Hen. III. c. 23. and Weſtm. 2. 13 Edw. I. c. 11.; in actions of "debt" and "detinue," by ſtat. 25 Edw. III. c. 17.; and in all actions "on the caſe," by ſtat. 19 Hen. VII.

c. 9. Before this laſt ſtatute a practice had been introduced of commencing the ſuit by bringing an original writ of treſpaſs, “quare clauſum fregit,” for breaking the plaintiff’s cloſe, “vi et armis;” which by the old common law ſubjected the defendant’s perſon to be arreſted by writ of “capias;” and then afterwards, by connivance of the court, the plaintiff might proceed to proſecute for any other leſs forcible injury. This practice (through cuſtom rather than neceſſity, and for ſaving ſome trouble and expence, in ſuing out a ſpecial original, adapted to the particular injury) ſtill continues in almoſt all caſes, except in actions of debt; though now, by virtue of the ſtatute above cited, and others, a “capias” might be had upon almoſt every ſpecies of complaint. It is now uſual in practice, to ſue out the “capias” in the firſt inſtance, upon a ſuppoſed return of the ſheriff (that the defendant, being ſummoned or attached, made default, or that he had no ſubſtance by which to be attached); eſpecially if it be ſuſpected that the defendant, upon notice of the action, will abſcond; and afterwards a fictitious original is drawn up, if the party is called upon ſo to do, with a proper return thereupon, in order to give the proceedings a colour of regularity. When this “capias” is delivered to the ſheriff, he by his under-ſheriff grants a warrant to his inferior officers, or bailiffs, to execute it upon the defendant. If the ſheriff of the county, in which the injury is ſuppoſed to be committed, and the action is laid, cannot find the defendant in his juriſdiction, he returns “non eſt inventus;” whereupon another writ iſſues, called a “teſtatum capias,” directed to the ſheriff of the county where the defendant is ſuppoſed to reſide, reciting the former writ, and that it is teſtified “teſtatum eſt,” that the defendant lurks or wanders in his bailiwick, wherefore he is commanded to take him, as in the former “capias.” But in a caſe of this kind alſo, it is uſual, for ſaving trouble, time, and expence, to make out a “teſtatum capias” at the firſt; ſuppoſing not only an original, but alſo a former “capias” to have been granted. This fiction, being beneficial to all parties, is readily acquieſced in, and is now become the ſettled practice. But where a defendant abſconds, and the plaintiff would proceed to an outlawry againſt him, an original writ muſt then be ſued out regularly, and after that a “capias.” And if the ſheriff cannot find the defendant upon the firſt writ of “capias,” and returns “non eſt inventus,” there iſſues out an “alias” writ, and after that a “pluries,” to the ſame effect as the former; only after theſe words, “we command you,” this clauſe is inſerted, “as we have *formerly*,” or “as we have *often* commanded you;” “*ſicut* alias, or *ſicut* pluries, præcipimus.” In the King’s-bench, the bill of Middleſex is a kind of “capias.” See Bill *of Middleſex*.

A “capias” is alſo uſed in criminal, as well as in civil, caſes. The proper proceſs on an indictment for any petty miſdemeanor, or on a penal ſtatute, is a writ of “venire facias,” which is in the nature of a ſummons to cauſe the party to appear. If by the return to ſuch “venire” it appears, that the party hath lands in the county, whereby he may be diſtrained, then a “diſtreſs infinite” ſhall be iſſued from time to time till he appears. But if the ſheriff returns that he hath no lands in his bailiwick, then (after his non-appearance) a writ of “capias” ſhall iſſue, which commands the ſheriff to take his body, and have him at the next aſſizes; and if he cannot be taken upon the firſt “capias” a ſecond and a third ſhall iſſue, called an “alias,” and a “pluries capias.” But on indictments for treaſon or felony, a “capias” is the firſt proceſs; and, for treaſon or homicide, only one ſhall be allowed to iſſue, or two in the caſe of other felonies, by ſtat. 25 Edw. III. c. 14.; though the uſage is to iſſue only one in any felony; the proviſions of this ſtatute being in moſt caſes found impracticable. Alſo, in the caſe of miſdemeanors, it is now the uſual practice for any judge of the court of King’s-bench, upon certificate of an indictment found, to award a writ of “capias” immediately, in order to bring in the defendant. But in this, and alſo in civil caſes, if he abſconds, and it is thought proper to purſue him to outlawry, greater exactneſs is neceſſary. Blackſt. Com. v. iii. 282, &c. v. iv. p. 318, &c.

Capias *ad ſatisfaciendum*, commonly termed CA. SA., is a writ of execution after judgment; lying where a man recovers in an action perſonal, as for debt, damage, &c. in which caſes, this writ iſſues to the ſheriff, commanding him to take the body of him againſt whom the debt is recovered; who is to be kept in priſon till he make ſatiſfaction.

It is uſual to take out this writ, where the defendant hath no lands nor goods, whereof the debt recovered may be levied: and when the body is taken upon a *Ca. Sa.* and the writ is returned and filed, it is an abſolute and perfect execution againſt the defendant, and no other execution can be had againſt his lands and goods. But this is unleſs the defendant eſcape, or die in execution, &c. for where a perſon dies in execution, his lands and goods are liable to ſatisfy judgment, by ſtat. 21 Jac. I. c. 24. Rol. Abr. 904. This writ does not lie againſt any privileged perſons, peers, or members of parliament; nor againſt executors or adminiſtrators (except on a “devaſtavit” returned by the ſheriff, 1 Lill. 250); nor againſt ſuch other perſons as could not originally be held to bail. It may be ſued out for coſts, againſt a plaintiff as well as a defendant, when judgment is had againſt him. If the defendant cannot be taken upon a *Ca. Sa.* in the county where the action is laid, there may iſſue a “teſtatum” *Ca. Sa.* into another county, and ſo of the other writs.

Capias *pro fine.* When judgment is given for the plaintiff, it is conſidered that the defendant be either amerced, for his wilful delay of juſtice in not immediately obeying the king’s writ by rendering the plaintiff his due; or be taken up, “capiatur” till he pays a fine to the king for the public miſdemeanor which is coupled with the private injury, in all caſes of force, of falſehood in denying his own deed, or unjuſtly claiming property in replevin, or of contempt by diſobeying the command of the king’s writ or the expreſs prohibition of any ſtatute. But now in caſe of treſpaſs, ejectment, aſſault, and falſe impriſonment, it is provided by 5 & 6 W. & M. c. 12., that no writ of “capias” ſhall iſſue for this fine, nor any fine be paid; but the plaintiff ſhall pay 6s. 8d. to the proper officer, and be allowed it againſt the defendant among his other coſts. And, therefore, upon ſuch judgments in the Common Pleas they uſed to enter that the ſame was remitted; and now in both courts they take no notice of any fine or “capias” at all. Blackſt. tom. v. iii. p. 398.

Capias *utlagatum*, a writ which lies againſt one outlawed upon any action, perſonal or criminal; by which the ſheriff is ordered to apprehend the party outlawed, for not appearing on the exigent, and keep him in ſafe cuſtody till the day of return; when he is to preſent him to the court, to be there further dealt with for his contempt: who, in the Common Pleas was formerly to be committed to the Fleet, and to remain there till he had ſued out the king’s pardon, and appeared to the action. By a ſpecial “Capias utlagatum” (againſt the body, lands, and goods in the ſame writ) the ſheriff is commanded to ſeize all the defendant’s lands, goods, and chattels, for the contempt to the king; and the plaintiff, (after an inquiſition taken thereupon, and returned into the exchequer) may have the lands extended, and a grant of the goods, &c. whereby to compel the defendant to appear; which when he doth, if he reverſe the outlawry, the ſame ſhall be reſtored to him. Old. Nat. Brev. 154. When a perſon is taken upon a "capias utlagatum," the ſheriff is to take an attorney's engagement to appear for him, where ſpecial bail is not required; and his bond with ſureties to appear, where it is required. Stat. 4. & 5. W. & M. c. 18. See Outlawry.

Capias *in Withernam.* See Withernam.

Capias *conductos ad proficiſcendum*, an original writ, which lies, by the common law, againſt any ſoldier who has covenanted to ſerve the king in war, and appears not at the time and place appointed. It is directed to two of the king's ſerjeants at arms, to arreſt and take him wherever he may be found: and to bring him *coram concilio noſtro*, with a clauſe of aſſiſtance.

CAPIATUR, *judgment quod.* See Capias *pro fine.*

CAPIBARA. See Capybara.

CAPICULY, formerly called Janizaries, the firſt and beſt corps or body of the Turkiſh infantry.

CAPIDAVA, in *Ancient Geography*, a town of Lower Mœſia, between Axiopolis and Carſon. Antonin. Itin.

CAPIDODIUS, in *Zoology*, a name given by Paulus Jovius, and ſome other obſolete writers, to an animal of the cetaceous tribe (or fiſh as they deſcribe it) diſtinguiſhed by having the ſnout bending upwards, and armed with broad ſerrated teeth. The ſpecies implied is certainly Delphinus Orca of Linnæus and later authors.

CAPIDOLIA, in *Zoology*, a ſynonym of Balæna Musculus.

CAPIGI, or Capidgi, a porter, or door keeper of the Turkiſh Seraglio. There are about five hundred capigis, or porters, in the Seraglio, divided into two companies; one conſiſting of three hundred, under a chief called *Capigi-Baſſa*, who has a ſtipend of three ducats per day; the other conſiſts of two hundred, diſtinguiſhed by the name of *Cuccicapigi*, and their *chief Cuccicapigi-Baſſa*, who has two ducats. The capigis have from ſeven to fifteen aſpers per day; ſome more, others leſs. Their buſineſs is to aſſiſt the janizaries in the guard of the firſt and ſecond gates of the Seraglio; ſometimes all together; as when the Turk holds a general council, receives an embaſſador, or goes to the moſque; and ſometimes only in part; being ranged on either ſide to prevent people entering with arms, any tumults being made, &c. The word, in its original, ſignifies *gate.*

CAPIGIS-*bachis*, or Capidgis-*bachis*, a ſort of chamberlains belonging to the grand ſignior whoſe place is honourable and lucrative, and who are charged to execute the orders which they receive from the ſultan, e. g. to cut off the head of a rebel or extortioner, to carry the news of the appointment to a government, to go and collect the ſucceſſions of the great officers of the empire, &c.; their chief, always taken from this claſs, is called "Mir-alem." The capidgis-bachis are ſometimes raiſed to the dignity of pacha or baſhaw with two tails, and go in that quality to govern the province which is allotted to them.

CAPILLAIRE, a ſyrup made of maiden-hair. See Adiantum and Asplenium.

CAPILLAMENT, literally ſignifies *hair*, being formed of the Latin *capillus*, of *caput*, q. d. *hair of the head.* Hence the word is figuratively applied to ſeveral things, which, on account of their length, or their fineneſs, reſemble hairs: as,

Capillaments *of the nerves*, the fine fibres, or filaments, whereof the nerves are compoſed.

Capillament, in *Botany*, a term uſed by the old botaniſts for the filament of the ſtamen. Bradley ſeems to reſtrain *capillaments* to the ſmaller flowers; and *ſtamina* (which he corruptly calls *apices*) to the larger.

Capillament is alſo applied to the ſtrings or threads about the roots of plants.

CAPILLARES, a name given by ſome of the old botaniſts to the ferns, becauſe, according to Mr. Ray, they ſtrengthen and improve the human hair; or, according to others, from a curious fancy that they grow from the earth without ſtems, in the ſame manner as hairs grow from the human head.

CAPILLARIS, or Capillata, *Arbor*, an ancient tree at Rome, on which the veſtal virgins, when ſhaven for their office, hung up their hair, and conſecrated it to the gods.

CAPILLARY, of the Latin *capillus*, a *hair*, is applied to ſeveral things, to intimate their exceeding ſmallneſs or fineneſs, reſembling that of a hair.

Capillary is alſo uſed by *Mineraliſts* in ſpeaking of ores which ramify or ſhoot out fine branches like threads.

In which ſenſe it amounts to the ſame with what is otherwiſe called *arboreſcent* and *ſtriated.* Woodward ſpeaks of capillary or arboreſcent ſilver and iron; Grew deſcribes a piece of pure capillary copper from the mine of Heragrunt, the ſeveral ſtriæ or capilli of which are ſhort, of a reddiſh golden colour, growing together almoſt like thoſe of the little ſtone-moſs.

Capillary *roots.* See Fibrose *roots.*

Capillary *tubes*, in *Phyſics*, are thoſe which are very ſmall, or whoſe canals are ſo narrow, as by the diminutive ſize of their bores to reſemble a hair in diameter. The uſual diameter of capillary tubes is a half, third, or fourth of a line, or from $\frac{1}{20}$th to $\frac{1}{50}$th of an inch: though Dr. Hook aſſures us he drew tubes in the flame of a lamp much ſmaller, and almoſt as fine as the thread of a cobweb.

The aſcent of fluids in tubes of this kind is a phenomenon which has been noticed by philoſophers, and of which different accounts have been given. The fact is unqueſtionable; for if one end of a ſmall tube, open at both ends, be immerged in water, the liquor within the tube will riſe to a ſenſible height above the external ſurface; or if two or more tubes be immerged in the ſame fluid, e. g. water, one of them a capillary one, and the other conſiderably larger, the water will riſe perceptibly much higher in the former than in the latter; in the reciprocal ratio of the diameters of the tubes: and the effect is the ſame in vacuo as in the open air.

The greateſt height to which Dr. Hook ever found water to aſcend above the level of the baſon, in his very ſmall capillary tubes, did not exceed 21 inches. See Ascent *of fluids.*

For the illuſtration of this phenomenon, we may obſerve in general, that the particles of water and of other fluids mutually attract each other; and that there is alſo an attraction between glaſs and water, &c. which is increaſed by cold, and diminiſhed by heat, but which is, *cæteris paribus*, proportional to the ſurface of contact. The mutual attraction of particles of water is evinced by the globular forms of the drops of this fluid, by their coaleſcing when brought near one another, and by a variety of other phenomena. It is obſerved alſo, that if we breathe on a glaſs plate, the breath will adhere to it longer in cold, than in hot weather. If a drop of water be laid upon glaſs, the ſurface moſt remote from the glaſs will retain a convex form, whilſt that which touches it will adapt itſelf to the ſurface of the glaſs, and adhere to it with a certain degree of force; but if the ſame drop be ſpread over the ſurface of the glaſs, it will loſe its convex ſurface, and adhere to the glaſs with a greater force.

By this diſperſion of its particles they will be removed farther from each other, and their mutual attraction will be diminiſhed; whereas, on the other hand, the attraction between the water and the glaſs is increaſed by enlarging the ſurface of contact. In either of theſe caſes, the water is attracted by the glaſs only on one ſide; but if another piece of glaſs be placed in oppoſition to the former, and in contact with the film of water, the water will be attracted and retained with a greater force; and if the water be on every ſide encompaſſed with glaſs, or encloſed in a narrow tube, the attraction will become ſtronger, becauſe the ſurface of contact in proportion to the quantity of water is thus conſiderably enlarged. The truth of theſe obſervations may be evinced in the following manner. Put water into a glaſs veſſel, (*Plate* I. *Hydroſtatics*, *fig.* 1.) and the water near the ſurface of the glaſs will aſcend, and form a curve, as at A and B; or the ſame effect will be exhibited at C and D, by dipping part of a piece of glaſs in the water. In order to explain this effect, let A B, (*fig.* 2.) repreſent a ſection of the ſurface of a piece of glaſs, the lower part of which is immerſed in the water, B C: and ſuppoſe this ſurface to be divided into a number of indefinitely ſmall parts, *a*, *b*, *c*, *d*, &c.; then the part *a*, next to the ſurface of the water, B C, will raiſe a quantity of water proportional to its attractive force; which quantity is thus brought nearer to the part *b* of the glaſs, and attracted by it, ſo that another quantity of water takes its place next to *a*. The firſt quantity of water being raiſed to *b*, is brought nearer to the part *c* of the glaſs, and being attracted by it, is raiſed to the place *c*, whilſt the firſt quantity of water *a*, takes its place, which is ſucceeded by another quantity of water which riſes to the place *a*; ſo of the others. In conſequence of this attraction, the water ought to form a film of equal thickneſs, or the quadrilateral figure, *g*, *h*, *a*, *s*, on the whole ſurface of the glaſs. But by reaſon of the mutual attraction of the particles of water towards each other, when the firſt quantity of water has been raiſed to the place *a*, another quantity of water *s*, is kept ſuſpended by this latter attraction, between the water at *a*, and that at B C. When the glaſs has by its attraction raiſed the water to *b*, the part *s* will be extended to *t z*, becauſe the two quantities of water, *a* and *b*, can keep ſuſpended a greater portion of water than the ſingle part *a*. Thus, the water will aſcend along the ſurface of the glaſs, and will remain adhering to it, in ſuch quantity as to form a counterpoiſe to the attraction of the glaſs; or, in other words, the preſſure of the water thus raiſed, and the attraction between it and the water, B C, will form by their united actions a counterpoiſe to the attraction of the glaſs. The real aſcent of the water, which, in the figure we have referred to, has been enlarged for the better illuſtration of the ſubject, ſeldom exceeds $\frac{1}{10}$th of an inch, when the glaſs is either flat, or not much bent. But this altitude is increaſed by a variety of circumſtances; viz. by the temperature and purity of the water, by the quality of the glaſs, and chiefly by the poliſh and cleanlineſs of its ſurface.

In ſmall tubes of different diameters, the perpendicular aſcent of water, and of various other fluids, will be inverſely as their reſpective diameters. Thus, if glaſs tubes opened at both ends be immerſed with their lower apertures in water, (ſee *fig.* 3.) the water will inſtantly riſe ſpontaneouſly into their cavities; and it has been found to riſe higher and with a greater velocity in narrower than in large tubes, according to the proportion in which the diameters of the larger tubes exceed thoſe of the ſmaller; and the altitude in a tube of $\frac{1}{100}$th part of an inch, (viz. 0.01), in diameter, will be about 5.3 inches. Conſequently, in a tube of 0,02 in diameter, the altitude of the water will be the half of 5.3, viz. 2.65 inches. Alſo, in a tube whoſe diameter is 0.1 of an inch, or 10 times 0.01, the altitude of the water will be the 10th part of 5.3, or 0.53 of an inch, &c. Hence it follows, that if we call the diameters of the tubes D, *d*, and the altitudes of the water A, *a*, we ſhall have, $D : d :: a : A$, and $A D = a d$; that is, the product of the diameter by the altitude of the water is always the ſame, or the conſtant quantity 0.053 of an inch; for when the diameter is 0.01 of an inch, the water riſes to the altitude of 5.3 inches; and $5.3 \times 0.01$ is equal to $0.053 = 0.02 \times 2.65 = 0.1 \times 0.53$. If, therefore, you wiſh to know how high the water will riſe in a tube of a given diameter, it is only neceſſary to divide 0.053 by the diameter, and the quotient expreſſes the altitude in inches, very nearly; for allowance muſt be made for difference of temperature, the nature and cleanlineſs of the glaſs, &c. which influence the altitude. Moreover, ſince the ſurface of a cylinder is as the product of the diameter multiplied by the axis, or the altitude, and it has been already ſhown, that in the part of the tube occupied by the water, the product of the diameter by the altitude is a conſtant quantity, the ſurface of the glaſs which is in contact with ſuch a pillar of water, is likewiſe a conſtant quantity.

Mr. Atwood, in his "Analyſis," has given the following method of very accurately determining the diameter of a capillary tube. Put into the tube ſome mercury, whoſe weight in grains is $w$, and let it occupy a length of the tube $l$; then, if 13.6 be the ſpecific gravity of mercury, as it is when in its pureſt ſtate, that of water being 1, the diameter will be $= \sqrt{\frac{w}{l}} \times .01923$. For let $d$ be the diameter, and the contents of the mercury will be $= d^2 l \times .7854$; and as one cubic inch of mercury weighs 3443 grains, we have $1 : 3443 :: d^2 l \times .7854 : w$; hence we ſhall have $d^2 l \times .7854 \times 3443 = w$, and $d^2 = \frac{w}{l} \div .7854 \times 3443 = \frac{w}{l} \div 2704.1322$; and $d = \sqrt{\frac{w}{l}} \div \sqrt{2704.1332} = \sqrt{\frac{w}{l}} \times \frac{1}{\sqrt{2704.1332}} = \sqrt{\frac{w}{l}} \times .01923$.

Several ingenious perſons, who, in examining the phenomena of capillary attraction, have found that the bulks of the ſuſpended pillars of water are not proportional to the ſurfaces of glaſs with which they are in contact, have been embarraſſed in explaining them; and for this purpoſe they have adopted various hypotheſes. Some have ſuppoſed that the unequal preſſure of the air upon the liquor contained in the tube and that in the veſſel is the cauſe of the aſcent in the tube. In order to account for this inequality, ſome have had recourſe to the magnitude of the particles of the air and of the aſcending fluid; others have conceived, that only an inverted cone of air, touching the ſurface of the liquor in the tube with its vertex, and having the upper orifice of its tube for its baſe, could preſs upon the ſurface contiguous to its vertex. Dr. Hook ſuppoſed that part of the preſſure of the air in the tube was taken off by its friction, which he apprehends muſt neceſſarily happen againſt the ſides in ſo narrow a paſſage; and this hypotheſis of Dr. Hook was for a long time very generally received. Thoſe who wiſh to ſee his explication of it may find it in the ſixth Obſervation of his "Micrography," or in Cotes's Hydroſtatical and Pneumatical lectures, *(ubi infra.)* But ſince it has been obſerved, that the ſame aſcent of liquors in capillary tubes occurs in vacuo as in the open air; this hypotheſis of an inequality of preſſure has been relinquiſhed; and the ſolution of the difficulty has been ſought for in the mutual attraction of the particles of fluids and thoſe of glaſs. Mr. Hawkſbee, and others, have recourſe to the attraction of the annuli of the concave ſurface of the tube. Dr. Jurin (Phil. Tranſ. N° 355, and N° 363, or Abr. vol. iv. p. 423, &c.) aſcribed the ſuſpenſion of the water to the attraction of the ſmall annular portion, or periphery of the inſide of the tube, to which the upper ſurface of the water is contiguous and adheres; this being the only part of the tube, from which the water muſt recede upon its ſubſiding, and conſequently, the only one which, by the force of its coheſion and attraction, counteracts the gravity of the water, and oppoſes its deſcent. This he ſhews to be a cauſe proportional to the effect; becauſe the periphery, and the ſuſpended column, are both in the ſame proportion as the diameter of the tube. The ſuſpenſion being thus accounted for, the ſeemingly ſpontaneous aſcent will be eaſily ſolved: for ſince the water that enters the capillary tube, as ſoon as its orifice is dipped in it, has its gravity taken off by the attraction of the periphery, with which its upper ſurface is in contact, it muſt neceſſarily riſe higher; partly by the preſſure of the ſtagnant water, and partly by the attraction of the periphery, immediately above that which is already contiguous to it. Dr. Hamilton, (Lect. ii. p. 47, &c.) diſſatiſfied with the principle adopted by Dr. Jurin and others, ſuppoſes that the pillar of water is ſupported by the attraction of the annulus contiguous to the bottom of the tube. Accordingly, he obſerves, that when the orifice of a ſmall glaſs tube, open at both ends, is dipped in water, the ſmall annular ſurface of glaſs, on the inſide of the tube contiguous to the orifice, will draw up the water lying immediately under it, and every plate of water elevated will raiſe up that lying above it, until the weight of the column raiſed counterbalance the force by which this annulus endeavours to draw up more water. The thin plate of water lying over the loweſt annulus, and every other plate of the elevated water, muſt be attracted upwards and downwards with equal forces, becauſe the attracting ſurfaces above and below it are equal; and therefore the whole column of water, lying above the loweſt annulus, being drawn equally in oppoſite directions, may be conſidered as unaffected by the attraction of the glaſs, and muſt preſs with its whole weight on the water retained at the orifice of the tube by the attraction of that loweſt annulus, which has no other ſurface below it to counteract its force. Moreover, when the water has aſcended into a ſmall glaſs tube, open at both ends, take it up, and wiping off the drop hanging at the end of it, invert the tube: the ſmall column of included water, being drawn equally by the glaſs in oppoſite directions, will deſcend by its own gravity, or ſtop only when it arrives at the loweſt orifice. Or, whilſt the included column is deſcending, let the loweſt orifice be dipped in water, and taken up, and a ſmall plate of water will be retained at its orifice, and then the included column will be quieſcent. Now this column muſt, by means of the intermediate air, preſs with its whole weight upon the plate of water at its orifice, which can be retained by no other force than the attraction of the glaſs annulus, lying juſt within the orifice of the tube. From hence it appears, ſays Dr. Hamilton, that this attraction alone is ſufficient to ſuſtain, and conſequently to raiſe all the water that riſes in glaſs tubes. Againſt this reaſoning Mr. Parkinſon, *(ubi infra)* has alleged the following experiments. 1. Let a cylindrical glaſs tube be divided into very ſmall equal annuli, *a*, *b*, *c*, *d*, *e*, &c. (*fig.* 4.) and *a* being dipped in water, a thin plate of the fluid will be detached from the maſs, which being now in contact with the ſecond annular ſurface *b*, poſſeſſing the ſame power of attraction with *a*, muſt, partly at leaſt, be raiſed by it; and the caſe will be the ſame with the remaining annuli. And if the efforts of the intermediate annuli ſhould be equal and oppoſite, which cannot be allowed, yet the ſuperior annulus at *g*, would be unaffected, and its whole force remain entire, and it muſt contribute, at leaſt, towards the ſupport of the column of water. But that each annulus ſhould exert a force in elevating the lamina of fluid contiguous to it, and not contribute towards the ſupport of the fluid thus elevated, is unaccountable; the power of attraction being inherent in the glaſs, and inſeparable from it. 2. Let the orifice, F, of the compound tube, E D F, (*fig.* 5.) be dipped in water, and it will riſe to an altitude equal to *g b*; and if D F be filled, ſo that the fluid be not in contact with the narrower part, it will ſubſide till its height be equal to *g b*. But let the tube be filled ſo that the fluid be admitted into the narrower part at D, the height of the column ſuſpended will be equal to *a f*, though the loweſt annulus continues the ſame. When this tube is inverted, and the orifice, E, dipped in the fluid, it riſes to an altitude equal to *a f*, if the narrower part of the tube be ſo long; and if E D be leſs than *b g*, it riſes into the wider tube till its height be equal to *b g*, the ſame altitude as if the tubes were cylindrical, and its diameter equal to that of the wider. If theſe experiments be true, it is clear that the water, riſing ſpontaneouſly in glaſs tubes, is neither raiſed nor ſupported by the attraction of the loweſt annulus.

Others have maintained, and this opinion ſeems to be the moſt unexceptionable, that the attraction is proportional to the whole ſurface of the glaſs which is in contact with the column of water; for every point or particle of that ſurface poſſeſſes an equal attractive power; and the preſſure of the ſuſpended water is equivalent to it, or the one is a counterpoiſe to the other. This influence of glaſs, and other ſubſtances, upon fluids is ſcarcely perceptible beyond the immediate points of contact; nevertheleſs, it is clear, that a film of water of a certain thickneſs muſt be within the extent of that attractive power all round the inner ſurface of the tube, as high as the top of the pillar; but the reſt of the water, which fills up the cavity of the tube, is attracted to that film, and is kept ſuſpended by it, in conſequence of the mutual attraction of the particles of water: yet the whole column is kept up by the attraction of the glaſs, and is a counterpoiſe to that force. Let water be kept ſuſpended in the cylindrical glaſs tube, A B C D, (*fig.* 6.); and let the attraction of the glaſs extend to the lines, E G, F H; and circles of the fluid, whoſe breadths are *m n*, *r s*, &c. will adhere to the ſurface, and certainly be ſupported by the immediate attraction of the glaſs, which is ſo great, that water ſuſpended in a capillary tube will not evaporate, though expoſed to the air for ſix or ſeven months: but the intermediate column, E G H F, is only ſupported by the adheſion of the particles of the fluid to theſe circles, and to the higheſt lamina, G H; the attraction of any intermediate lamina, L M, being the ſame both upwards and downwards; and when the weight of this intermediate column exceeds their accumulated force, it muſt deſcend. This ſeems to be certain, that the ſhell of particles, C E F D, is ſuſtained by the intermediate action of the glaſs, which is diffuſed to the intermediate lamina, *n p*, *s t*, &c. by the coheſion of the particles themſelves; and in this manner the forces of the oppoſite points, *m*, *q*, and *r*, *v*, conſpire, which does not obtain in the forces of the particles upon the outſide of the tube; and this ſeems to be the reaſon why a column of the fluid is not elevated

By this diſperſion of its particles they will be removed farther from each other, and their mutual attraction will be diminiſhed; whereas, on the other hand, the attraction between the water and the glaſs is increaſed by enlarging the ſurface of contact. In either of theſe caſes, the water is attracted by the glaſs only on one ſide; but if another piece of glaſs be placed in oppoſition to the former, and in contact with the film of water, the water will be attracted and retained with a greater force; and if the water be on every ſide encompaſſed with glaſs, or encloſed in a narrow tube, the attraction will become ſtronger, becauſe the ſurface of contact in proportion to the quantity of water is thus conſiderably enlarged. The truth of theſe obſervations may be evinced in the following manner. Put water into a glaſs veſſel, (*Plate* I. *Hydroſtatics*, *fig.* 1.) and the water near the ſurface of the glaſs will aſcend, and form a curve, as at A and B; or the ſame effect will be exhibited at C and D, by dipping part of a piece of glaſs in the water. In order to explain this effect, let A B, (*fig.* 2.) repreſent a ſection of the ſurface of a piece of glaſs, the lower part of which is immerſed in the water, B C: and ſuppoſe this ſurface to be divided into a number of indefinitely ſmall parts, *a*, *b*, *c*, *d*, &c.; then the part *a*, next to the ſurface of the water, B C, will raiſe a quantity of water proportional to its attractive force; which quantity is thus brought nearer to the part *b* of the glaſs, and attracted by it, ſo that another quantity of water takes its place next to *a*. The firſt quantity of water being raiſed to *b*, is brought nearer to the part *c* of the glaſs, and being attracted by it, is raiſed to the place *c*, whilſt the firſt quantity of water *a*, takes its place, which is ſucceeded by another quantity of water which riſes to the place *a*; ſo of the others. In conſequence of this attraction, the water ought to form a film of equal thickneſs, or the quadrilateral figure, *g*, *h*, *a*, *s*, on the whole ſurface of the glaſs. But by reaſon of the mutual attraction of the particles of water towards each other, when the firſt quantity of water has been raiſed to the place *a*, another quantity of water *s*, is kept ſuſpended by this latter attraction, between the water at *a*, and that at B C. When the glaſs has by its attraction raiſed the water to *b*, the part *s* will be extended to *t z*, becauſe the two quantities of water, *a* and *b*, can keep ſuſpended a greater portion of water than the ſingle part *a*. Thus, the water will aſcend along the ſurface of the glaſs, and will remain adhering to it, in ſuch quantity as to form a counterpoiſe to the attraction of the glaſs; or, in other words, the preſſure of the water thus raiſed, and the attraction between it and the water, B C, will form by their united actions a counterpoiſe to the attraction of the glaſs. The real aſcent of the water, which, in the figure we have referred to, has been enlarged for the better illuſtration of the ſubject, ſeldom exceeds $\frac{1}{10}$th of an inch, when the glaſs is either flat, or not much bent. But this altitude is increaſed by a variety of circumſtances; viz. by the temperature and purity of the water, by the quality of the glaſs, and chiefly by the poliſh and cleanlineſs of its ſurface.

In ſmall tubes of different diameters, the perpendicular aſcent of water, and of various other fluids, will be inverſely as their reſpective diameters. Thus, if glaſs tubes opened at both ends be immerſed with their lower apertures in water, (ſee *fig.* 3.) the water will inſtantly riſe ſpontaneouſly into their cavities; and it has been found to riſe higher and with a greater velocity in narrower than in large tubes, according to the proportion in which the diameters of the larger tubes exceed thoſe of the ſmaller; and the altitude in a tube of $\frac{1}{100}$th part of an inch, (viz. 0.01), in diameter, will be about 5.3 inches. Conſequently, in a tube of 0,02 in diameter, the altitude of the water will be the half of 5.3, viz. 2.65 inches. Alſo, in a tube whoſe diameter is 0.1 of an inch, or 10 times 0.01, the altitude of the water will be the 10th part of 5.3, or 0.53 of an inch, &c. Hence it follows, that if we call the diameters of the tubes D, *d*, and the altitudes of the water A, *a*, we ſhall have, $D : d :: a : A$, and $A\,D = a\,d$; that is, the product of the diameter by the altitude of the water is always the ſame, or the conſtant quantity 0.053 of an inch; for when the diameter is 0.01 of an inch, the water riſes to the altitude of 5.3 inches; and $5.3 \times 0.01$ is equal to $0.053 = 0.02 \times 2.65 = 0.1 \times 0.53$. If, therefore, you wiſh to know how high the water will riſe in a tube of a given diameter, it is only neceſſary to divide 0.053 by the diameter, and the quotient expreſſes the altitude in inches, very nearly; for allowance muſt be made for difference of temperature, the nature and cleanlineſs of the glaſs, &c. which influence the altitude. Moreover, ſince the ſurface of a cylinder is as the product of the diameter multiplied by the axis, or the altitude, and it has been already ſhown, that in the part of the tube occupied by the water, the product of the diameter by the altitude is a conſtant quantity, the ſurface of the glaſs which is in contact with ſuch a pillar of water, is likewiſe a conſtant quantity.

Mr. Atwood, in his "Analyſis," has given the following method of very accurately determining the diameter of a capillary tube. Put into the tube ſome mercury, whoſe weight in grains is $w$, and let it occupy a length of the tube $l$; then, if 13.6 be the ſpecific gravity of mercury, as it is when in its pureſt ſtate, that of water being 1, the diameter will be $= \sqrt{\frac{w}{l}} \times .01923$. For let $d$ be the diameter, and the contents of the mercury will be $= d^2 l \times .7854$; and as one cubic inch of mercury weighs 3443 grains, we have $1 : 3443 :: d^2 l \times .7854 : w$; hence we ſhall have $d^2 l \times .7854 \times 3443 = w$, and $d^2 = \frac{w}{l} \div .7854 \times 3443 = \frac{w}{l} \div 2704.1322$; and $d = \sqrt{\frac{w}{l}} \div \sqrt{2704.1332} = \sqrt{\frac{w}{l}} \times \frac{1}{\sqrt{2704.1332}} = \sqrt{\frac{w}{l}} \times .01923$.

Several ingenious perſons, who, in examining the phenomena of capillary attraction, have found that the bulks of the ſuſpended pillars of water are not proportional to the ſurfaces of glaſs with which they are in contact, have been embarraſſed in explaining them; and for this purpoſe they have adopted various hypotheſes. Some have ſuppoſed that the unequal preſſure of the air upon the liquor contained in the tube and that in the veſſel is the cauſe of the aſcent in the tube. In order to account for this inequality, ſome have had recourſe to the magnitude of the particles of the air and of the aſcending fluid; others have conceived, that only an inverted cone of air, touching the ſurface of the liquor in the tube with its vertex, and having the upper orifice of its tube for its baſe, could preſs upon the ſurface contiguous to its vertex. Dr. Hook ſuppoſed that part of the preſſure of the air in the tube was taken off by its friction, which he apprehends muſt neceſſarily happen againſt the ſides in ſo narrow a paſſage; and this hypotheſis of Dr. Hook was for a long time very generally received. Thoſe who wiſh to ſee his explication of it may find it in the ſixth Obſervation of his "Micrography," or in Cotes's Hydroſtatical and Pneumatical lectures, *(ubi infra.)* But ſince it has been obſerved, that the ſame aſcent of liquors in capillary tubes occurs in vacuo as in the open air; this hypotheſis of an inequality of preſſure has been relinquiſhed; and the ſolution of the difficulty has been ſought for in the mutual attraction of the particles of fluids and thoſe of glaſs. Mr. Hawkſbee, and others, have recourſe to the attraction of the annuli of the concave ſurface of the tube. Dr. Jurin (Phil. Tranſ. N° 355, and N° 363, or Abr. vol. iv. p. 423, &c.) aſcribed the ſuſpenſion of the water to the attraction of the ſmall annular portion, or periphery of the inſide of the tube, to which the upper ſurface of the water is contiguous and adheres; this being the only part of the tube, from which the water muſt recede upon its ſubſiding, and conſequently, the only one which, by the force of its coheſion and attraction, counteracts the gravity of the water, and oppoſes its deſcent. This he ſhews to be a cauſe proportional to the effect; becauſe the periphery, and the ſuſpended column, are both in the ſame proportion as the diameter of the tube. The ſuſpenſion being thus accounted for, the ſeemingly ſpontaneous aſcent will be eaſily ſolved: for ſince the water that enters the capillary tube, as ſoon as its orifice is dipped in it, has its gravity taken off by the attraction of the periphery, with which its upper ſurface is in contact, it muſt neceſſarily riſe higher; partly by the preſſure of the ſtagnant water, and partly by the attraction of the periphery, immediately above that which is already contiguous to it. Dr. Hamilton, (Lect. ii. p. 47, &c.) diſſatiſfied with the principle adopted by Dr. Jurin and others, ſuppoſes that the pillar of water is ſupported by the attraction of the annulus contiguous to the bottom of the tube. Accordingly, he obſerves, that when the orifice of a ſmall glaſs tube, open at both ends, is dipped in water, the ſmall annular ſurface of glaſs, on the inſide of the tube contiguous to the orifice, will draw up the water lying immediately under it, and every plate of water elevated will raiſe up that lying above it, until the weight of the column raiſed counterbalance the force by which this annulus endeavours to draw up more water. The thin plate of water lying over the loweſt annulus, and every other plate of the elevated water, muſt be attracted upwards and downwards with equal forces, becauſe the attracting ſurfaces above and below it are equal; and therefore the whole column of water, lying above the loweſt annulus, being drawn equally in oppoſite directions, may be conſidered as unaffected by the attraction of the glaſs, and muſt preſs with its whole weight on the water retained at the orifice of the tube by the attraction of that loweſt annulus, which has no other ſurface below it to counteract its force. Moreover, when the water has aſcended into a ſmall glaſs tube, open at both ends, take it up, and wiping off the drop hanging at the end of it, invert the tube: the ſmall column of included water, being drawn equally by the glaſs in oppoſite directions, will deſcend by its own gravity, or ſtop only when it arrives at the loweſt orifice. Or, whilſt the included column is deſcending, let the loweſt orifice be dipped in water, and taken up, and a ſmall plate of water will be retained at its orifice, and then the included column will be quieſcent. Now this column muſt, by means of the intermediate air, preſs with its whole weight upon the plate of water at its orifice, which can be retained by no other force than the attraction of the glaſs annulus, lying juſt within the orifice of the tube. From hence it appears, ſays Dr. Hamilton, that this attraction alone is ſufficient to ſuſtain, and conſequently to raiſe all the water that riſes in glaſs tubes. Againſt this reaſoning Mr. Parkinſon, *(ubi infra)* has alleged the following experiments. 1. Let a cylindrical glaſs tube be divided into very ſmall equal annuli, *a*, *b*, *c*, *d*, *e*, &c. (*fig.* 4.) and *a* being dipped in water, a thin plate of the fluid will be detached from the maſs, which being now in contact with the ſecond annular ſurface *b*, poſſeſſing the ſame power of attraction with *a*, muſt, partly at leaſt, be raiſed by it; and the caſe will be the ſame with the remaining annuli. And if the efforts of the intermediate annuli ſhould be equal and oppoſite, which cannot be allowed, yet the ſuperior annulus at *g*, would be unaffected, and its whole force remain entire, and it muſt contribute, at leaſt, towards the ſupport of the column of water. But that each annulus ſhould exert a force in elevating the lamina of fluid contiguous to it, and not contribute towards the ſupport of the fluid thus elevated, is unaccountable; the power of attraction being inherent in the glaſs, and inſeparable from it. 2. Let the orifice, F, of the compound tube, E D F, (*fig.* 5.) be dipped in water, and it will riſe to an altitude equal to *g b*; and if D F be filled, ſo that the fluid be not in contact with the narrower part, it will ſubſide till its height be equal to *g b*. But let the tube be filled ſo that the fluid be admitted into the narrower part at D, the height of the column ſuſpended will be equal to *a f*, though the loweſt annulus continues the ſame. When this tube is inverted, and the orifice, E, dipped in the fluid, it riſes to an altitude equal to *a f*, if the narrower part of the tube be ſo long; and if E D be leſs than *b g*, it riſes into the wider tube till its height be equal to *b g*, the ſame altitude as if the tubes were cylindrical, and its diameter equal to that of the wider. If theſe experiments be true, it is clear that the water, riſing ſpontaneouſly in glaſs tubes, is neither raiſed nor ſupported by the attraction of the loweſt annulus.

Others have maintained, and this opinion ſeems to be the moſt unexceptionable, that the attraction is proportional to the whole ſurface of the glaſs which is in contact with the column of water; for every point or particle of that ſurface poſſeſſes an equal attractive power; and the preſſure of the ſuſpended water is equivalent to it, or the one is a counterpoiſe to the other. This influence of glaſs, and other ſubſtances, upon fluids is ſcarcely perceptible beyond the immediate points of contact; nevertheleſs, it is clear, that a film of water of a certain thickneſs muſt be within the extent of that attractive power all round the inner ſurface of the tube, as high as the top of the pillar; but the reſt of the water, which fills up the cavity of the tube, is attracted to that film, and is kept ſuſpended by it, in conſequence of the mutual attraction of the particles of water: yet the whole column is kept up by the attraction of the glaſs, and is a counterpoiſe to that force. Let water be kept ſuſpended in the cylindrical glaſs tube, A B C D, (*fig.* 6.); and let the attraction of the glaſs extend to the lines, E G, F H; and circles of the fluid, whoſe breadths are *m n*, *r s*, &c. will adhere to the ſurface, and certainly be ſupported by the immediate attraction of the glaſs, which is ſo great, that water ſuſpended in a capillary tube will not evaporate, though expoſed to the air for ſix or ſeven months: but the intermediate column, E G H F, is only ſupported by the adheſion of the particles of the fluid to theſe circles, and to the higheſt lamina, G H; the attraction of any intermediate lamina, L M, being the ſame both upwards and downwards; and when the weight of this intermediate column exceeds their accumulated force, it muſt deſcend. This ſeems to be certain, that the ſhell of particles, C E F D, is ſuſtained by the intermediate action of the glaſs, which is diffuſed to the intermediate lamina, *n p*, *s t*, &c. by the coheſion of the particles themſelves; and in this manner the forces of the oppoſite points, *m*, *q*, and *r*, *v*, conſpire, which does not obtain in the forces of the particles upon the outſide of the tube; and this ſeems to be the reaſon why a column of the fluid is not elevated upon the outſide, as it is within. Upon the whole it appears, that the preſſure of the column of water in the tube is equivalent, or it is a counterpoiſe, to the attractive force of the ſurface of the glaſs, which is in contact with it; and of courſe it is proportional to that ſurface. But in eſtimating the quantity of that counterpoiſe, or of the preſſure of the column of water, we muſt take into the account not only the quantity, but alſo the altitude; becauſe, *cæteris paribus*, fluids preſs in proportion to their perpendicular altitudes; and when the baſe varies, as in different cylindrical pillars, the preſſures are as the products of the quantity of matter by the altitude of each pillar reſpectively. Therefore the preſſure of the pillar of water in a glaſs tube, which is a counterpoiſe to the attraction of the glaſs, is the product of the quantity of water by the altitude; and in cylindrical tubes, this product is always proportional to the ſurface of glaſs in contact with water. Having already ſhewn, that this ſurface is a conſtant quantity, it follows, that the product of the quantity of water by the altitude of the pillar muſt likewiſe be a conſtant quantity; ſince it is as the abovementioned ſurface. In order to illuſtrate this by an example; let the inſide of the diameter of a tube, B C, (*fig.* 7.) be double that of the tube, D F; then the pillar of water, F E, will be two inches high when the pillar, A C, is one inch high. Since the contents of cylinders of the ſame altitude are as the ſquares of their reſpective diameters, and their ſurfaces are ſimply as their diameters, it is eaſily calculated that if the quantity of water in the pillar, E F, weighs two grains, that of A C muſt weigh four grains; and likewiſe that the ſurface of glaſs in contact with the pillar of water, E F, is equal to the ſurface of glaſs which is in contact with the pillar of water, A C; hence it ſhould ſeem that thoſe equal ſurfaces ought to keep ſuſpended equal quantities of water; whereas the quantity of water, E F, is the half of the quantity of water, A C; but the height of the pillar of water, E F, is double that of the pillar, A C; and conſequently, its preſſure, which is equal to the product of the quantity of water by the altitude (viz. two grains by two inches) is equal to the preſſure of the column, A C, viz. the product of four grains by one inch.

If a tube conſiſt of two cylinders, one E F, (*fig.* 8.) whoſe diameter is equal to that of the tube, A B, in which the water would riſe to the height A B, and the other, a larger part, C D, whoſe diameter is equal to that of the tube, G H, in which the water would riſe to the height G H; and if this compound tube be placed with the narrow aperture in water, as at F, the water will not riſe in it higher than the altitude G H, i. e. to the ſame altitude to which it would riſe if the tube were an uniform cylinder of the diameter of the large part. It might, indeed, be expected, that the water would riſe higher than D, G; but it muſt be conſidered that though the product of the pillar of water, E F, by its altitude is leſs than a juſt counterpoiſe to the attraction of the ſurface, E F, of the glaſs; yet the exceſs of attraction of that ſurface, inſtead of aiding to ſupport the water in C E, will operate in a contrary way: that is, if we ſtate the attraction of the ſurface, E F, equal to 10, and if the preſſure of the pillar of water in it be equal to 8; then the two remaining parts of attractive power will tend to draw the water from the baſon as much as from the cavity, D E, towards the ſurface, E F; ſo that by the addition of the narrow tube, E F, the attraction of the larger part, D I, is diminiſhed; at the ſame time that the water in it is partially ſupported by what may be called its perforated baſe, I E.

If a compound tube conſiſting of a larger part, L N, (*fig.* 8.) in which the water would riſe ſpontaneouſly to the altitude, M, and of a narrower part, O K, equal in diameter to the tube, A B, in which the water would riſe to the height A B, be filled with water as high as K, and then be placed with the large aperture in water as at N, the whole quantity of water will remain ſuſpended, filling the whole of the large tube and part of the narrow one. The ſame thing will alſo take place with a veſſel of any ſhape, as P Q S, provided its upper part be drawn into a narrow cylinder equal in diameter to the tube, A B. In theſe veſſels the water is ſupported partly by the attraction of coheſion, and partly by the preſſure of the atmoſphere. That the preſſure of the atmoſphere contributes in a great degree to this effect is evident, becauſe the water will not riſe ſpontaneouſly into the veſſels, O N, P S, to the heights K and P, and alſo becauſe if theſe veſſels full of water as high as P, K, together with the baſon, be placed under the receiver of an air-pump, on exhauſting the receiver of air or removing the preſſure of the atmoſphere, the water will deſcend in them, and will remain in them only as high as it would aſcend ſpontaneouſly. Mr. Cavallo (*ubi infra*) has illuſtrated the mode by which water is ſupported in theſe veſſels; and for this purpoſe he has calculated, that if the diameter of the aperture, P, be 0.004 of an inch, which will be nearly the caſe when the perpendicular altitude, P Q, of the water is 1 foot, the whole preſſure of the atmoſphere on the ſurface of the water in the tube at P, will be little more than one grain; and as the atmoſphere preſſes upon that ſurface with only the 32d part of its entire force, the perpendicular height of the water in the veſſel, P Q S, being one foot, the actual preſſure of the atmoſphere on the ſurface of the water at P, will be $\frac{4}{100}$dths of a grain nearly. But this trifling preſſure not being ſufficient to overcome the attraction between the water and the ſurface of the tube, P, the water muſt remain ſuſpended in the veſſels, P Q S, or O N. The following experiment corroborates this explanation. Fill the veſſels, O N, or P Q S, up to the height, T, by lowering them in the water of the baſon; and in that ſituation touch the aperture, O, or P, with a wet finger, ſo as to introduce a little water into it. Then if the veſſel be drawn up, leaving its lower aperture only in the water of the baſon, the column of water, T N, or T Q, will remain ſuſpended in it, though there be no communication whatever between the water at T, and the water in the capillary aperture.

The altitudes of water, ſuſpended in compound tubes, vary inverſely as the diameters of the upper orifices nearly. E. G. In open cylindrical tubes, whoſe diameters are equal to thoſe of the different parts, A B, and C, (*fig.* 9.) of the compound tube, A B C, water riſes ſpontaneouſly to altitudes equal to *g r*, and *g s*, which are inverſely as their diameters nearly. Whether the orifice, A or C, be immerſed in the fluid, it riſes to the altitude, *g r*; but if the tube be filled, ſo that the water may be in contact with the narrow part of the tube, C, the whole column will be ſuſpended, if its altitude does not exceed *g s*. Again, let *af*, and *bg*, (*fig* 10.) be the altitudes of water raiſed ſpontaneouſly in the open cylindrical tubes, E D, and D F, reſpectively, which are inverſely as their diameters. When the wider orifice is immerſed, and the tube is filled with water to an altitude leſs than the length of the wider part, it will ſubſide to a level with the point, *g*: but if the water be admitted into the narrower tube, the whole column will be ſuſpended if its length do not exceed *af*. If the tube be inverted, and the narrower orifice immerſed, and water raiſed into the tube, D F, it immediately ſinks, if the altitude of the column exceed *bg*. Let *adc* (*fig.* 11.) be a capillary ſiphon, in whoſe narrower and wider legs, if ſufficiently long, columns of water, whoſe altitudes are *ef*, and *gh*, reſpectively, and which are inverſely as their diameters, may be ſuſpended. Fill this ſiphon with water, and hold it in the poſition of *fig.* 11; and the fluid will not run out of the orifice, *c*, unleſs the difference of the legs, *dc*, exceed *ef*. If the narrower leg be longer than the wider, the water will flow out of the orifice, *c*, (*fig.* 12.) if the leg, *dc*, exceed *gh*.

Capillary tubes which naturally diſcharge water only in ſeparate drops, yield, when electrified, a continued and accelerated ſtream; and the acceleration is proportional to the ſmallneſs of the tube: and the effect of electricity is ſo conſiderable, that it produces a continued ſtream from a very ſmall tube, out of which the water had not before been able to drop. Prieſtley's Hiſt. Electr. 8vo. vol. i. p. 171. ed. 3d.

In connection with the preceding account of capillary tubes we ſhall here introduce that of contiguous glaſs plates, between which water riſes according to the ſame law with that of ſuch tubes, or in ſuch a manner that the altitudes are inverſely as the diſtances of the plates. E. G. If the glaſs plates be parallel to each other and placed with their lower edges in water, the water will riſe between them, and will remain ſuſpended at a certain height. This height is not ſo great as that of the water in a glaſs tube, whoſe diameter is equal to the diſtance between the two plates, for an obvious reaſon; becauſe the water in the tube is ſurrounded on every ſide by glaſs: nevertheleſs the proportion is the ſame; i. e. in two or more pairs of glaſs plates, the altitudes of the water are inverſely as the diſtances of the plates, and the cauſe of the aſcent is the ſame as in glaſs tubes. A C D F and B C D E, (*fig.* 13.) repreſent two flat glaſs plates, placed ſo as to form a ſmall angle, A C B, and immerſed with their lower edges in water. The water will riſe between them, and remain ſuſpended in the ſpace E F C D E, the outer edge of which, E F C, being a curve called an "hyperbola." One extremity of this curve riſes as high as the upper part of the glaſs plates at C, and the other extremity reaches as far as the edges of the glaſſes contiguous to the water of the baſon at F and E. The water between theſe plates riſes higher near the ſide, C D; and lower at a diſtance from it. In ſhort, at any diſtance from C D, as at *ab*, *cd*, *ef*, the water riſes as high as it would riſe between parallel plates, whoſe diſtance from each other equalled the diſtance between the plates of *fig.* 15, at any of thoſe particular places. Conſequently the altitudes of the water at different diſtances from C D, are inverſely as the diſtances between the two plates at thoſe places. In *fig.* 14, which exhibits the ſame elevation of water with that which is repreſented in *fig.* 13, any two, or more, altitudes of water, as *ab* and *cd*, are inverſely as the diſtances *bt*, *di*, between the two plates at thoſe places; viz. $ab : cd :: di : bt ::$ (by the ſimilarity of the triangles D *bt*, D *di*) D *d* : D *b*; and this is the known property of the common hyperbola, whoſe aſymptotes are the edge, C D, of the glaſſes, and the line, D S, where the glaſs plate interſects the ſurface of the water in the veſſel, G. The water muſt evidently riſe as high as the apex, C, whatever be the altitude of the plates, ſince the glaſs plates come infinitely near each other near the edge, C D. If theſe plates were bent more or leſs, then the edge of the water which riſes between them would not be an hyperbola, but vary according to the curvature of the plates. Let two flat glaſs plates be diſpoſed, as in *fig.* 15, ſo as to form a ſmall angle with each other, as in the former caſe; and the lowermoſt of theſe be ſo placed as to form a ſmall angle with the horizon, having the edge, B, a little elevated. Let them be ſeparated at E C by the interpoſition of ſome thin body, and previouſly moiſtened with water; and if a drop of water be introduced between theſe plates at E C, ſo as to touch them both, it will move ſpontaneouſly towards the upper part of the plates, as far as the edge, A B. The drop of water moves towards the edge, A B, even againſt the direction of its gravity; becauſe the attraction of the glaſſes towards the drop is ſtronger where the plates are cloſer to each other, as at *d*, than where they are further aſunder, as at *e*; ſo that the drop at *o*, is more powerfully attracted towards *d*, than towards *e*. If the ſide, A B, be gradually raiſed higher and higher above the horizon, whilſt the drop is moving, it will be perceived to move ſlower and ſlower towards A B, until at laſt the gravity of the drop balances the attraction of the glaſſes, and the water remains at reſt. After which, if the edge, A B, be raiſed ſtill higher, the weight of the drop being greater than the attraction of the glaſs, will cauſe it to deſcend towards C E.

Phenomena of attraction, ſimilar to thoſe already illuſtrated in the caſe of glaſs and water, take place between almoſt every fluid and every ſolid; even between fluids and ſolids, or ſolids and ſolids. However, a conſiderable difference reſults from the different degrees of force with which the particles of each body attract either one another, or thoſe of another body. The attraction of water to glaſs is greater than the mutual attraction of its own particles; it is alſo greater than that of any other fluid towards glaſs, not excepting even ſpirituous liquors, which are ſpecifically lighter than water; and hence it is, that water riſes higher in capillary tubes than any other liquor. Muſchenbroek, Martin, and other writers have given tables of the heights to which different fluids aſcend in capillary tubes. It is owing to this capillary attraction, that water riſes through the fine veſſels of wood, and aſcends to the tops of the higheſt trees; that it inſinuates itſelf through the pores of certain ſtones, through ſand, ſugar, ſalt, &c. and that in damp weather, when the air depoſits a conſiderable quantity of water, wood, glue, ropes, linen, paper, parchment, ſalts, &c. imbibe the water, and are thereby ſwelled, moiſtened, ſoftened, and ſome of them actually diſſolved. Hence it is that metals in a fluid ſtate riſe and ſpread themſelves between the contiguous ſurfaces of other metals that are in a ſolid ſtate; and this is the foundation of the art of ſoldering metals. Hence alſo mercury inſinuates itſelf through the pores of gold and tin; for the particles of mercury attract one another much leſs than they do thoſe of gold or tin. See Ascent of Fluids. See alſo Adhesion and Cohesion.

If glaſs be applied to any other fluid, whoſe particles attract each other more ſtrongly than glaſs attracts them, all the phenomena of ſuch a fluid in capillary tubes, and between glaſs plates, will be the reverſe of thoſe pertaining to water. Quickſilver is ſuch a fluid; and, therefore, if a ſmall globule of quickſilver be laid upon clean paper, and a piece of glaſs be brought into contact with it, the mercury will adhere to it, and will be drawn away from the paper: but if, whilſt the ſmall globule of quickſilver is thus adhering to the glaſs, a large quantity of the ſame fluid be brought in contact with the ſmall globule, the latter will immediately diſengage itſelf from the glaſs, and incorporate with the other maſs. We here perceive that a greater degree of attraction ſubſiſts between the particles of mercury than between them and glaſs, ſo that it is impoſſible to ſpread quickſilver, like water, over the ſurface of glaſs. If quickſilver be put in a glaſs, and any wooden or earthen veſſel, more than an inch in width, the ſurface of the quickſilver will be horizontal towards the middle, but convex towards the ſide. If an iron ball be laid upon quickſilver, a depreſſion of the quickſilver will be obſerved all round the ball. If two ſuch balls be placed upon quickſilver, not very far aſunder, they will run towards each other; becauſe, where the cavities or depreſſions of the quickſilver are joined either between the ball and the ſide of the veſſel, or between the two balls, there the preſſure of the quickſilver upon the ball, or balls, is diminiſhed by the attraction of the quickſilver below ; and of courſe the balls are impelled that way by the ſuperior preſſure on the oppoſite ſides. If a ſmall tube, (*fig.* 16) open at both ends, be partly immerſed in mercury, the mercury will be found to ſtand lower within the tube than in the veſſel ; and this depreſſion has been found to be inverſely as the diameters of the tubes. Thus, if two tubes are immerſed in quickſilver, and the diameter of one is double that of the other, then the difference of perpendicular altitudes between the ſurface of the quickſilver in the latter tube and in the baſon, will be double to the like difference with the former tube. As quickſilver is an opake body, it will be neceſſary to hold the tube A B near the ſide of the veſſel, which is ſuppoſed to be of glaſs, in order to render the depreſſion of the quickſilver within the tube perceptible. The ſame thing takes place between parallel glaſs plates. If they be immerſed in quickſilver, this fluid will ſtand lower between them than in the other part of the veſſel ; and the depreſſion is likewiſe as the diſtances between the plates. If the plates be ſituated ſo as to form a ſmall angle, the quickſilver, riſing leſs near the angular edge than at a diſtance from it, will form a curve, which is an hyperbola, whoſe aſymptotes are the perpendicular edge, or line of the junction of the glaſſes, and the level of the mercury in the baſon. If a glaſs plate be laid in an horizontal ſituation, with a pretty large drop of quickſilver near one edge of it, as in *fig.* 17, which repreſents a ſection of it, and another glaſs plate, A B, be laid ſo as to form a ſmall angle with it, and at the ſame time to compreſs the drop of quickſilver, the latter will move ſpontaneouſly towards O, *i. e.* towards the aperture of the angle, in order to recover its globular figure. If a tube open at both ends, but having its lower end drawn out into a fine capillary aperture, be filled with quickſilver to the altitude of about an inch or two, no mercury will eſcape from the lower aperture ; but if this lower extremity be ſuffered to touch other mercury, or if, by breaking off part of the ſmall end, the aperture be enlarged, the quickſilver will readily run out. For other particulars relating to this ſubject ; ſee the articles to which we have already referred. Muſchenbroek, Introd. at Phil. Nat. tom. i. c. 20. Graveſand. l. i. c. 5. Helſham, Lect. i. ii. Cotes's Hydroſt. &c. Lectures, lect xi. Newt. Opt. p. 380. Hamilton's Lect. ii. Deſaguliers Courſe of Exp. Phil. vol. i. p. 10. p. 37, &c. Martin's Phil. Brit. vol. i. p. 24, &c. Parkinſon's Syſt. of Mechanics and Hydroſtatics, ch. v. Cavallo's Elem. of Nat. or Exp. Phil. vol. ii. ch. 5.

CAPILLARY *veſſels*, in *Anatomy*, the moſt minute and ſubtle ramifications of the veſſels of animal bodies. Many ſmall veſſels of animal bodies have been diſcovered by the modern invention of injecting the veſſels of animals with a coloured fluid, which upon cooling grows hard. See INJECTION.

CAPILLARY *worms*, in children, are the ſame with what are otherwiſe called *crinones*, *comedones*, and *dracunculi*.

CAPILLATION, or CAPILLARY *fracture*, according to ſome writers, is a fracture in the ſkull, ſo ſmall that it can ſcarcely be perceived ; but yet it often proves mortal. See FRACTURE.

CAPILLITIUM VENERIS, in *Phyſiology*, denotes a meteor appearing in the air, in form of fine threads reſembling a ſpider's web.

Some think that the capillitium Veneris derives its origin from a cloud, the watery parts of which having been exhaled by the ſun's heat, only the earthy and ſulphureous parts are left behind, which ſhoot into this figure. It is ſometimes alſo found hanging about woods and coppices, or even extended on the ground like a fine net, frequently enough miſtaken for ſpiders' webs.

CAPILLUS. See HAIR.

CAPILLUS *Veneris*, in *Botany*, See ADIANTUM CAPILLUS VENERIS

CAPILUPI, LELIO, CAMILLO, IPPOLITO, and JULIO, in *Biography*, natives of Mantua and diſtinguiſhed as modern Latin poets. *Lelio*, who is ſaid to have died in his native place in 1560, at the age of 62 years, excelled in the compoſition of centos, and applied ſome of the verſes of Virgil to a deſcription of the modes of life in monaſteries, and of the venereal diſeaſe. *Camillo* wrote a book entitled "the Stratagem," in which he gives an account of the maſſacre at Paris on St. Bartholomew's day : he was not only diſtinguiſhed as a poet, but employed in ſeveral embaſſies. He died in 1548. *Ippolito*, the third brother, was born in 1511, occupied ſeveral poſts of dignity, and whilſt he was firſt ſecretary and miniſter at Rome of cardinal Hercules and D. Ferrante Gozanga, wrote letters to both, ſeveral of which are extant. The moſt intereſting are thoſe that relate to the war of Parma and Mirandola carried on by pope Julius III. and they diſplay much ſkill in negociation and great zeal in the ſervice of his maſter. In 1560 he was promoted to the biſhopric of Fano by Pius IV. and in the following year deputed as his nuncio to Venice. He died at Rome in 1580. *Julio*, the nephew of the former, is ſaid to have ſurpaſſed his uncle Lelio in the compoſition of centos. Some have ſaid that Ippolito excelled in ſatirical poetry ; but others affirm that he, as well as Julio and Camillo, excelled in the elegiac. The "Virgilian cento of the lives of Monks" was printed at Baſil in 1556 ; and Meibomius publiſhed "Julii et Lælii Capiluporum patrum Centones Virgiliani, &c." at Helmſtadt, in 4to. 1600. The "Carmina eorundem," appeared at Rome, 4to. 1527. The poems of the other brothers are printed in the firſt volume of the Deliciæ Poetarum Italorum. Gen. Dict. Tiraboſchi.

CAPINERO, in *Ornithology*, one of the ſynonyms of MOTACILLA ATRICAPILLA, being the name aſſigned it by Olina.

CAPIPLENIUM, from *caput*, *head*, and *plenus*, *full*, is uſed by ſome authors for a catarrh ; but more properly, by the Italian phyſicians, for a continual heavineſs of the head, frequent at Rome, and almoſt endemic.

CAPIRO, in *Geography*, a mountain of South America, being one of thoſe that ſurround the harbour of Porto Bello, ſtands at the utmoſt extremity of the harbour in the road to Panama. Its top is always covered with clouds of a denſity and darkneſs ſeldom ſeen in thoſe of this atmoſphere ; and from theſe, which are called the "Capillo," or cap, has poſſibly been corruptly formed the name of Monte Capiro. When theſe clouds thicken, increaſe in blackneſs, and ſink below their uſual ſtation, it is a ſure ſign of a tempeſt. Whereas on the other hand, their clearneſs and aſcent as certainly indicate the approach of fair weather. Theſe changes are very frequent and very ſudden ; and the ſummit of the mountain is ſeldom obſerved free from clouds. Hence Capiro is regarded as the barometer of the country, by foretelling every change of weather.

CAPISCOLUS, or CAPISCHOLUS, in *Eccleſiaſtical Writers*, denotes a dignitary in certain cathedrals, who had the ſuperintendency of the choir, or band of muſic, anſwering to what in other churches is called *chanter* or *precentor*. The word is alſo written *cabiſcolus*, and *caputſcholæ*, q. d. the *head of the ſchool* or *band of muſic*. The capiſcolus is alſo called *ſcolaſticus*, as having the inſtruction of the young clerks and choriſters, how to perform their duty.

CAPISSA, in *Ancient Geography*, a country of Aſia, in Paropamiſus, mentioned by Ptolemy and Pliny. The latter alſo mentions a town in this country, which was deſtroyed by Cyrus.

CAPISTRAN, John, in *Biography*, a Franciſcan friar, was born at Capiſtran in Naples, in 1385; and having firſt ſtudied the law at Perugia, he relinquiſhed this profeſſion and entered into the order of St. Francis, in 1415. In this connection he roſe, by the auſterity of his manners, as well as by his zeal and eloquence, to the principal offices of his order. As he was ardently attached to the papal authority, he was employed in ſeveral important ſervices by pope Eugenius IV.; and Nicholas V. ſent him into Bohemia to convert the Huſſites and the Jews; of the latter he cauſed many to be burnt in Sileſia, under a pretence of their behaving irreverently towards the conſecrated bread. He was alſo employed to preach a cruſade againſt the Turks, in Germany, Hungary, and Poland; and he contributed by his eloquence to aſſemble the army, which, under the command of the famous Huniades, raiſed the ſiege of Belgrade, in 1456. Capiſtran, in his letter to the pope and the emperor, arrogates to himſelf the honour of this victory. Huniades, on the other hand, takes no notice of Capiſtran, who died within three months after the battle of Belgrade, and was buried in the convent of Willak, in Hungary. Miracles are ſaid to be wrought at his tomb. He was canonized by pope Alexander VIII. in 1690, after having been beatified by Gregory XV. His principal works were "Speculum Clericorum;" "De Poteſtate Papæ et Conſilii;" "De Pœnis Inferni et Purgatorii;" a treatiſe againſt the Huſſites; and ſome pieces on the civil and canon law. Gen. Dict. Tiraboſchi.

Capistran, in *Geography*, a ſmall place, with a principality, of Naples, in the province of Abruzzo Ultra.

CAPISTRATUS, in *Ichthyology*, a ſpecies of Chætodon, with entire tail; twelve ſpines in the dorſal fin; body ſtriated; and an ocellated ſpot near the tail.

This fiſh has the head rather large, with eyes of conſiderable ſize; a black ocular band with white margin; fins yellowiſh, with branched rays; dorſal and anal fin bordered with brown; and a black band near the caudal fin.

CAPISTRUM, *Lat.* a bandage uſed by performers on trumpets and other wind inſtruments among the ancients, to keep the cheeks and lips firm, and to prevent the diſtortion of the countenance. It was called φορβεια, or περιστομιον, by the Greeks, and is ſuppoſed to have been invented by Marſyas. It is mentioned in Plutarch's Sympoſiacs, in the Scholiaſt of Ariſtophanes, and elſewhere, and may be ſeen in ſome ancient ſculpture which Bartholinus has had engraved in his treatiſe "De Tibiis Veterum."

Capistrum, in *Surgery*, a head-ſtall, or bandage uſed in caſe of injuries of the head, eſpecially fractures of the jaw.

CAPITA, or Capitum, in *Antiquity*, denotes a tax among the Romans for the maintenance of the horſes in the army, levied according to the number of heads thereof.

Capita, *diſtribution by*, in the *Civil Law*, is ſuch a diſtribution, that every man has an equal ſhare of *perſonal* eſtate, when all the claimants claim in their own rights, as in equal degree of kindred, and not *jure repreſentationis*, in the right of another perſon. This mode of diſtribution is contradiſtinguiſhed from a diſtribution *per ſtirpes*, which is the only rule of ſucceſſion according to the common law. Thus, if the next of kin be the inteſtate's three brothers, A, B, and C; here his effects are divided into three equal portions, and diſtributed *per capita*, one to each: but if one of theſe brothers, A, had been dead, leaving three children, and another, B, leaving two; then the diſtribution muſt have been *per ſtirpes*; viz. one-third to A's three children; another third to B's two children; and the remaining third to C, the ſurviving brother: yet, if C had been alſo dead, without iſſue, then A's and B's five children, being all in equal degree to the inteſtate, would take in their own rights *per capita*; viz. each of them one-fifth part. Blackſt. Com. vol. ii p. 517.

Capita, *ſucceſſion by*, is that where the claimants are next in degree to the anceſtor, in their own right, and not by right of repreſentation. Thus, if the next heirs of Titius be ſix nieces, three by one ſiſter, two by another, and one by a third; his inheritance by the Roman law was divided into ſix parts, and one part given to each of the nieces: whereas the law of England in this caſe would ſtill divide it only into three parts, and diſtribute it *per ſtirpes*, thus; one-third to the three children who repreſent one ſiſter, another third to the two who repreſent the ſecond, and the remaining third to the one child who is the ſole repreſentative of her mother. Blackſt. Com. vol. ii. p. 218.

CAPITAL, of the Latin *caput*, is uſed on various occaſions to expreſs the relation of a head, chief, or principal: thus,

Capital *City*, intimates the principal city of a kingdom, province, or ſtate; as London is the capital, or capital city of England; Moſcow, of Ruſſia; Conſtantinople, of the Ottoman empire; &c. See City and Metropolis.

M. Bayle has a diſcourſe on the advantages of being born and living in the capital of the country.

Capital *Court*, *capitalis curia*, the chief manor-houſe, or place-houſe where the lord of the manor holds his court; called alſo in Kent the court-lodge. See Court.

Capital-court is ſometimes uſed for the ſame with capital meſſuage, which ſee.

Capital *Crime*, is that which ſubjects the criminal to a capital puniſhment, i. e. to the loſs of life. See Crime and Punishment.

Capital *Honour*, *capitalis honor*, denotes the chief honour, or prime barony of the whole county, as that in ancient times uſually enjoyed by the count or earl of ſuch county.

Capital *Letters*. See Capitals.

Capital *Lord*, *capitalis dominus*, the lord of the fee, from whom the eſtate is held by inferior tenants.

Capital *Picture*, in *Painting*, denotes one of the moſt excellent pieces of any celebrated maſter.

Capital, or Capital *Stock*, in *Commerce*, is the fund, or ſtock, of a trading company, or corporation; or the ſum of money which they jointly furniſh, or contribute, to be employed in trade. It is alſo uſed to denote the ſtock which a merchant or tradeſman employs in buſineſs on his own account; or the ſum of money which an individual advances towards making up the trading ſtock of a partnerſhip when it is firſt formed. If we extend our views to ſociety at large; the term ſtock is uſed in a greater latitude; and the whole ſtock which a man poſſeſſes may be diſtinguiſhed into two parts; viz. that which is to afford him a revenue, and which is called his capital; and that which ſupplies his immediate conſumption. See Stock. A capital may be employed ſo as to yield a revenue or profit to its employer in two different ways, and accordingly acquires two diſtinct denominations. The capital, employed in raiſing, manufacturing, or purchaſing goods, and ſelling them again with a profit, may properly be called a circulating capital; becauſe it yields no revenue or profit, while the employer retains it in his own poſſeſſion, and whilſt it continues in the ſame ſhape; it is by means of circulation, or ſucceſſive exchanges, that it yields any profit.

But if a capital be employed in the improvement of land, in the purchaſe of uſeful machines and inſtruments of trade, or in ſimilar things which yield a profit without changing maſters, or circulating any farther; this kind of capital may be called a fixed capital. Every fixed capital is originally derived from, and requires to be continually ſupported by a circulating capital: nor can the former yield any revenue but by means of the latter. The circulating capital alſo in its turn requires freſh ſupplies, without which it would ſoon ceaſe to exiſt; and theſe ſupplies are principally drawn from three ſources, viz. the produce of land, that of mines, and that of fiſheries: the cultivation of which requires both a fixed and a circulating capital, and yields a profit, when their natural fertility is equal, proportional to the extent and proper application of the capitals employed about them; or, if the capitals are equal, and equally well applied, proportional to their natural fertility. The intention of the fixed capital is to increaſe the productive powers of labour, or to enable the ſame number of labourers to perform a much greater quantity of work. In a great country, the expence of maintaining a fixed capital may be compared to that of repairs in a private eſtate; and is thus neceſſarily excluded from the neat revenue of the ſociety. But the caſe is different with reſpect to that which maintains the circulating capital. Of the four parts of which this latter capital is compoſed, viz. money, proviſions, materials, and finiſhed work, the three laſt are regularly withdrawn from it, and placed either in the fixed capital of the ſociety, or in their ſtock reſerved for immediate conſumption. Whatever portion of theſe conſumable goods is not employed in maintaining the former, goes altogether to the latter, and forms a part of the neat revenue of the ſociety. In this reſpect the circulating capital of a ſociety is different from that of an individual; the latter is totally excluded from making any part of his neat revenue, which muſt conſiſt wholly in his profits. But though the circulating capital of every individual makes a part of that of the ſociety to which he belongs, it is not on that account totally excluded from making a part likewiſe of their neat revenue. Although the whole goods in a merchant's warehouſe or ſhop muſt by no means be placed in his own ſtock, reſerved for immediate conſumption, they may be ſo placed in that of other people, who, from a revenue derived from other funds, may regularly replace their value to him, together with its profits, without occaſioning any diminution either of his capital or of theirs. Money, therefore, is the only part of the circulating capital of a ſociety, of which the maintenance can occaſion any diminution in their neat revenue. The fixed capital, and that part of the circulating capital which conſiſts in money, ſo far as they affect the revenue of the ſociety, bear a very great reſemblance to one another. See MONEY. When we compare the quantity of induſtry which the circulating capital of any ſociety can employ, we muſt always have regard to thoſe parts of it only, which conſiſt in proviſions, materials, and finiſhed work: the other, which conſiſts in money, and which ſerves only to circulate thoſe three, muſt always be deducted. Money may be requiſite for purchaſing the materials and tools of the work, as well as the maintenance of the workmen. But the quantity of induſtry which the whole capital can employ, is certainly not equal both to the money which purchaſes, and to the materials, tools, and maintenance, which are purchaſed with it; but only to one or other of theſe two values, and to the latter more properly than to the former. Smith's Wealth of Nations, vol. i. For the extenſion of capitals by the aid of banks and paper-credit; ſee BANK and PAPER-MONEY.

CAPITAL, in *Money Matters*, denotes the ſum of money put out to intereſt. In which ſenſe it amounts to the ſame with *principal*, and ſtands oppoſed to *intereſt*. The borrower may uſe it either as a capital, yielding a certain annual rent to the lender, or as a ſtock reſerved for immediate conſumption. If he uſes it as a capital, he employs it in the maintenance of productive labourers, who reproduce the value with a profit; in which caſe he will be able both to reſtore the capital and pay the intereſt without alienating or encroaching upon any other ſource of revenue. But if he uſes it as a ſtock reſerved for immediate conſumption, he acts the part of a prodigal, and diſſipates in the maintenance of the idle, what was deſtined for the ſupport of the induſtrious; and in this caſe, he can never reſtore the capital nor pay the intereſt, without either alienating or encroaching upon ſome other ſource of revenue, ſuch as the property or the rent of land. What the borrower in either of theſe ways really wants, and what the lender readily ſupplies him with, is not the money, but the money's worth, or the goods which it can purchaſe. If he wants it as ſtock for immediate conſumption, it is thoſe goods only which he can place in that ſtock. If he wants it as a capital for employing induſtry, it is from thoſe goods only that the induſtrious can be furniſhed with the tools, materials, and maintenance, neceſſary for carrying on their work. By means of the loan the lender, as it were, aſſigns to the borrower his right to a certain portion of the annual produce of the land and labour of the country, to be employed as the borrower pleaſes. It is the value of that part of the annual produce, which, as ſoon as it comes from the ground, or from the hands of the productive labourers, is deſtined not only for replacing a capital, but ſuch a capital as the owner does not care to be at the trouble of employing himſelf, that regulates the quantity of ſtock, or of money, which can be lent at intereſt in any country. As ſuch capitals are commonly lent out and paid back in money, they conſtitute what is called the *monied intereſt*; which ſee.

Theſe capitals may be greater in almoſt any proportion than the amount of the money which ſerves as the inſtrument of their conveyance; the ſame pieces of money ſucceſſively ſerving for many different loans, as well as for many different purchaſes. Hence, a capital lent at intereſt may, in this manner, be conſidered as an aſſignment from the lender to the borrower of a certain conſiderable portion of the annual produce; upon condition that the borrower in return ſhall, during the continuance of the loan, annually aſſign to the lender a ſmaller portion, called the intereſt; and at the end of it, a portion equally conſiderable with that which had been originally aſſigned to him, called the repayment. In proportion as the ſhare of the annual produce which, as ſoon as it comes either from the ground, or from the hands of the productive labourers, is deſtined for replacing a capital, increaſes in any country, what is called the "Monied Intereſt" naturally increaſes with it. The increaſe of thoſe particular capitals from which the owners wiſh to derive a revenue, without being at the trouble of employing them themſelves, naturally accompanies the general increaſe of capitals; or, in other words, as ſtock increaſes, the quantity of ſtock to be lent at intereſt grows gradually greater and greater. As capitals increaſe in any country, the profits which can be made by employing them neceſſarily diminiſh; and it becomes gradually more and more difficult to find within the country a profitable method of employing any new capital. In conſequence of this there ariſes a competition between different capitals; the owner of one endeavouring to get poſſeſſion of that employment which is occupied by another. The demand for productive labour, by the increaſe of the funds which are deſtined for maintaining it, grows every day greater and greater; ſo that labourers eaſily find employment, whilſt the owners of capitals find it difficult to get labourers to employ. This competition raiſes the wages of labour, and ſinks the profits of ſtock. But when the profits which can be made by the uſe of a capital are thus diminiſhed, as it were, at both ends, the price which can be paid for the uſe of it, that is, the rate of intereſt, muſt neceſſarily be diminiſhed with them. See INTEREST.

All capitals are deſtined for the maintenance of productive labour only; and yet the quantity of ſuch labour, produced by equal capitals, varies very much according to the diverſity of their employment; which is alſo the caſe with reſpect to the value added by that employment to the annual produce of the land and labour of the country.

A capital may be employed in four different ways; either, *firſt*, in procuring the rude produce annually required for the uſe and conſumption of the ſociety; or, *ſecondly*, in manufacturing and preparing that rude produce for immediate uſe and conſumption; or, *thirdly*, in tranſporting either the rude or manufactured produce from the places where they abound to thoſe where they are wanted; or, *laſtly*, in dividing particular portions of either into ſuch ſmall parcels as ſuit the occaſional demands of thoſe who want them. In the firſt of theſe ways are employed the capitals of all thoſe who undertake the improvement or cultivation of lands, mines, or fiſheries: in the ſecond, thoſe of all maſter manufacturers; in the third, thoſe of all wholeſale merchants; and in the fourth, thoſe of all retailers. Each of theſe methods of employing a capital is eſſentially neceſſary either to the exiſtence or extenſion of the other three, or to the general conveniency of the ſociety. The perſons whoſe capitals are employed in any of theſe four ways are themſelves productive labourers. Equal capitals, however, thus employed, put into motion very different quantities of productive labour, and augment alſo in very different proportions the value of the annual produce of the land and labour of the ſociety to which they belong. But no equal capital puts into motion a greater quantity of productive labour than that of the farmer; and, of courſe, the capital employed in agriculture adds a much greater value to the annual produce of the land and labour of the country, and to the real wealth and revenue of its inhabitants. Conſequently, of all the ways in which a capital can be employed, this is by far the moſt advantageous to the ſociety. The capitals employed in the agriculture and in the retail trade of any community muſt always reſide within that community. Whereas the capital of a wholeſale merchant ſeems to have no fixed or neceſſary reſidence any where, but may wander about from place to place, according as it can either buy cheap or ſell dear. The capital of the manufacturer muſt reſide where the manufacture is carried on; but where this ſhall be is not always neceſſarily determined. It may frequently be at a great diſtance from the place where the materials grow, and from that where the complete manufacture is conſumed. Thus, part of the wool of Spain is manufactured in Great Britain, and ſome part of that cloth is afterwards ſent back to Spain. The ſame obſervation applies to the cotton manufacture. Whether the merchant whoſe capital exports the ſurplus produce of any ſociety be a native or a foreigner, is of very little importance; but it is of greater conſequence, that the capital of the manufacturer ſhould reſide within the country. It may, however, be very uſeful to the country, though it ſhould not reſide within it. The capitals of the Britiſh manufacturers, who work up the hemp and flax annually imported from the coaſts of the Baltic, are without doubt very uſeful to the countries which produce them. The merchants who export the commodities wanted in theſe countries, in exchange for theſe materials, replace the capitals of the people who produce them, and thus encourage them to continue the production; and the Britiſh manufacturers replace the capitals of thoſe merchants.

When the capital of any country is not ſufficient for all the three purpoſes now recited, in proportion as a greater ſhare of it is employed in agriculture, the greater will be the quantity of productive labour which it puts into motion within the country, and alſo the value which its employment adds to the annual produce of the land and labour of the ſociety. After agriculture, the capital employed in manufactures puts into motion the greateſt quantity of productive labour, and adds the greateſt value to the annual produce. That which is employed in the trade of exportation has the leaſt effect of any of the three. The country, which has not capital ſufficient for all theſe three purpoſes, has not arrived at that degree of opulence for which it ſeems naturally deſtined. But an attempt to accompliſh all theſe three, prematurely, and with an inſufficient capital, is certainly not the ſhorteſt way for a ſociety, any more than for an individual, to acquire a ſufficient one. The capital of all the individuals of a nation has its limits like that of a ſingle individual, and is capable of executing only certain purpoſes; and it is increaſed by their continually accumulating and adding to it whatever may be ſaved out of their revenue: and the revenue of all the inhabitants of the country is neceſſarily in proportion to the value of the annual produce of their land and labour. The courſe of human proſperity, indeed, ſeems ſcarcely ever to have continued ſo long as to enable any great country to acquire capital ſufficient for all theſe three purpoſes; unleſs, perhaps, we give credit to the wonderful accounts of the wealth and cultivation of China, of thoſe of ancient Egypt, and of the ancient ſtate of Hindooſtan. Theſe three countries have been chiefly renowned for their ſuperiority in agriculture and manufactures; nor do they appear to have been eminent for foreign trade. The greater part of the ſurplus produce of all theſe countries ſeems to have been always exported by foreigners, who give in exchange for it ſomething elſe for which they found a demand there, frequently gold and ſilver. It is thus that the ſame capital will in any country put into motion a greater or ſmaller quantity of productive labour, and add a greater or ſmaller value to the annual produce of its land and labour, according to the different proportions in which it is employed in agriculture, manufactures, and wholeſale trade. See TRADE. The conſideration of his own profit is the ſole motive which determines the owner of any capital to employ it either in agriculture, in manufactures, or in ſome particular branch of the wholeſale or retail trade; and, therefore, in countries, where agriculture is the moſt profitable of all employments, the capitals of individuals will naturally be employed in the manner moſt advantageous to the whole ſociety. The profits of agriculture, however, ſeem to have no ſuperiority over thoſe of other employments in any part of Europe; inſomuch that it would be difficult to produce a ſingle inſtance, in which a large fortune has been acquired by agriculture, in the ſame time and from the ſame capital, which have yielded ſuch a fortune by trade and manufactures, in the whole of Europe during the preſent century; and therefore agriculture is capable of abſorbing a much greater capital than has ever yet been employed in it. Smith's Wealth of Nations, vol. ii. Book ii.

CAPITAL, in *Architecture*. This term is taken immediately from the Italian word *Capitello*, which is derived from the Latin *caput*, head. Thus the etymology of this word deſines its meaning, for the capital is properly the head of a column.

The capitals uſed in the architecture of the Greeks, though with numberleſs minute variations of ornaments and proportions, arrange themſelves into three general claſſes, and offer the moſt obvious diſtinction between the orders. In this ſtyle alſo it is eaſy to diſtinguiſh between thoſe parts which have their uſe and origin in the original type of that wooden conſtruction from which Grecian architecture is derived and thoſe which are merely ornaments and acceſſaries. Conſidering columns in their origin as cylindrical wooden poſts, the abacus which is a ſquare tile or tablet has an evident uſe in ſheltering and protecting the upper part of the column by its projection, and alſo in giving a broader bed and more convenient form for the placing of the architrave. The abacus therefore may be regarded as the original capital which is moſt conſpicuous in that order which bears the marks of the lighteſt antiquity, attenuated and altered in ſucceeding orders and ſucceeding ages, but never omitted either in the purity of Grecian architecture or its deteriorated imitations.

The Doric order, which preſerves more of the primitive type than any other, has a broad and maſſy abacus, which with an ovolo and ſome ſmall fillets, varying in number from three to five, conſtitutes the whole capital. See *Plate* XIII. *Architecture* and *Plate* I. *fig.* 5 and 6.

In the Ionic order we find a very conſiderable variation; here we have a ſmall and moulded abacus, below which depend two ſpiral volutes; there is alſo an echinus and bead, ſee *Plate* XXVIII. *Architecture*. The ſide of the capital is different as the volutes appear only in front, and preſent a pillow or balluſter laterally.

The Corinthian is the moſt richly ornamented of capitals; in this the abacus is hollowed, forming a quadrilateral figure with concave ſides, the angles of which are generally truncated, and in the middle of each ſide there is placed a flower. Below the abacus the capital has the form of a vaſe or bell which is ſurrounded with two tier of leaves. Under each angle of the abacus riſes a volute and caulicoli bend under the flowers which occupy the centres of the ſides. See *Plate* XXIX. *Architecture*.

Such are the general characteriſtics which are common to all theſe capitals, but the variations are numerous. The Doric capital in Grecian examples varies in the more or leſs flattened form of the ovolo, in a greater or leſs number of annulets, in the proportions of the parts to one another, and to the column. In the Doric order, compoſed by modern authors from one or two imperfect Roman authorities, the caſe is very different; here we find a feeble abacus divided with mouldings; an ovolo and annulets, and below this a necking with an aſtragal and fillet. See *Plate* XVI. *Architecture*. The necking is even ſometimes ornamented with huſks and roſes.

The principal variations of the Ionic capital in ancient examples are in the ſize of the volute, the form of its curve, and number of revolutions. In the capital of this order, in the temple of Minerva Polias, at Athens, a beautiful and ſingular inſtance, we obſerve an ornamented necking. See *Plate* I. *Architecture*. The circumſtance of the Ionic capital being diſſimilar in front and ſide, has cauſed conſiderable inconvenience in its uſe. For ſuppoſing a quadrangular portico to be erected of this order, the columns in front would all have the volutes outward, and the capitals at the angles would preſent the balluſter ſide laterally; then either all the columns of the ſide ranges muſt have the balluſter ſide outwards to correſpond with thoſe at the angles, which would be a ſingular abſurdity, or uniformity muſt be violated. To remedy this defect, the ancients made the outer volute of the angular capital project diagonally, ſo as to correſpond equally with a volute in front and one on the ſide. This diſtorted capital, however, was conſidered ſo great a blemiſh, that moſt modern architects, when they had occaſion to uſe Ionic columns on plans fronting two ways, have adopted the invention of Scamozzi, which conſiſts in projecting all the volutes diagonally, thus forming a capital ſimilar every way, while the abacus has the form of the Corinthian abacus, and like that has a flower in the centre of each ſide. It is this which is called the modern Ionic capital; an invention which only obviates the difficulty complained of, by ſpoiling all the capitals, inſtead of merely thoſe at the angles, for in beauty and elegance theſe capitals will not bear the ſmalleſt compariſon with antique examples. This practice was greatly approved at the time, and nearly ſuperſeded the ancient method even in circumſtances where no accommodation was neceſſary.

The Corinthian capital varies in the diviſion and form of the leaves; theſe are directed by Vitruvius to be of the acanthus kind, and thus we find them in the order of the temple of Veſta at Tivoli. The greater number however, both of ancient and modern capitals, are compoſed of olive leaves, which have three, four, or five folds in each diviſion. The general height too varies from 57 to 77 minutes. Perhaps the moſt beautiful example extant of a Corinthian capital, is that of the three columns in the Campo Vaccino at Rome, ſuppoſed to be the remains of a temple of Jupiter Stator. See *Plate* XXIX. *Architecture*.

It remains to ſpeak of the Tuſcan capital. There are no well authenticated remains of this order, and the precepts of Vitruvius on this head are ſo obſcure that the modern compilers of ſyſtems of architecture have of courſe varied exceedingly in their deſigns, and the order that paſſes under this name muſt be regarded rather as a modern than an ancient invention. It has been made to differ from the modern Doric by an air of poverty and rudeneſs, by the ſuppreſſion of parts and mouldings. See *Plate* XIV. *Architecture*.

The Compoſite appears never to have been admitted as a ſeparate order by the ancients (ſee Composite *order*). It will, however, be neceſſary to deſcribe what by modern architects has been denominated the Compoſite capital. This is a combination of Ionic and Corinthian forms; the upper part has the ſhape of a modern Ionic capital, and the lower part is ſurrounded with two tier of acanthus leaves. See *Plate* XXVII. *fig.* 4. *Architecture*. Of this capital there are a few examples at Rome.

From the remains of Egyptian antiquity, it appears, that the architects confined to the ſevereſt ſimplicity in the general forms of their buildings and principles of conſtruction, acknowledged no given rules or orders of architecture for the proportions and ornaments of inferior members. Accordingly we find an infinite variety of capitals, many of them poſſeſſing great richneſs of decoration and elegance of outline. The ornaments are in general accurate imitations of the natural productions of the country, ſuch as the lotus, the reed, or the palm. In *Plate* XXVI. *Architecture*, the reader is preſented with various fragments of Egyptian architecture. Here *fig.* 1, is an elegant capital compoſed of the branches and leaves of the palm and the capſules of its fruit. *Fig.* 2, is a bundle of tufts of palm ſtalks, taken in the ſpring when the branches and leaves are not yet unfolded, and the whole tree reſembles a ſingle flower bud. In *fig.* 6, we may obſerve a conſiderable reſemblance to the volutes of the Ionic capital. *Fig.* 8, is a capital from the temple of Tentyra, compoſed of the head of Iſis and the attributes of this goddeſs.

The temples of the ancient inhabitants of Hindooſtan, works of dateleſs antiquity, preſent many capitals of extraordinary form and compoſition. In ſome of theſe we find repreſented the figures of elephants and horſes, apparently crouching under the weight of the ceiling. Capitals very ſimilar in ideas to theſe are alſo found in the ruins of Perſepolis, compoſed of horſes and camels.

As Roman architecture ſunk into the degraded and barbarous ſtyle, known in this country by the name of Saxon and Norman, which was finally ſuperſeded by the mode commonly called Gothic, ancient rules were forgotten or deſpiſed. Ornaments were abandoned to the caprice of the carver, and an endleſs variety of capitals was produced more or leſs happy according to individual taſte or barbariſm. Variety indeed ſeems to have been the governing principle of decoration, and was purſued to an unmeaning exceſs in contempt of ſymmetry, propriety, and congruity.

Capital, in *Chemiſtry*, ſignifies the head of an alembic.

Capital, in French *capitale*, in *Fortification*, of a work, is an imaginary line dividing that work into two equal and ſimilar parts. Every work in a fortification has its capital. The capital of a baſtion, for inſtance, is the right line drawn from the point or ſaliant angle of it to the middle of the gorge, or from the angle of the interior or inward figure, or polygon, to the ſaliant angle of the baſtion, or flanked angle. A baſtion is ſaid to have a certain number of toiſes or fathoms of capital, when there are juſt ſo many in the diſtance from its ſaliant angle to the point where the two demi-gorges meet each other.

The capital of a ravelin or demi-lune is a right line drawn from the re-entering angle of the counterſcarp to the point or to the flanked or ſaliant angle of the ravelin.

Capital *of a Lantern*, the covering which terminates the lantern of a dome, either in the figure of a bell, as that of the Sorbonne; or of a cupola, or a ſpiral, as that of the church of Sapienza at Rome.

Capital *of a Mill*, the covering thereof in form of a cone, which turns vertically on the round tower, in order to expoſe the ſails to the wind.

Capitals, or *Capital letters*, in *Printing*, denote large or initial letters, which are uſed in the titles of books, and on a variety of other occaſions. It was formerly the cuſtom to begin every noun with a capital; but the practice, being troubleſome, and giving to the writing or printing a confuſed appearance, has been diſcontinued. Capitals, however, may very properly commence the firſt word of every book, chapter, letter, note, or any other piece of writing:—the firſt word after a period, and, if the two ſentences are totally independent, after a note of interrogation or exclamation; but if a number of interrogative or exclamatory ſentences are thrown into one general group, or if the conſtruction of the latter ſentences depends on the former, all of them, except the firſt, may begin with a ſmall letter:—the appellations of the Deity:—proper names of perſons, places, ſtreets, mountains, rivers, ſhips:—adjectives derived from the proper names of places:—the firſt word of a quotation, introduced after a colon, or when it is in a direct form; but when a quotation is introduced obliquely after a comma, a capital is unneceſſary:—the firſt word of an example:—every ſubſtantive and principal word in the titles of books:—and the firſt word of every line in poetry. The pronoun I, and the interjection O, are alſo written in capitals. Other words, beſide the preceding, may likewiſe begin with capitals, when they are remarkably emphatical, or the principal ſubject of the compoſition. Murray's Engliſh Grammar, p. 273, ed. 12.

The ancient MSS. both Greek and Latin, are written wholly in capitals.

In the early days of printing, there were alſo ſeveral editions of books in capitals; as of Homer, the Greek Anthology, Apollonius, &c. Johannes Laſcaris ſeems to have brought the ancient printers to give editions in capitals.

CAPITALIS *reflexa*, in *Surgery*. See Capeline.

CAPITAN, an extravagant *fanfaron*, a forward, vain, impudent braggadocio, who boaſts of great exploits, whilſt he is in reality but ſhy, timid, and daſtardly. It is a term ſometimes made uſe of to denote an abſolute coward or poltroon.

CAPITANA, or Captain *galley*, the chief or principal galley of a ſtate, not dignified with the title of a kingdom. The capitane was anciently the denomination of the chief galley of France, which the commander went on board of. But ſince the ſuppreſſion of the office of captain general of the gallies in 1669 they have no capitana, but the firſt galley is called *reale*, and the ſecond *patrone*.

CAPITANATA, in *Geography*, corrupted from Catapanata, denoting the diſtrict under the *Catapan*, or Greek viceroy, the ancient "Apulia Daunia," but detached from "Apulia" by captain Baſilius Bugiano, or Bagiano, one of its Greek governors, and erected by him into an independent province; one of the 12 provinces of Naples. It is bounded on the north and eaſt by the Adriatic, on the ſouth by the provinces of Bari, Baſilicata, and Principato Ultra, and on the weſt by the Moliſe and Abruzzo Citra. The country is for the moſt part level, has few trees and ſprings; the air is hot, and the ſoil ſandy; nevertheleſs the land, refreſhed by dews, and adjoining the rivers, produces corn, and furniſhes paſture for herds of cattle. The ſprings in the country of Manfredonia, near mount Gargano, the chief mountain of the province, are more plentifully ſupplied with freſh water. The ſides of this mountain afford plantations of oranges; the ſtones dug within it are uſed for building in various parts of the province; and from the top is collected ſnow, which is of great ſervice in this hot country. Along the coaſt, which is defended by a number of towers, there are manufactures of ſalt. Its principal towns are Manfredonia, the capital, Vieſti, Lucera, San Severo, Larino, Troja, Termoli, Bovino, Voltarara, and Aſcoli. The extent of this province comprehends 1,141,622 moggie (5 moggie being equal to 4 Engliſh acres), and the number of inhabitants amounts, according to Swinburne, to 491,255.

CAPITANEATE, in a general ſenſe, the ſame with capitania. Capitaneates, in Pruſſia, are a kind of noble feuds, or eſtates, which, beſides their revenue, raiſe their owners to the rank of nobility. They are otherwiſe called *ſtaroſties*.

CAPITANEI, or Catanei, in Italy, was a denomination given to all dukes, marquiſes, and counts, who were called "capitanei regis." The ſame appellation was alſo given to perſons of inferior rank, who were inveſted with fees, formerly diſtinguiſhed by the appellation of *valvaſores majores*. Du-Cange.

CAPITANEUS, Peter, or Capiteyn, in *Biography*, born of a noble family at Middlebourg in Zealand, in the year 1514, received his education in the univerſities of Louvain and Paris. After taking his degree of doctor, he went to Copenhagen, was made profeſſor in medicine, and firſt phyſician to the king, Chriſtian III.; which offices he appears to have held to the time of his death, which happened in the year 1557, as is ſeen by a chronogram engraved on his tomb:

"Occubuit fatis CapItaneUs aLta MICaret,
JanI ſeXta Ubi LUX horaqUe nona foret."

He was alſo honoured with an epitaph by Ant. Balderſleben.

ben. His works are, "De Potentiis Animæ;" printed in 1550, and "Prophylacticum Conſilium anti-peſtilentiale," publiſhed 1553. It was afterwards given by Thos. Bartholine, in his "Ciſta Medica," printed at Copenhagen in 1662.

Capitaneus, in *Conchology*, a ſpecies of Conus deſcribed by Linnæus: the ſhell is conic, glabrous, with fuſcous baſe; and the ſpire ſomewhat convex.

This is an Aſiatic ſpecies. The colours are various, as olive, yellow, fuſcous, cheſnut, or an intermixture of ſome of them, but is very ſcarce of one colour only. Commonly there are one or two whitiſh bands, with numerous rows of dots, and ſquare or undulated ſpots of a darker colour than the prevailing tint of the ſhell. Many intereſting varieties of this ſpecies are figured by Chemnitz, Favanne, and other writers.

Capitaneus, in *Ancient Law Writers*, denotes a tenant in capite, or chief. See Capite.

Capitaneus *Eccleſiæ*, the ſame with *advocate*, which ſee. Du-Cange, Gloſſ. Lat. tom. i. p. 802.

CAPITANIA, the office or dignity of a captain, and more eſpecially a perpetual feud. See Capitaneate.

Capitania is alſo a denomination given to the twelve governments eſtabliſhed by the Portugueſe in Braſil.

CAPITATÆ, in *Botany*, the ninth claſs in Mr. Ray's ſecond method, containing thoſe compound flowers which are united in a roundiſh form, reſembling a head, as the thiſtle, knapweed, &c. It is alſo the ſecond diviſion of the twenty-firſt order in Linnæus's fragments of a natural method publiſhed in the Philoſophica Botanica; the firſt diviſion of the forty-ninth order at the end of the Genera Plantarum, and in the poſthumous prælections; and the ſecond diviſion of the firſt order of the claſs Syngeneſia in his artificial ſyſtem.

CAPITATE, forming a head; applied particularly to a flower, and to the ſtigma.

CAPITATION, a tax, or impoſition, raiſed on each perſon, in conſideration of his labour, induſtry, office, rank, &c. This kind of tribute is very ancient, and anſwers to what the Greeks called επικεφαλαιον; the Latins, *capita*, *capitatio*, and *tributum*, or *tributum capitis*, or *capitulare*. By this term, taxes on the perſon are diſtinguiſhed from taxes on merchandiſe, which were called *vectigalia, quia vehebantur*.

Capitation obtained among the Jews. Accordingly Moſes ordained (Exod. xxx. 30.), that every Iſraelite ſhould pay half a ſkekel "for his ſoul," or perſon, as a redemption, "that there might be no plague among the people, when they were numbered." Several interpreters have ſuppoſed, that this was intended to take place as often as the people were numbered; and that the evaſion of it, when David numbered his ſubjects, incurred the divine puniſhment of a peſtilence. 2 Sam. xxiv. 1. But it has been more generally maintained, that Moſes laid this tax on all the people, payable yearly, for the maintenance of the tabernacle, for the ſacrifices, wood, oil, wine, flour, habits, and ſubſiſtence of the prieſts and Levites. In the time of our Saviour, this tribute was punctually paid. See Didrachma. The rabbins obſerve that even the prieſts and Jews in general, except women, children under 13 years of age, and ſlaves, were liable to pay the half ſhekel, worth about 1s. 6d. The collectors demanded it in the beginning of Niſan, but had no recourſe to compulſion till the paſſover; when they either conſtrained thoſe to pay who had not paid, or took ſecurity from them.

The Iſraelites, on their return from Babylon, paid one-third part of a ſhekel to the temple; as they were, probably, unable, on account of their poverty, to pay a greater ſum. Nehem. x. 32. After the deſtruction of the temple by the Romans, the Jews were compelled to pay the half ſhekel to the temple of Jupiter Capitolinus, which they had before paid to the temple at Jeruſalem. It was levied through all the provinces where any of them were ſettled, and carried by procurators to Jeruſalem. Cicero obſerves, that Flaccus would not ſuffer that tax, which was collected among the Jews in Italy, to be conveyed thither; and Titus, addreſſing the Jews, reproaches them with ingratitude for employing this tax againſt their benefactors, and in carrying on the war with the Romans, which the emperors of Rome had, by a particular indulgence, permitted them to levy. Calmet.

The mode of aſſeſſment under the Roman emperors ſeemed to unite the ſubſtance of a land-tax with the forms of a capitation. The returns which were ſent of every province or diſtrict, expreſſed the number of tributary ſubjects, and the amount of the public impoſitions. The latter of theſe ſums was divided by the former, and the eſtimate, that ſuch a province contained ſo many "capita," or heads of tribute, and that each head was rated at ſuch a price, was univerſally received, not only in the popular, but even in the legal computation. The value of a tributary head muſt have varied, according to many accidental, or at leaſt fluctuating circumſtances; but it is known, that the rapacious miniſters of Conſtantius had exhauſted the wealth of Gaul, by exacting 25 pieces of gold for the annual tribute of every head; which capitation was reduced by the humane policy of his ſucceſſor to 7 pieces. If we take 16 pieces of gold, or about 9l. ſterling, for a kind of moderate proportion between theſe oppoſite extremes of extraordinary oppreſſion and of tranſient indulgence, we ſhall have probably the common ſtandard of the impoſitions of Gaul. When we reflect on this ſubject, it is obvious, that as long as a very unequal diviſion of property muſt ſubſiſt in ſociety, the moſt numerous part of the community would be deprived of their ſubſiſtence by the *equal* aſſeſſment of a tax, from which the ſovereign would derive a very trifling revenue. But, whatever might be the theory of the Roman capitation, in the practice this unjuſt equality was no longer felt, as the tribute was collected on the principle of a *real*, not of a *perſonal* impoſition. Several indigent citizens contributed to compoſe a ſingle *head*, or ſhare of taxation; while the wealthy provincial, in proportion to his fortune, alone repreſented ſeveral of thoſe imaginary beings. Neverthleſs, the difficulty of allowing an annual ſum of about 9l. ſterling, even for the average of the capitation of Gaul, will be more evident by comparing the ſtate of the ſame country, as it was governed by an abſolute monarch of an induſtrious, wealthy, and affectionate people, before the late revolution. The taxes of France, eſtimated at the annual amount of 18 millions ſterling, may be conſidered as diſtributed among 24 millions of inhabitants. Seven millions of theſe, in the capacity of fathers, brothers, or huſbands, might diſcharge the obligations of the remaining multitude of women and children; and yet the equal proportion of each tributary ſubject would ſcarcely riſe above 50s. of our money, inſtead of a proportion almoſt four times as conſiderable, which was regularly impoſed on their Gallic anceſtors. The reaſon of this difference is to be found, not ſo much in the relative ſcarcity or plenty of gold and ſilver, as in the different ſtate of ſociety in ancient Gaul and modern France. In a country where perſonal freedom is the privilege of every ſubject, the whole maſs of taxes, whether they are levied on property or on conſumption, may be fairly divided among the whole body of the nation. But the far greater part of the lands of ancient Gaul, as well as of the other provinces of the Roman world, were cultivated by ſlaves, or peaſants, whoſe dependent condition was a leſs rigid ſervitude. In ſuch a ſtate the poor were maintained at the expence of their maſters; and as the rolls of tribute were filled only with the names of thoſe citizens who poſſeſſed the means of an honourable, or at leaſt of a decent ſubſiſtence, the comparative ſmallneſs of their number explains and juſtifies the high rate of their capitation. The population of the territory of the Ædui might probably amount to 800,000 perſons; and in the time of Conſtantine, this territory afforded no more than 25,000 *heads* of capitation, of whom 7000 were diſcharged by that prince from the intolerable weight of tribute. By a juſt analogy it may be inferred, that the free and tributary citizens did not ſurpaſs the number of half a million; and if their annual payments may be computed at about 4½ millions of our money, it would appear, that although the ſhare of each individual was four times as conſiderable, a fourth part only of the modern taxes of France was levied on the imperial province of Gaul. The exactions of Conſtantius may be calculated at 7 millions ſterling, which were reduced to 2 millions by the humanity or the wiſdom of Julian. But as this tax, or capitation, on the proprietors of land, would have ſuffered a rich and numerous claſs of free citizens to eſcape, the emperors, with the view of ſharing that ſpecies of wealth which is derived from art or labour, and which exiſts in money or in merchandiſe, impoſed a diſtinct and perſonal tribute on the trading part of their ſubjects. Some exemptions, very ſtrictly confined both in time and place, were allowed to the proprietors who diſpoſed of the produce of their own eſtates. Some indulgence was granted to the profeſſion of the liberal arts; but every other branch of commercial induſtry was affected by the ſeverity of the law; nor did the ſovereign of the Roman empire, who tolerated the profeſſion, diſdain even to ſhare the infamous ſalary, of public proſtitutes. This general tax upon induſtry was collected every fourth year, and hence called the "Luſtral Contribution;" and the fatal period was announced by the tears and terrors of the citizens, who were often compelled by the impending ſcourge to embrace the moſt abhorred and unnatural methods of procuring the ſum at which their property had been aſſeſſed. Gibbon's Hiſt. vol. iii. chap. 17.

Capitation taxes, ſays Dr. Smith, (*ubi infra*,) if an attempt is made to proportion them to the fortune or revenue of each contributor, become altogether arbitrary. The ſtate of a man's fortune varies from day to day, and without an inquiſition more intolerable than any tax, and renewed at leaſt once every year, can only be gueſſed at. His aſſeſſment, therefore, muſt in moſt caſes depend upon the good or bad humour of his aſſeſſors, and muſt, conſequently, be altogether arbitrary and uncertain. Capitation taxes, if they are proportioned not to the ſuppoſed fortune, but to the rank of each contributor, become altogether unequal; as the degrees of fortune are frequently unequal in the ſame degree of rank. Such taxes, therefore, if it is attempted to equalize them, become altogether arbitrary and uncertain; but if it is attempted to render them certain, and not arbitrary, they become altogether unequal. In the different poll-taxes which took place in England, during the reign of William III. the contributors were moſtly aſſeſſed according to their rank, as dukes, marquiſſes, earls, viſcounts, barons, eſquires, gentlemen, the oldeſt and youngeſt ſons of peers, &c. All ſhopkeepers and tradeſmen worth more than 300l. were ſubject to the ſame aſſeſſments, whatever might be the difference in their fortunes. Several of thoſe who in the firſt poll-tax were rated according to their ſuppoſed fortune, were afterwards rated according to their rank. Serjeants, attorneys, and proctors at law, who in the firſt poll-tax were aſſeſſed at three ſhillings in the pound of their ſuppoſed income, were afterwards aſſeſſed as gentlemen. In the capitation tax levied in France, for a long time without interruption, ſince the beginning of the laſt century, the higheſt orders of perſons were rated according to their rank by an invariable tariff; the lower orders of people, according to what was ſuppoſed to be their fortune, by an aſſeſſment that varied from year to year. The officers of the king's court, the judges and other officers in the ſuperior courts of juſtice, the officers of the troops, &c. were aſſeſſed in the firſt manner: the inferior ranks of people in the provinces were aſſeſſed in the ſecond.

In England the different poll-taxes never produced the ſum which had been expected from them. In France the capitation always produced ſuch a ſum. The mild government of England, when it aſſeſſed the different ranks of people to the poll-tax, contented itſelf with what that aſſeſſment happened to produce; and required no compenſation for the loſs which the ſtate might ſuſtain either by thoſe who could not pay, or by thoſe who would not pay, and who, by the indulgent execution of the law, were not forced to pay. The more ſevere government of France aſſeſſed upon each generality a certain ſum, which the intendant muſt find as he could. If any province complained of too high an aſſeſſment, it might, in the aſſeſſment of next year, obtain an abatement correſponding to the overcharge; but it was required to pay in the mean time. Capitation taxes, as far as they are levied upon the lower ranks of the people, are direct taxes upon the wages of labour, and are attended with all the inconveniences of ſuch taxes. They are levied at little expence; and where they are rigorouſly exacted, afford a very ſure revenue of the ſtate. Hence, in countries where the care, comfort, and ſecurity of the inferior ranks of people are not objects of much attention, capitation taxes are very common. It is, however, but a ſmall part of the public revenue, which, in a great empire, has ever been drawn from ſuch taxes: and the greateſt ſum, which they have ever afforded might always have been found, ſays Dr. Smith, in ſome other way much more convenient to the people. Wealth of Nations, vol. iii. b. 5. c. 2.

CAPITATUS, in *Ichthyology*, an obſolete name of that fiſh moſt commonly known in England by the name of Miller's thumb, Cottus Gobio, and river bull-head of approved authors.

CAPITE, in *Law*, an ancient tenure, whereby a perſon held of the king immediately, in right of his crown and dignity, either by knight's ſervice, or ſocage, which ſee. This was the moſt honourable ſpecies of tenure; but at the ſame time it ſubjected the tenants to greater and more burthenſome ſervices than inferior tenures did.

By a ſtatute, 12 Car. II. c. 24. all ſuch tenures by knight's ſervice of the king, or of any other perſon, knights' ſervices *in capite*, with all rights, &c. are annulled: and all ſuch tenures are turned into free and common ſocage; ſo that tenures hereafter to be created by the king are to be in common ſocage only, and not by *capite*, knight's ſervice, &c.

Capite *cenſi*, in *Antiquity*, the loweſt rank of Roman citizens, who in public taxes were rated the leaſt of all, being ſuch as were never worth above 365 aſſes.

They were ſuppoſed to have been thus called, becauſe they were rather counted and marſhalled by their heads than their eſtates. Aul. Gell. lib. vii. cap. 13.

The capite cenſi made part of the ſixth claſs of citizens, being below the *proletarii*, who formed the other moiety of that claſs.

The capite cenſi were not enrolled in the army, as being judged not able to ſupport the expences of war; for in thoſe days the ſoldiers maintained themſelves. It does not appear that before Caius Marius any of the Roman generals liſted the capite cenſi in their armies. Salluſt. Jug. p. 135.

CAPITELLUM, in *Conchology*, a ſpecies of Voluta with an ovate, rugged, knotty ſhell, the pillar of which is triplicated.—Murex capitellum of Linnæus. This is about two inches and three quarters in length; colour white, ſometimes faſciated with fuſcous, and marked with decuſſating ribs. This inhabits the Indian and American ſeas.

CAPITO, Wolfgang-Fabricius, in *Biography*, an eminent Lutheran divine, was born in 1478 at Hagenau in Alſace, and having ſtudied at Baſil, became, in compliance with the deſire of his father, a doctor in medicine. He afterwards graduated both in theology and law; and entering in 1520 into the ſervice of cardinal Albert of Brandenburg, elector of Mentz, received from him letters of nobility. After having embraced the opinions of Luther, he formed an intimacy with Bucer and Oecolampadius, and concurred with them in the eſtabliſhment of proteſtantiſm. He aſſiſted at the council of Marpurg in 1529; and after having been twice married died of the plague in 1542. Among the various works which he wrote we may ſelect the following; viz. "Inſtitutionum Hebraicarum lib. ii;" "Enarrationes in Habacuc et Oſeam;" "Vita Joannis Oecolampadii;" "Reſponſio de Matrimonio, et Jure Magiſtratûs in Religionem." Moreri.

Capito, Titinius, lived under the emperor Trajan, and is mentioned by Pliny (l. viii. ep. 12) as a writer of no mean character. He deſcribed the deaths of illuſtrious men, among whom were ſome of his contemporaries, condemned, without doubt, by Domitian.

Capito, Ateius, a celebrated civilian, who adorned the age of Auguſtus and was diſtinguiſhed by the favour of his ſovereign. He was an opponent of Antiſtius Labeo, who was more illuſtrious by his contempt of that favour, and his ſtern, though harmleſs oppoſition to the tyrant of Rome. Their legal ſtudies were influenced by the various colours of their tempers and principles. Labeo was attached to the form of the old republic; his rival embraced the more profitable ſubſtance of the riſing monarchy. Capito, with the tame and ſubmiſſive diſpoſition of a courtier, ſeldom preſumed to deviate from the ſentiments or at leaſt from the words of his predeceſſors; while the bold republican purſued his independent ideas without fear of paradox or innovation. Labeo decided according to the letter of the law the ſame queſtions which his indulgent competitor reſolved with a latitude of equity more ſuitable to the common ſenſe and feelings of mankind. This oppoſition of ſentiments was propagated in the writings and leſſons of the two founders; and the ſchools of Capito and Labeo maintained their inveterate conflict from the age of Auguſtus to that of Adrian. The two ſects derived their appellations from Sabinus and Proculius, their moſt celebrated teachers. Gibbon's Hiſt. vol. viii. p. 31.

Capito, in *Ichthyology*, an old ſynonym of the Chub, Cyprinus Cephalus, which ſee.

Capito is alſo applied by ſome of the elder writers to the Mullet, Mugil Cephalus, which ſee.

Capito, *anadromus*, one of the ſynonyms of Cyprinus Vimba.

Capito *fluviatilis* (Aldrovandus) Cyprinus Dobula, Mull. and Gmelin.

The true ſpecies to which the names *Capito cæruleus*, and *capito rapax* are applied by obſolete writers do not appear to be very clearly aſcertained.

CAPITOL, Capitolium, in *Antiquity*, a famous fort or caſtle, on the Mons Capitolinus at Rome, wherein was a temple dedicated to Jupiter, thence alſo denominated *Capitolinus*, in which the ſenate anciently aſſembled; and which ſtill ſerves as the city-hall, or town-houſe, for the meeting of the conſervators of the Roman people.

It had its name, *capitol*, from *caput*, a man's head, ſaid to have been found freſh, and yet bleeding, upon digging the foundation of the temple, built in honour of Jupiter. Arnobius adds, that the man's name was Tolus; whence *caput-tolium*. Others ſay, that the hill Tarpeius was called capitol, becauſe it was the capital, or chief fortreſs of Rome.

The firſt foundations of the Capitol were laid by Tarquin the Elder, in the year of Rome 139, B. C. 615. In conſequence of a vow which he had made to Jupiter, Juno, and Minerva, on occaſion of his laſt battle with the Sabines, in which he obtained the victory, he levelled the ſteep top of the Tarpeian hill, marked out the plan of the temple, which he had promiſed to erect, and laid the foundation of that glorious ſtructure, which afterwards became the principal place of the Roman worſhip. Hiſtorians have adorned the foundation of this temple with many prodigies, all portending the future grandeur of the Roman empire. As there were ſeveral gods, who had altars on the ſame hill, and which were to be removed to make room for the new edifice, it was a matter of doubt in what part of the hill the foundations ſhould be dug. The augurs reſolved to conſult each deity one after another, and not to touch their altars before they had given their conſent. All the gods agreed that their altars might be removed, except the god Terminus and the goddeſs Youth, who inſiſted upon not being diſplaced; and this circumſtance gave the augurs occaſion to conjecture, that the bounds of the city and empire ſhould ſtand for ever, and that Rome ſhould always flouriſh with youth and vigour. Accordingly the two deities were encloſed within the walls of the temple. Dionyſius Halicarnaſſenſis places this event under Tarquin the Elder, and Livy under Tarquin the Proud. The ſucceſſor of the former, Servius Tullius, as ſome have ſaid, raiſed the walls; and Tarquin the Proud finiſhed it, A. U. C. 221, B. C. 533, having reſerved for this purpoſe the tenths of the ſpoils of Sueſſa Pomatia, one of the moſt wealthy cities of the Volſci, and having procured a great number of workmen from Etruria, to begin the undertaking, who were aſſiſted in the moſt laborious part, by his own ſubjects. But his expulſion from Rome prevented his accompliſhing all his purpoſes. Thus the edifice was not completed and conſecrated till the third year after the expulſion of the kings, and eſtabliſhment of the conſulate. The ceremony of the dedication of the temple was performed by the conſul Horatius, A. U. C. 246; B. C. 508.

The Capitol occupied eight acres of ground; it was 200 feet broad, and about 215 long. It conſiſted of three parts; a nave, ſacred to Jupiter; and two wings, or ailes, to Juno and Minerva. It was aſcended from the forum by ſtairs; Lipſius reckons one hundred in number, becauſe there were ſo many in the aſcent of the Tarpeian rock. The front which looked to the ſouth, facing the hill Palatinus, and the Forum Romanum, and the ſides were encompaſſed with galleries, wherein thoſe, who had the honour of a triumph, entertained the ſenate at a magnificent banquet, after the performance of ſacrifice to the gods. Both inſide and outſide were enriched with numerous ornaments: the ſtatue of Jupiter, with his golden thunderbolt, his ſceptre, and crown, were the moſt diſtinguiſhed. The gilding of the whole arch of the temple of Jupiter Capitolinus was undertaken by the Romans, according to Pliny (lib. xxxiii.) after the deſtruction of Carthage, and if Plutarch (in Octav.)

tav.) may be credited, it coſt 12000 talents. The gates of the temple were of braſs, covered with large plates of gold. The inſide of the temple and the columns which ſupported it, were all of marble.

In the ſame Capitol there were, likewiſe, a temple to Jupiter the Guardian, and another to Juno; with the mint: and on the deſcent of the hill was the temple of Concord.

The Capitol was burnt in the time of Sylla (A. U. C. 670. B. C. 84), by the negligence of thoſe who kept it. He undertook to rebuild it, but did not live to ſee it finiſhed, which he lamented in his laſt illneſs "as the only thing wanting (ſays Tacitus, Hiſt. iii. 72) to complete his felicity." By his death that charge fell to Q. Lutatius Catulus, as being conſul at the time, B.C. 79, who dedicated it with great pomp and ſolemnity, and had the honour to have his name inſcribed on the front. It was burnt a ſecond time in the reign of Vitellius, the 19th of December, A. D. 69, and rebuilt under Veſpaſian, who completed what Helvidius Priſcus had begun. It was burnt again in the reign of Titus, A. D. 80, and rebuilt by Domitian with a ſumptuous magnificence which had no bounds. But it was always re-erected on the old foundations of Tarquin, and its parts, however highly ornamented, preſerved the ſame proportions.

No remains of the ancient ſtructure are now to be ſeen; but the preſent edifice was built on the ſame ſpot by pope Boniface IX. Gregory XIII. and Clement VIII. and at firſt conſiſted of two wings. It was completed by the ſame Clement, Innocent X., and Alexander VII. and is now a very magnificent palace. The roof of it is flat, and adorned with many ſtatues of illuſtrious perſons among the Romans. In the new building reſides the ſenate of Rome, who daily adminiſter juſtice there; and in the wings are the apartments of the conſervators of the city. There is alſo room enough for keeping antiquities and other curioſities which the traveller of taſte has always admired. The "Camera apoſtolica," or apoſtolic chamber, has now uſurped the rights of the famous "Senatus Populuſque Romanus." In the front of this building is a high tower, with the ſtatue of religion erected on the top of it. The double flight of ſteps at the entrance of this palace is the work of Michael Angelo, who likewiſe adorned the front with a ſuperb fountain, and two ſtatues repreſenting the Nile and the Danube in a reclining poſture. In the centre is a porphyry ſtatue of Rome, in the habit of Minerva, and the uſual ſymbols of the helmet and ſpear, but ſitting. This is a piece of great antiquity, and much admired by connoiſſeurs. The large hall, where the court of juſtice is held by the ſenators, was formerly adorned with ſeveral pictures, repreſenting the achievements of the kings of the Romans; but none of them now remain; Clement XI. having, in 1712, ſupplied their places with a great number of deſigns, exhibiting the life of pope Pius V. and his canonization. Under the "Corps de Logis" is the capital priſon. In the apartments of the conſervators, in the left wing, are two celebrated ſtatues of Julius Cæſar and Auguſtus, both antiques and of white marble. The former, as ſovereign of the world, holds a globe in his hand; the latter, a roſtrum or beak of a ſhip, alluding to his victory over Mark Antony and Cleopatra. Near theſe ſtatues are to be ſeen two feet and a hand of oriental marble, being part of a coloſſus or ſtatue of Apollo, which was 30 ells in height, and ſent by Marcus Lucullus from Apollonia to Rome, where it was placed on the Capitoline mount. Oppoſite to this is the head of the Coloſſus. Here are alſo another large head and hand of braſs, ſuppoſed to have belonged to a coloſſus of Commodus or Domitian. Near the inſcription on Agrippina's monument is an admirable ancient groupe, repreſenting a lion tearing to pieces a horſe; but the horſe is much damaged by time. This admired piece was found on the banks of the Tiber, near the Oſtia gate, in the time of Paul III. Here is alſo a very remarkable piece of architecture, in which five pieces of ſculpture are conjoined, which had originally no connection, and were dug up in different places. In the centre, and elevated above the reſt, ſits Rome triumphant, in white marble, with a poniard in her left, and a branch of palm in her right hand; and on the front of the baſe, on which ſhe ſits, is a woman in tears, repreſenting Dacia, or ſome other conquered province. On each ſide of this ſtatue is the coloſſus of a barbarian prince in a kind of black marble, called "baſaltes." Their rank may be known by their diadems. The workmanſhip is exquiſite; but it is not known who they are. Here is alſo the marble ſarcophagus of the emperor Alexander Severus and his mother Julia Mammæa, found on Monte del Grano, near Freſcati, and brought hither. It is ſix feet long, and ſix broad. Not far from this is a marble coloſſal ſtatue of Conſtantine the great, which ſhews that the art of ſculpture was upon the decline, though the two muſes are good pieces, as is alſo a prieſteſs of Bacchus. Near the ſtairs is a very remarkable antique, viz. the "columna roſtrata," which is of Parian marble; erected in the year of Rome 494, in honour of the conſul Caius Duilius, on account of a naval victory, which he obtained over the Carthaginians. Near it is a baſſo-relievo, repreſenting Curtius leaping into the abyſs. At the firſt landing place are ſeen two antique muſes; and a little farther, four admirable baſſo-relievos, repreſenting the triumph of Marcus Aurelius and Lucius Verus, which belonged to their triumphal arch in the Corſo. Before the entrance of the great hall is a large ſturgeon, 6½ ſpans long, cut in white marble; the head of every fiſh of this ſpecies, exceeding that meaſure, being due to the conſervators of the city. On the left hand are the Faſti conſulares, down to the time of the emperor Pertinax, engraved on marble; and above theſe is a baſſo-relievo of the wolf ſuckling Romulus and Remus. Farther in are the names of the modern conſervators. In the firſt hall are ſome paſſages of the Roman hiſtory, painted by Gioſeppi d'Arpino; as, the rape of the Sabines, the combat betwixt the Horatii and Curatii, Romulus and Remus ſucking the ſhe-wolf, and the building of the city of Rome, &c. &c. But the moſt admired of all is the victory of Tullius Hoſtilius over the Veji and the Fidenates. There are various other marble ſtatues and paintings in the different apartments, which it would exceed our limits to mention, but which muſt be highly gratifying to the curious.

From ſeveral remains of ancient walls, it is conjectured by ſome, that the temple of Jupiter Capitolinus ſtood on the ground which is at preſent incloſed in the court of the Caffarelli palace. The famous Tarpeian rock is now almoſt covered with buildings; but it is evident that anciently the rock muſt have been much ſteeper, or a wall muſt have been erected upon it, from which malefactors were thrown down headlong. That the height or depth of it has not undergone any conſiderable alteration may be concluded from Severus's triumphal arch at the foot of the Capitoline-hill, which, with the amphitheatre in its neighbourhood, is not above two or three feet below the preſent ſurface of the ground. See Keyſler's Travels, vol. ii.

Anciently, the name capitol was likewiſe applied to all the principal temples, in moſt of the colonies throughout the Roman empire: as, at Conſtantinople, Jeruſalem, Carthage, Ravenna, Capua, &c.

CAPITOLIA, or ÆLIA CAPITOLIA, in *Ancient Geography*, a name given to Jeruſalem in the time of Ptolemy.

CAPITOLIAS, a town of Aſia in Cœloſyria, N. of Adraa, according to Ptolemy; between Adraa and Gadara, according to the table of Peutinger; and in Antonine's route from Seriana to Scythopolis, between Neva and Gadara.

CAPITOLINE *Games*, *Ludi* Capitolini, were annual games, or combats, inſtituted by Camillus, in honour of Jupiter Capitolinus; and in commemoration of the Capitol's not being ſurpriſed by the Gauls.

Plutarch tells us, that a part of the ceremony conſiſted in the public cryer's putting up the Hetrurians to ſale by auction: they alſo took an old man, tying a golden bulla to his neck, ſuch as were worn by their children, and expoſed him to the public deriſion. Feſtus ſays, they dreſſed him in a prætexta, and hung a bulla at his neck: not as accounting him a child, but becauſe this was an ornament of the kings of Hetruria.

There was alſo another kind of capitoline games, called *agones capitolini*, inſtituted by Domitian, A.U.C. 839, A.D. 86, and celebrated each fifth year; wherein there were rewards and crowns, or garlands of oak-leaves, beſtowed on the victorious poets, and put on their heads by the emperor himſelf. As the manner and plan of the capitoline games were taken more from the Greeks than from the Romans, Domitian preſided in them, dreſſed after the Greek faſhion, and wearing a crown of gold, in which were ſet the images of Jupiter, Juno, and Minerva. He was attended by the prieſt of Juno, and the college of prieſts, which he himſelf had inſtituted in honour of the Flavian family; all dreſſed like himſelf, except that they wore an image of the emperor in their crowns. If the crowns were given to ſuperior merit, the excluſion of Statius, (Capitolia noſtræ inficiata lyræ, Silv. l. iii. v. 31.) may do honour to the games of the Capitol; however, though he could not obtain the prize at theſe games, he was crowned three times at thoſe of Minerva, in honour of whom Domitian celebrated a feaſt every year, in his houſe at Alba, with great pomp and magnificence. Theſe games, which were not aboliſhed in the 4th century, became ſo celebrated, that the manner of accounting time by luſtres, which had obtained till then, was changed; and they began to count by capitoline games, as the Greeks did by olympiads. The feaſt was not for poets alone, but alſo for athletæ, orators, hiſtorians, comedians, muſicians, &c.

Capitoline *Marbles*. See Fasti.

CAPITOLINI, in *Roman Antiquity*, a college of men reſiding in the capital and arx, to whom was committed the care of celebrating the capitoline games.

CAPITOLINUS, Julius, in *Biography*, a Latin hiſtorian, flouriſhed at the cloſe of the third, and beginning of the fourth century, and wrote the lives of the emperors Antoninus Pius, Verus, Albinus, Macrinus, the two Maximins, and the three Gordians. Theſe are extant, but ſome other of his compoſitions are loſt. His matter is chiefly copied from Herodian, and he is deemed neither a pure nor an exact writer. Voſſ. Hiſt. Latin.

CAPITOUL, or Capitol, an appellation given to the chief magiſtrates of Toulouſe, who have the adminiſtration of juſtice and policy both civil and mercantile in the city.

The capitouls at Toulouſe are much the ſame with the echevins at Paris, and the conſuls, bailiffs, burgher-maſters, mayors, and aldermen, &c. in other cities. In ancient acts they are called *conſules capitularii*, or *capitolini*, and their body *capitulum*. From this laſt come the words *capitularii* and *capitouls*. The appellative *capitolini* aroſe hence, that they have the charge and cuſtody of the town-houſe, which was anciently called capitol. The office only laſted one year, and ennobled the bearers. In ſome ancient acts they are called *capitulum nobilium Toloſæ*. Thoſe who have borne it, ſtyled themſelves afterwards burgeſſes. They were called to all general councils, and had the *jus imaginum*; that is, when the year of their adminiſtration expired, their pictures were drawn in the town-houſe; a cuſtom which they retained from the ancient Romans, as may be ſeen in Sigonius.

CAPITOULATE, an appellation given to the ſeveral quarters or diſtricts of the city of Toulouſe, each under the direction of a capitoul; much like the wards of London under their aldermen.

Toulouſe is now divided into eight capitoulates, or quarters, which is ſubdivided into *moulans*, each of which has its tithing-man, whoſe buſineſs is to inform the capitoul of what paſſes in his tithing, and to inform the inhabitants of the tithing, of the orders of the capitoul. See Toulouse.

CAPITULA Ruralia, denote chapters held by the rural dean and clergy within the precincts of each deanery, anciently held every three weeks, then once a month, and more ſolemnly once a quarter.

CAPITULAR, or Capitulary, denotes an act paſſed in a chapter, either of knights, canons, or religious.

The capitularia, or capitulars of Charlemagne, Charles the Bald, &c. are the laws, both eccleſiaſtical and civil, made by thoſe emperors in the general councils, or aſſemblies of the people: which was the way in which the conſtitutions of moſt of the ancient princes were made; each perſon preſent, though a plebeian, ſetting his hand to them.

Under the French monarchs of the firſt race, the general aſſemblies of the nation met annually at ſtated ſeaſons, and extended their authority to every department of government. The power of electing kings, of making laws, of redreſſing grievances, of paſſing judgment in the laſt reſort, with reſpect to every perſon and to every cauſe, and of conferring donations on the prince, reſided in this great council of the nation. Under the ſecond race of kings, notwithſtanding the power and ſplendour which the conqueſts of Charlemagne added to the crown, the general aſſemblies of the nation continued to poſſeſs extenſive authority. The right of determining which of the royal family ſhould be placed on the throne, was veſted in them. The princes elevated to that dignity were accuſtomed regularly to call and conſult them with reſpect to every affair of importance to the ſtate, and without their conſent no law was paſſed, and no new tax was levied. Theſe aſſemblies of the nation, diſtinguiſhed by the name of Conventus, Malli, Placita, were regularly convened once a year at leaſt, and frequently twice in the year. The nobles, the dignified eccleſiaſtics, and the great officers of the crown, were not the only members of the national council; the people, or the whole body of freemen, either in perſon, or by their repreſentatives, had a right to be preſent in it. Monteſquieu indeed, in his "Spirit of Laws," (vol. ii. p. 248), ſays, that under the firſt and ſecond race, the nation was often aſſembled; that is, the lords and biſhops; and that the commons were not yet thought on. But it appears from Hincmarus, archbiſhop of Rheims, and Agobardus, archbiſhop of Lyons, cited by Dr. Robertſon, in his "Hiſtory of Charles V." (vol. i. p. 438), that the people, as well as the members of higher dignity, formed a part of theſe aſſemblies, and participated in the legiſlative power. Thus, by a law, A.D. 803, it is ordained, "that the queſtion ſhall be put to the people with reſpect to every new law, and if they ſhall agree to it, they ſhall confirm it by their ſignature." Capit. vol. i. 394. There are two capitularia, which convey to us a full idea of the part which the people had in the adminiſtration of government. When they felt the weight of any grievance, they had a right to petition the ſovereign for redreſs. One of theſe petitions is ſtill extant: it is addreſſed to Charlemagne, A. D. 803, and expreſſed in ſuch terms as could have been uſed only by men conſcious of liberty, and of the extenſive privileges which they poſſeſſed. They concluded with requiring him to grant their demand, if he wiſhed that they ſhould any longer continue faithful ſubjects to him. This great monarch made no remonſtrance, but ſignified his willingneſs to comply; and ſenſible that he himſelf did not poſſeſs legiſlative authority, he promiſes to lay the matter before the next general aſſembly, that ſuch things as were of common concern to all might be then conſidered and eſtabliſhed by common conſent. Capitul. tom. i. p. 405—409. As the people by their petitions brought matters to be propoſed in the general aſſembly, we learn from another capitular, the form in which they were approved there, and enacted as laws. The propoſitions were read aloud, and then the people were required to declare whether they aſſented to them or not. They ſignified their aſſent by exclaiming three times, "we are ſatisfied;" and then the capitulare was confirmed by the ſubſcription of the monarch, the clergy, and the chief men of the laity. Capitul. tom. i. p. 627. A. D. 822. From a capitulare of Carolus Calvus, A. D. 851, it ſeems probable, that the ſovereign could not refuſe his aſſent to what was propoſed and eſtabliſhed by his ſubjects in the general aſſembly. Tit. ix. §. 6. Capitul. vol. ii. p. 47.

Some diſtinguiſh the capitulars from laws; and ſay, they were only ſupplements to laws.—They had their name, *capitulars*, from their being divided into *capitula*, chapters or ſections. In theſe capitulars did the whole French juriſprudence anciently conſiſt. In proceſs of time, the name was changed for that of ordonnances.

The weakneſs of the greater part of the monarchs of the ſecond race, and the diſorder into which the nation was thrown by the depredations of the Normans, encouraged the barons to uſurp an independent power formerly unknown in France. The political union of the kingdom was at an end, its ancient conſtitution was diſſolved, and only a feudal relation ſubſiſted between the king and his vaſſals. The regal juriſdiction extended no farther than the domains of the crown. Under the laſt kings of the ſecond race, they were reduced almoſt to nothing. Under the firſt kings of the third race, they comprehended little more than the patrimonial eſtate of Hugh Capet, which he annexed to the crown. All theſe circumſtances rendered it eaſy for the barons to uſurp the rights of royalty within their own territories. Hence, the capitularia became no leſs obſolete than the ancient laws: local cuſtoms were every where introduced, and became the ſole rule by which all civil tranſactions were conducted, and all cauſes were tried. The wonderful ignorance which became general in France, during the 9th and 10th centuries, contributed to the introduction of cuſtomary law. Few perſons, except eccleſiaſtics, could read; and as it was not poſſible for them to have recourſe to written laws, either as their guide in buſineſs, or their rule in adminiſtering juſtice; the cuſtomary law univerſally prevailed. Another circumſtance that greatly contributed to the diſuſe of the capitularies, as well as of the Salic and Roman laws, was the great extent given at this time to judiciary combats. During this period, the general aſſembly of the nation ſeems not to have been called, nor to have once exerted its legiſlative authority. Local cuſtoms regulated and decided every thing. The laſt of the capitularia collected by M. Baluze, was iſſued in the year 921, by Charles the Simple. One hundred and thirty years elapſed from that period to the publication of the firſt ordonnance of the kings of the third race, contained in the great collection of M. Lauriere; and the firſt ordonnance, which appears to be an act of legiſlation, extending to the whole kingdom, is that of Philip Auguſtus, A. D. 1190; and the ordonnances previous to this reign, contain regulations, the authority of which did not extend beyond the king's domains. See ORDONNANCE. Baron Monteſquieu obſerves, (Sp. of Laws, vol. ii. p. 250.) that there were ſeveral ſorts of capitularies. Some had relation to political government, others to economical, moſt of them to eccleſiaſtical polity, and ſome few to civil government. Thoſe of the laſt ſpecies were added to the civil law, that is, to the perſonal laws of each nation; for which reaſon, it is ſaid in the capitularies, that there is nothing ſtipulated therein contrary to the Roman law. In reality, thoſe capitularies that regarded economical, eccleſiaſtical, or political government, had no relation to that law; and thoſe concerning civil government had reference only to the laws of the barbarous people, which were explained, amended, enlarged, and retrenched. But the addition of theſe capitularies to the perſonal law, occaſioned, as Monteſquieu conceives, the neglect of the very body of the capitularies themſelves: as in times of ignorance, the abridgment of a work often cauſes the loſs of the work itſelf. Anſegiſe is ſaid to have made the firſt collection of regulations contained in the capitulars of Charlemagne and Louis le Debonnaire; which collection is divided into four books, and has been approved by Louis le Debonnaire, and Charles the Bald. After him, Benoit collected, about the year 845, the capitulars of theſe two emperors, omitted by Anſegiſe, and annexed to them the capitulars of Carloman and Pepin. This collection is divided into three books, which comprehend, with the four preceding, the ſeven books of the capitulars of the French kings: the ſix firſt of theſe were publiſhed by du Tillet in 1548, and the whole collection of ſeven books by M. M. Pithou. Father Sirmond has publiſhed ſome capitulars of Charles the Bald; and at length, M. Baluze printed a complete edition of the capitulars in 2 vols. fol. at Paris in 1677. This contains the capitulars of the French kings, and the collections of Anſegiſe and Benoit, together with ſome other pieces.

The biſhops alſo in the 8th and following centuries gave the name of capitula and capitulars to the regulations which they enacted in their ſynodal aſſemblies, with regard to eccleſiaſtical diſcipline, deducing them from the canons of councils, and the works of the fathers. Theſe regulations had the force of laws only in the dioceſe of the prelate who publiſhed them, unleſs they were approved by a council, or the metropolitan; in which caſe, they were obſerved through the whole province. Of this kind are the collections of Martin, archbiſhop of Braga, in the year 525; thoſe of pope Adrian I., given to Angilram, or Enguerran, biſhop of Metz, in 785; thoſe of Theodulphus, biſhop of Orleans, in 767; thoſe of Hincmar, archbiſhop of Rheims, in 852; thoſe of Herard, archbiſhop of Tours, in 858; and thoſe of Iſaac, biſhop of Langres. Doujat, Hiſt. du Droit canon. Baluze, Præf ad Capit. M. du Pin. Eccl. Ant. of the 8th century.

CAPITULATION, in *Military Language*, a particular convention, agreement, compact, or treaty between two powers. Thus, one power makes a capitulation with another to furniſh him with troops on condition of ſubſiſtence, pay, and certain privileges, or for other military ſuccours or aſſiſtance. A corps or body of troops conſtrained to ſurrender themſelves makes a capitulation with that, which forces it to do ſo. A governor or commandant of a place beſieged enters into a capitulation with the general of the beſieging army when he is under the neceſſity of delivering it up.

The ſurrender of a place by capitulation is juſtifiable and honourable, or otherwiſe, in proportion to the ability, ſkill, perſeverance, and valour, with which it has been defended.

Many governors truſting too much to their courage and the vigour of their arms are negligent in making themſelves acquainted with, and practiſing the means of enabling them to defend the places entruſted to their care as long and obſtinately as poſſible, and to the beſt advantage. This knowledge, however, is of the firſt importance, and highly eſtimable. They think they fulfil and diſcharge their duty ſufficiently if they expoſe their own lives on all occaſions, either offering themſelves or ſought for. The examples of ſeveral places, which, though taken through want of good conduct, have nevertheleſs been defended with a conſiderable degree of valour and eclat, are apt to lead them into this error. But they would have no reaſon to dread the blame that might attach to their ſurrendering ſooner than they ought, were they to add to their valour that knowledge of defence, which they but too often neglect to acquire.

They believe, that when their outworks are taken, and the miner is attached to the body of the place, or at the moſt, if the baſtion be at all opened, or a breach made in it, they may ſurrender and capitulate with honour after appearing ſword in hand on the top of the breach at the head of a battalion, that does not fight but only faces the fire of the cannon and muſquetry of the attack, and then retires from the breach behind ſome trifling and weak retrenchment, that appears to have been made more for the capitulation of the troops than for the defence of the place. Such prompt capitulations are ſometimes occaſioned and brought about by the reaſonings and importunity of the other officers, who urged by ſelf-intereſt wiſh to preſerve the little baggage and effects that belong to them, and preferring the preſervation of them to their real glory, perſuade the governor, who for particular reaſons of his own wiſhes alſo perhaps to be perſuaded, that he may capitulate with honour; that it is much better to ſecure by a voluntary treaty the liberty of the inhabitants and to march out drums beating, colours flying, arms loaded, *balle en bouche* to reload them with, matches lighted, and with ſome pieces of cannon, their baggage and effects, than to await an approaching extremity and to run the riſk of being ſtormed or having the place carried by force. They repreſent to him, that one part of the ſoldiers are wounded, that others are ſick, and that thoſe, who are ſtill in a condition for ſervice, are diſcouraged and diſheartened; that their long watchings, their ſevere fatigues and ſufferings, well entitle them to his moſt ſerious attention to their ſafety and preſervation. By urging theſe and many ſuch other bad reaſons, they endeavour to make him form the reſolution, which he has himſelf perhaps already taken, of capitulating, and of which he is probably well pleaſed in his own mind, that they have made him the overture or propoſal, ſince, after ſome formalities, he concludes with them on ſurrendering up the place; as if a baſtion, that is not perhaps bared or ſtripped of its revetement in more than one ſpot, furniſhed a free and eaſy entrance to the enemy, or as if the ſtate to which the place belongs had gone to the expence of erecting the works and reveting the ramparts for no other purpoſe than that of procuring ſuch a capitulation, as troops often make in ſmall and bad redoubts, and ſometimes in the open field. Such conduct is baſe and diſhonourable, and ſuch ideas are grafted on ignorance of the proper method of defending works by means of retrenchments one after another, which is not only poſſible but practicable; and every governor or commandant, that underſtands and does his duty, will put in practice.

Many and numerous, indeed, are the contrivances for rendering the defence of a fortified place long and ruinous to the beſieger, if the governor and other officers of it were better inſtructed in their duty than they commonly are, and would ſacrifice their intereſt to their glory and the good of their country. The governor or commandant of ſuch a place, beſides doing the utmoſt in his power to have it at all times ſupplied with a ſufficiency of troops, proviſions, artillery, ammunition, medicines, and every thing elſe, that is neceſſary for the ſupport and comfort of the garriſon in order to enable him to defend it properly and ſtand a ſiege, he ſhould before it is inveſted or even expected to be beſieged, take care that there are no ditches, fences, buildings, or any thing elſe within cannon-ſhot of the glacis or covert way, that can ſerve to cover the enemy from his view, or ſhelter them in opening their trenches. He ſhould have every ditch filled up, every fence and tree cut down, and even every little eminence or riſing ground within that diſtance levelled if poſſible. Many of the governors, however, and principal officers of ſuch places act in time of peace as if they ſuppoſed they were never to be inveſted, and totally neglect their environs. They permit the inhabitants to make gardens, to ſurround theſe with ditches and fences, to plant trees, and even to erect buildings within cannon-ſhot of their works; and the moment an enemy appears before the ſame they are often ſo ignorant of their duty as to attempt to cannonade him and to throw their ſhot at him to as great a diſtance as they are able, as if they wiſhed to facilitate his enterpriſe or to aid and aſſiſt him in the execution of his deſign by pointing out to him the very ground where he ought to form his encampment, and the diſtance at which he ſhould open his trenches and commence the attack. The beſieged, however, remaining quiet inſtead of purſuing ſuch injudicious conduct, is uſually attended with one or other of the two following advantageous circumſtances; namely, that the beſiegers fix their camp either too near to the place, or farther from it than is neceſſary. If it be too far off, the line of circumvallation becomes too extenſive, and is of courſe leſs calculated than it otherwiſe might be for preventing ſuccours from getting into the place. And if, on the other hand, it be too near, the beſiegers after ſome days when the cannon of the place begin to fire on them will be obliged to move it farther off; by which means the line of circumvallation muſt be commenced anew, and their time and labour will be loſt, which, at the beginning of a ſiege, is all that the beſieged can expect or deſire.

As it is cuſtomary for the enemy a day or two after the opening of the trenches and ſometimes on the very ſame day to advance in order to reconnoitre the places moſt convenient or commodious for the attack, and as this reconnoitring is often performed by the general of the beſieging army himſelf, that he may know what reſolution to take reſpecting it; the governor or commandant of the place ſhould take particular care that none of his people are made priſoners. For even the moſt ignorant of them might furniſh uſeful intelligence to the enemy.

When the beſieging army is weak he may ſend out a large body of troops to keep them at a diſtance by means of muſquetry. But when it is ſtrong, he ſhould not leave without the place, but a ſmall number of cavalry or infantry, with directions by a feigned retreat to draw the enemy into a ſituation that will expoſe them to the fire of the works if they attempt to approach and charge them.

The governor or commandant of a fortified place ſhould know how to counteract and protract the operations of the beſiegers by means of counter-approaches, by ſorties or ſallies, by mines, &c.; all which he ought to make uſe of and put in practice, diſputing every inch of ground, as well as various contrivances for rendering breaches impracticable after they appear to be practicable to the enemy, before he ſeriouſly thinks of capitulating. Before the place, intruſted to his care, is actually attacked, he ſhould frequently weigh and ponder in his own mind every poſſible or practicable method of attacking it, that he can imagine or conceive, and then endeavour to find out as many different ſorts of defence for counteracting and prolonging them. Such mental reflection and examination would render it almoſt impoſſible for any occurrence to take place during a ſiege, that he had not already thought of, or that did not at leaſt bear ſome reſemblance to what he had thought of, and would enable him to draw from this likeneſs or ſimilitude prompt reſources and expedients.

The articles of capitulation are propoſed by the governor or commandant of the place beſieged, who receives hoſtages for the ſafety and ſecurity of thoſe, whom he ſends to the general of the enemy. It is cuſtomary to give hoſtages of equal rank reciprocally.

The ſtipulation of the articles propoſed, the alteration, modification, or refuſal of ſome of them, is governed by a variety of conſiderations depending on the views and knowledge or information of the general, who conducts the ſiege.

When the articles are ſigned, the beſiegers take poſſeſſion of ſome poſt, or of a front attacked, according as it is agreed on.

When the time arrives, at which the garriſon is to march out, it is uſual to introduce into the place by way of honour and diſtinction the oldeſt corps of the army of the beſiegers, which occupies poſts for guarding it; and after the beſieged have left it, thoſe corps are marched into it, that are intended to garriſon it.

The examination of the artillery, ammunition, ſtores, and proviſions, that ought to remain in the place agreeably to the capitulation, precedes the going out of the garriſon which is always done in concert by the officers of artillery, ſtore-keepers, and commiſſaries, who exchange ſigned accounts, or ſtatements and diſcharges, from which the general gives orders for providing the place with what is wanted.

The troops, that march out, receive an eſcort ſufficient for conducting them ſafe to the place appointed by the capitulation; an article, which of all others is in general moſt religiouſly obſerved.

After the marching out of the garriſon, the firſt object of attention is the levelling and deſtruction of the works that were erected or thrown up for the attack of the place, and the repairing of all thoſe, that were injured or damaged by the ſame. The beſieging army, indeed, ought not to quit their lines after the place capitulates till they have filled them up, and either removed their heavy artillery into the place, or ſent it elſewhere with whatever is not neceſſary for its defence. Then they may leave them either for the repoſe and refreſhment of the troops fatigued with the ſiege, or for the convenience of ſubſiſtence, or to execute the remaining part of the plan of the campaign.

When the governor or commandant of a fortified place, after having made every practicable preparation for, and exhauſting all his means of defence, is reduced to the neceſſity of capitulating, in order to obtain as favourable conditions as he poſſibly can both for his garriſon and for the inhabitants, he orders one or more drummers to repair to that part of the rampart, which is next to the attack, and to give notice to the beſiegers, by beating the *chamade*, that he has ſome propoſals to make. For the ſame purpoſe one or more white colours are ſet up on the rampart, and one of them remains either on it or on the breach during the negociation. The ſame formality is obſerved, when after a violent attack a ſuſpenſion of arms is demanded, either for the purpoſe of burying the dead or for carrying off the wounded.

After the beating of the *chamade*, the governor or commandant ſends ſome officers of diſtinction to the commander in chief of the beſiegers to deliver to him the conditions, on which he propoſes to ſurrender up the town, place, or city. As a ſecurity, however, for the officers ſent from the garriſon, the beſiegers ſend an equal number generally of the ſame rank into the place. When the governor's propoſals are not ſatisfactory to the general of the beſieging army, he on his part preſcribes the conditions, on which he expects it to ſurrender, commonly threatening to allow the governor no terms whatſoever in caſe he do not accede to thoſe preſcribed within a certain time, or before ſuch or ſuch a work ſhall be finiſhed. If the beſieged find the terms or conditions inſiſted on by the beſiegers to be too hard or rigorous, the officers ſent to them return to the beſieging army, and thoſe ſent by them return into the garriſon. The drummers are directed to beat their drums upon the rampart, that every one may have timely notice to retire before hoſtilities recommence, which they do very ſoon afterwards. During the negociation or ſuſpenſion of arms no work ought to be erected or even repaired, either by the beſieged or by the beſiegers. It is neceſſary, however, to be on the watch at that time as much as at any other, and ſtrictly to guard every point liable to be attacked, to prevent any ſurpriſes by ſtratagem, which are regarded as warrantable and lawful.

But if the terms or condicions of the capitulation be agreed on, the governor or commandant ſends two or three of his principal officers into the camp, and the beſieging general ſends the ſame number of officers of equal rank into the place, as a ſecurity for its accompliſhment. When the beſieged have performed every thing agreeably to the compact or treaty, their hoſtages are ſent back to them, as are thoſe of the beſiegers as ſoon as the terms, they agreed to, are complied with.

The terms or conditions of a capitulation vary with circumſtances and ſituations; but they are generally to the following purport.

1. The garriſon ſhall march out through the breach with their arms, baggage, horſes, drums beating, matches lighted at both ends, *balle en bouche*, colours flying, a certain number of pieces of cannon and mortars, with their appurtenances, ſpare carriages, ammunition for a certain number of charges; to be conducted in ſafety *by the ſhorteſt road*, or by a ſpecific route, to the neareſt town or place belonging to the beſieged, and if the diſtance be ſo great as to require a march of ſeveral days, to be provided with proviſions and lodgings during that time.

2. That one of the gates ſhall be delivered up to the beſiegers the evening of the day on which the capitulation or convention is ſigned, or at a certain hour next day, and that the garriſon ſhall march out a day or two after, according to agreement.

3. The beſiegers ſhall furniſh a certain number of covered waggons, which are not to be ſearched, beſides others for carrying the wounded and ſick that are in a condition to be tranſported, and in general all the carriages and horſes neceſſary for removing the garriſon's baggage, and the artillery allowed by the capitulation.

4. That the ſick and wounded who cannot be removed or carried off, and are obliged to be left behind in the place,

ſhall have free liberty to go away, with every thing that belongs to them, when they are in a condition to do ſo; and they ſhall in the mean time be furniſhed with lodgings, and with proviſions, *gratis*, or *otherwiſe*, and have every ſort of medical aid or aſſiſtance that can well be afforded to them.

5. There ſhall be no indemnification required from the beſieged for any horſes taken from the inhabitants, or for any houſes burnt or deſtroyed during the ſiege.

6. The governor or commandant, the officers under him, and thoſe belonging to the garriſon, the garriſon itſelf, and in general every one in the king's, prince's, or ſtate's ſervice, ſhall freely quit the place without repriſals of any kind.

7. That the inhabitants ſhall exerciſe their religion according to their accuſtomed forms of worſhip, without hindrance or moleſtation.

8. The inhabitants, both of the place and its dependencies, ſhall be maintained in all their rights, privileges, and prerogatives.

9. Thoſe that chooſe to leave the place ſhall have free liberty to go whither they pleaſe with their effects; and ſuch of the inhabitants as have ſhewn a partiality to the garriſon, or aſſiſted them during the ſiege, ſhall not be moleſted on that account.

10. All the remaining powder and ammunition ſhall be delivered up to the beſiegers, and the loaded mines ſhall be ſhewn and pointed out to them.

11. All the priſoners made on both ſides during the ſiege ſhall be releaſed.

A garriſon ſhould have a ſufficiency of proviſions and ammunition to laſt for three days to entitle them to a convention or capitulation. But if they have not near ſo much of either, at the ſigning of the capitulation, they cannot in juſtice be afterwards regarded as priſoners of war, becauſe the beſiegers were not at the time acquainted with the circumſtance.

If the beſiegers will not agree to any other ſtipulation than the beſieged's being made priſoners of war, and the garriſon is not in a condition to hold out any longer, it is generally endeavoured to render the conditions as little burthenſome and rigorous as poſſible; ſuch, for inſtance, as the following:

1. That the governor or commandant, and the principal officers, ſhall keep their ſwords, piſtols, baggage, &c.

2. That the ſubalterns ſhall keep their ſwords and baggage.

3. That the common men ſhall not be rifled or diſperſed about from their regiments.

4. That the garriſon ſhall be conducted by the ſhorteſt road to a certain place, and there remain priſoners of war.

5. That the principal officers ſhall have leave for a few days to go where they pleaſe to ſettle their affairs.

6. When the garriſon quits the place, no attempts ſhall be made to debauch the ſoldiers, or to encourage them to deſert from their regiments.

When the capitulation is ſettled and ſigned, an officer of artillery from the beſiegers comes into the place, who, with an officer of artillery from the garriſon, takes an inventory of all the ordnance and ammunition in it; and commiſſaries, in like manner, take an account of all the proviſions.

The beſieged may deſtroy magazines before, but not after they have made any propoſition for a capitulation.

When the day arrives on which the garriſon is to leave the place, the army of the beſiegers is put under arms, and ranged in two files, between which the garriſon marches. The general and the principal officers head the two files, to ſee the garriſon defile before them.

The governor or commandant marches at the head, followed by the principal officers, who make the garriſon march in as good order as poſſible. The oldeſt regiments are commonly in the van and in the rear, and the others, with the baggage, in the centre. When there are any horſe or cavalry, they are alſo divided into three bodies, to march as the van, centre, and rear. Small detachments of horſe and foot are made to march at the ſides of the baggage, to prevent its being rifled.

The artillery allowed by the capitulation march after the firſt battalion.

When the garriſon arrives at the place agreed on, the governor gives up the hoſtages of the beſiegers to the eſcort; and when the eſcort reaches the army, the hoſtages left by the beſieged for the ſecurity of the eſcort, carriages, and other things allowed to them, are releaſed.

When the garriſon are made priſoners of war, they are in like manner eſcorted to the place agreed on.

Every thing ſtipulated or agreed upon in a capitulation ſhould be held ſacred and inviolable, and ought to be religiouſly obſerved. For when the king grants and ſigns a capitulation by his general, he acts in the ſame capacity as when he enters into and concludes a treaty of peace by his ambaſſador; in either caſe he acts as the procurator or agent of the community at large, as the conſtitutional repreſentative of parliament and the nation, and every ſuch act of his is equally binding on both. It is evident that parliament thought ſo when it paſſed the act that eſtabliſhed the church of Rome at Quebec and in Canada, and was convinced that it could not conſtitutionally violate the ſtipulations made in favour of that religion in the capitulation entered into by general Amherſt and the marquis de Vandreuil.

When the ſurrendering place or city has a citadel, it ſhould be ſtipulated that the garriſon ſhall have a certain time allowed them for retiring into the citadel with what they want; that the ſick and wounded, who are not in a ſituation to be removed, ſhall remain in their lodgings in the place till they are cured or get well, when they are to be furniſhed with carriages and paſſports to retire to ſome place agreed on; that none are to be admitted into the citadel that cannot be uſeful in aſſiſting to defend it; and that the beſiegers ſhall not erect any work or works whatſoever for the purpoſe of carrying on approaches againſt the ſame during the time preſcribed.

If the operations, either of the beſieged or beſiegers, be carried on in conjunction with confederates or allies, ſtipulations ought to be made on and in their behalf; and if they be principals as well as the beſiegers, they ſhould be parties to the capitulation.

If the place be a maritime town, with a harbour or harbours, and ſhipping in them, belonging either to the beſieged or to their allies, or other nations, terms or conditions reſpecting theſe ſhould be expreſsly inſerted in the body of the treaty or convention.

If the beſieged be in a place that is ſituate in a country diſtant from their own, to which they cannot return but by water, and have no other ſtrong hold in that country for them to retire to, they ſhould take care to have it ſtipulated in the capitulation that the beſiegers ſhall furniſh them with tranſports, proviſions, and a ſufficient convoy, and carry them to the neareſt port or ports in their own country.

As the capitulation agreed to and ſigned by lord Keith, lord Hutchinſon, Huſſem capitan pacha, and general Menou, at Alexandria the 30th Auguſt 1801, compriſes as great a diverſity of the foregoing ſpecified conditions or ſtipulations as any other that we know of, we will conclude this article by inſerting it as a very good ſpecimen, form, or model.

# CAPITULATION.

*Articles of the Capitulation propoſed by Abdoullah Jacques Francois Menou, General in Chief of the French Army now in Alexandria, to the Generals commanding the Land and Sea Forces of His Britannic Majeſty, and of the Sublime Porte, forming the Blockade of Alexandria, dated the 12th Fructidor, Year Nine of the French Republic, (30th of Auguſt,* 1801.)

Art. 1. From the preſent date to the 30th Fructidor (17th of September, 1801), there ſhall be a continuation of the truce and ſuſpenſion of arms between the French army, and the combined armies of his Britannic majeſty and of the Sublime Porte, upon the ſame conditions with thoſe which actually ſubſiſt, with the exception of a regulation to be amicably ſettled between the reſpective generals of the two armies, for eſtabliſhing a new line of advanced poſts, in order to remove all pretext of hoſtility between the troops.

Anſwer. Refuſed.

Art. 2. In caſe no adequate ſuccour ſhould arrive to the French army before the day mentioned in the preceding article, that army ſhall evacuate the forts and entrenched camps of Alexandria upon the following conditions.

Anſwer. Refuſed.

Art. 3. The French army ſhall retire, on the firſt complementary day of the French æra, into the city of Alexandria, and forts adjacent, and ſhall deliver up to the allied powers the entrenched camp in front of the lines of the Arabs, the Fort le Turc, and the Fort du Vivier, together with their artillery and ammunition.

Anſwer. In forty-eight hours after the ſigning of the capitulation, namely, on the 2d of September, at noon, the entrenched camp, the Fort Turc, and that of du Vivier, ſhall be delivered up to the allied powers. The ammunition and artillery of theſe forts ſhall be alſo delivered up. The French troops ſhall evacuate the city, forts, and dependencies of Alexandria ten days after ſigning the capitulation, or at the time of their embarkation.

Art. 4. All individuals, conſtituting a part of the French army, or attached to it by any relations, civil or military, the auxiliary troops of every nation, country, or religion, of whatever powers they might have been ſubjects before the arrival of the French, ſhall preſerve their property of every deſcription, their effects, papers, &c. &c. which ſhall not be ſubject to any examination.

Anſwer. Granted; provided that nothing be carried away belonging to the government of the French republic; but only the effects, baggage, and other articles belonging to the French and auxiliary ſoldiers who have ſerved during ſix months in the army of the republic; the ſame is to be underſtood of all the individuals attached to the French army, by civil or military capacities, of whatever nation, country, or religion they may be.

Art. 5. The French forces, the auxiliary troops, and all the individuals deſcribed in the preceding article, ſhall be embarked in the ports of Alexandria, between the 5th and the 10th of Vendemaire, year ten of the republic, at the lateſt (27th of September to the 3d of October, 1801), together with their arms, ſtores, baggage, effects, and property of all kinds, official papers, and depoſits, one field piece to each battalion and ſquadron, with ammunition, &c. &c. &c. the whole to be conveyed to one of the ports of the French republic in the Mediterranean, to be determined by the general in chief of the French army.

Anſwer. The French forces, the auxiliary troops, and all the individuals deſcribed in the 4th article, ſhall be embarked in the ports of Alexandria (unleſs after an amicable convention it ſhould be found more expeditious to embark a part of them at Aboukir), as ſoon as veſſels can be prepared, the allied powers at the ſame time engaging that the embarkation ſhall take place, if poſſible, ten days after the capitulation ſhall be ſigned; they ſhall receive all the honours of war, ſhall carry away their arms and baggage, ſhall not be priſoners of war, and ſhall moreover take with them ten pieces of cannon, from four to eight pounders, with ten rounds of ſhot to each gun; they ſhall be conveyed to a French port in the Mediterranean

Art. 6. The French ſhips of war, with their full complement, and all merchant ſhips, to whatever nation or individuals they may belong, even thoſe of nations at war with the allied powers, or thoſe that are the property of owners or merchants, who were ſubjects of the allied powers before the arrival of the French, ſhall depart with the French army, in order that thoſe that are ſhips of war may be reſtored to the French government, and the merchant ſhips to their owners, or to their aſſignees.

Anſwer. Refuſed. All veſſels ſhall be delivered up as they are.

Art. 7. Every ſingle ſhip that, from the preſent day to the 30th Fructidor, ſhall arrive from the French republic, or any of her allies, into the ports or roads of Alexandria, ſhall be comprehended in this capitulation. Every ſhip of war or commerce, belonging to France, or to the allies of the Republic, that ſhall arrive in the port or road of Alexandria within the twenty days immediately following the evacuation of that place, ſhall not be conſidered as lawful prize, but ſhall be ſet at liberty, with her equipage and cargo, and be furniſhed with a paſſport from the allied powers.

Anſwer. Refuſed.

Art. 8. The French and auxiliary troops, the civil and military agents, attached to the army, and all other individuals deſcribed in the preceding articles, ſhall be embarked on board ſome French or other veſſels, actually in the ports of Alexandria, as ſhall be in a condition to go to ſea, or on board thoſe of his Britannic majeſty, and of the Sublime Porte, within the time fixed by the 5th article.

Art. 9. Commiſſioners ſhall be named by each party to regulate the number of veſſels to be employed, the number of men to be embarked upon them, and generally to provide for all the difficulties that may ariſe in carrying into execution the preſent capitulation. Thoſe commiſſioners ſhall agree upon the different poſitions which ſhall be taken by the ſhips now in the port of Alexandria, and thoſe which ſhall be furniſhed by the allied powers, ſo that by a well-regulated arrangement, every occaſion of difference between the crews of the ſeveral nations may be avoided.

Anſwer. All theſe details will be regulated by the Engliſh admiral, and by an officer of the French navy, named by the general in chief.

Art. 10. Merchants and owners of ſhips, of whatever nation or religion they may be, and alſo the inhabitants of Egypt, and of every other country, who may at the preſent time be in Alexandria, whether Syrians, Cophts, Greeks, Arabs, Jews, &c. and who ſhall be deſirous of following the French army, ſhall be embarked with, and enjoy the ſame advantage with that army; they ſhall be at liberty to remove their property of all kinds, and to leave power for the diſpoſal of what they may not be able to take away. All arrangements, all ſales, all ſtipulations, whether of commerce or of any other nature made by them, ſhall be ſtrictly carried into effect after their departure, and be maintained by the generals of his Britannic majeſty, and of the Sublime Porte. Thoſe who may prefer remaining in Egypt a certain time, on account of their private affairs, ſhall be at liberty ſo to do, and ſhall have full protection from the allied powers; thoſe alſo who may be deſirous of eſtabliſhing themſelves in Egypt, ſhall be entitled to all the privileges and rights of which they were in poſſeſſion before the arrival of the French.

Anſwer. Every article of merchandize, whether in the town of Alexandria, or on board the veſſels that are in the ports, ſhall be proviſionally at the diſpoſition of the allied powers; but ſubject to ſuch definitive regulation as may be determined by eſtabliſhed uſage, and the law of nations. Private merchants ſhall be at liberty to follow the French army, or they may remain in the country in ſecurity.

Art. 11. None of the inhabitants of Egypt, or of any other nation or religion, ſhall be called to account for their conduct during the period of the French troops having been in the country, particularly for having taken arms in their favour, or having been employed by them.

Anſwer. Granted.

Art. 12. The troops, and all others who may be embarked with them, ſhall be fed during their paſſage, and until their arrival in France, at the expence of the allied powers, and conformably to the rules of the French navy. The allied powers ſhall ſupply every thing that may be neceſſary for the embarkation.

Anſwer. The troops, and all others who may be embarked with them, ſhall be fed during their paſſage, and until their arrival in France, at the expence of the allied powers, according to the uſage eſtabliſhed in the marine of England.

Art. 13. The conſuls and all other public agents, of the ſeveral powers in alliance with the French republic, ſhall continue in the enjoyment of all the privileges and rights which are granted by civilized nations to diplomatic agents. Their property, all their effects and papers, ſhall be reſpected, and placed under the protection of the allied powers: they ſhall be at liberty to retire or to remain, as they may think fit.

Anſwer. The conſuls and all other public agents of the powers in alliance with the French republic, ſhall be at liberty to remain or to retire, as they may judge fit. Their property and effects of any kind, together with their papers, ſhall be preſerved for them, provided they conduct themſelves with loyalty, and conformably to the law of nations.

Art. 14. The ſick who may be judged by the medical ſtaff of the army to be in a ſtate for removal, ſhall be embarked at the ſame time with the army, upon hoſpital ſhips properly furniſhed with medicines, proviſions, and every other ſtore that may be neceſſary for their ſituation; and they ſhall be attended with French ſurgeons. Thoſe of the ſick who may not be in a condition to undertake the voyage, ſhall be delivered over to the care and humanity of the allied powers. French phyſicians and other medical aſſiſtance ſhall be left for their care, to be maintained at the expence of the allied powers, who ſhall ſend them to France as ſoon as their ſtate of health will permit, together with any thing belonging to them, in the ſame manner as has been propoſed for the reſt of the army.

Anſwer. Granted. The ſhips deſtined for hoſpitals ſhall be prepared for the reception of thoſe who may fall ſick during the paſſage. The medical ſtaff of the two armies ſhall concert together in what manner to diſpoſe of thoſe of the ſick, who, having contagious diſorders, ought not to have communication with the others.

Art. 15. Horſe tranſports for conveying ſixty horſes, with every thing neceſſary for their ſubſiſtence during the paſſage, ſhall be furniſhed.

Anſwer. Granted.

Art. 16. The individuals compoſing the Inſtitute of Egypt, and the commiſſion of arts, ſhall carry with them all the papers, plans, memoirs, collections of natural hiſtory, and all the monuments of art and antiquity, collected by them in Egypt.

Anſwer. The members of the Inſtitute may carry with them all the inſtruments of arts and ſcience, which they have brought from France; but the Arabian manuſcripts, the ſtatues, and other collections which have been made for the French republic, ſhall be conſidered as public property, and ſubject to the diſpoſal of the generals of the combined army.

General Hope having declared, in conſequence of ſome obſervations of the commander in chief of the French army, that he could make no alteration in this article, it has been agreed that a reference thereupon ſhould be made to the commander in chief of the combined army.

Art. 17. The veſſels which ſhall be employed in conveying the French and auxiliary army, as well as the different perſons who ſhall accompany it, ſhall be eſcorted by ſhips of war belonging to the allied powers, who formally engage that they ſhall not in any manner, be moleſted during their voyage; the ſafety of ſuch of theſe veſſels as may be ſeparated by ſtreſs of weather, or other accidents, ſhall be guaranteed by the generals of the allied powers; the veſſels conveying the French army ſhall not, under any pretence, touch at any other than the French coaſt, except in caſe of abſolute neceſſity.

Anſwer. Granted. The commander in chief of the French army entering into a reciprocal engagement that none of theſe veſſels ſhall be moleſted during their ſtay in France, or on their return; he equally engaging that they ſhall be furniſhed with every thing which may be neceſſary, according to the conſtant practice of European powers.

Art. 18. At the time of giving up the camps and forts according to the terms of the third article, the priſoners in Egypt ſhall be reſpectively given up on both ſides.

Anſwer. Granted.

Art. 19. Commiſſioners ſhall be named to receive the artillery of the place and of the forts, ſtores, magazines, plans, and other articles that the French leave to the allied powers; and liſts and inventories ſhall be made out, ſigned by the commiſſaries of the different powers, according as the forts and magazines ſhall be given up to the allied powers.

Anſwer. Granted. Provided that all the plans of the city and forts of Alexandria, as well as all maps of the country, ſhall be delivered up to the Engliſh commiſſary. The batteries, ciſterns, and other public buildings, ſhall alſo be given up in the condition in which they actually are.

Art. 20. A paſſport ſhall be granted to a French armed veſſel, in order to convey to Toulon, immediately after the camps and forts before-mentioned ſhall be given up, officers charged by the commander in chief to carry to his government the preſent capitulation.

Anſwer. Granted. But if it is a French veſſel it ſhall not be armed.

Art. 21. On giving up the camps and forts mentioned in the preceding articles, hoſtages ſhall be given on both ſides, in order to guarantee the execution of the preſent treaty. They ſhall be choſen from among the officers of rank in the reſpective armies: namely, four from the French army, two from the Britiſh troops, and two from the troops of the Sublime Porte. The four French hoſtages ſhall be embarked on board the Engliſh ſhip, commanding the ſquadron; and the four Britiſh and Turkiſh hoſtages on board one of the veſſels which ſhall carry the commander in chief, or the lieutenant generals. They ſhall all be reciprocally delivered up on their arrival in France.

Anſwer. There ſhall be placed in the hands of the commander in chief of the French army, four officers of rank as hoſtages: namely, one officer of the navy, one officer of the Britiſh army, and two officers of the Turkiſh army. The commander in chief ſhall, in like manner, place in the hands of the commander in chief of the Britiſh army four officers of rank. The hoſtages ſhall be reſtored on both ſides at the period of the embarkation.

Art. 22. If any difficulties ſhould ariſe during the execution of the preſent capitulation, they ſhall be amicably ſettled by the commiſſaries of the armies.

Anſwer. Granted.

(Signed) Keith, Admiral.
J. Hely Hutchinson, Lieutenant General, Commander in Chief.
Hussim, Capitan Pacha.
Abdoullah Jacques Francois Menou, General in Chief of the French Army.
James Kempt, Lieutenant Colonel and Secretary.

Capitulation denotes alſo a kind of treaty, *pacta conventa*, or original contract, drawn up by the electors, in the name of the princes and ſtates of the empire, before the election of an emperor; which the emperor is to ratify before his coronation; and to obſerve inviolable in the courſe of his reign.

The imperial capitulations have only been obtained ſince the time of Charles V. before which time the ordinary conſtitutions of the empire ſerved in lieu of theſe capitulations. They were occaſioned by the jealouſy the German princes had entertained of the too great power of the emperor. Frederic, duke of Saxony, ſurnamed the Wiſe, paſſes for the author of the imperial capitulation; who, declining the empire, which was offered him after the death of Maximilian, adviſed the electors to chooſe Charles V. under ſuch conditions as might ſecure the liberty of the empire. The deſign of the capitulation is, on the one hand, to prevent the emperor from abuſing his power to the oppreſſion of the people; and, on the other, to prevent the people from breaking in on the juſt rights of the emperor. And the principal points which the emperor undertakes to obſerve are the defence of the church and empire, an obſervance of the fundamental laws of the empire, and a maintenance and preſervation of the rights, privileges, and immunities of the electors, princes, and other ſtates of the empire, ſpecified in the capitulation. The imperial capitulations are conſidered as fundamental laws of the empire; and though the drawing up, preſenting, procuring the ſignature, and taking care of the execution of them, be committed to the electors, they are reputed the act of the ſtates of the empire.

The king of the Romans alſo, when elected, ſigns the emperor's capitulation, as being in right of ſuch election to ſucceed to the empire after the death of the emperor.

CAPITULUM, in *Anatomy*, a little head, eſpecially of a bone, anſwering to the Greek *condylus*.

Capitulum, in *Botany*, the head, or compound flower of any plant; being compoſed of many leaves and threads or ſtamina, cloſely connected in a globoſe, circular or diſcous figure; as the flowers of bluebottles, ſcabious, carduus, &c.

Capitulum, in *Ancient Geography*, a town of Italy, ſituated in the mountains above Preneſte, in the country of the Hernici, according to Strabo. Pliny calls it "Capitulum Hernicum," and Frontinus "Capitolum," and ſays that it received a colony conformably to the law of Sylla.

Capitulum, in the *Ancient Military Art*, was a tranſverſe beam, wherein were holes through which paſſed the ſtrings whereby the arms of huge engines, as baliſtæ, catapultæ, and ſcorpions, were played or worked. Vitruv. de Arch. lib. i. cap. i.

Capitulum, in *Eccleſiaſtical Writers*, denoted part of a chapter of the Bible read and explained.

In which ſenſe they ſaid, *ire ad capitulum*, *to go to ſuch a lecture*. Afterwards the place or apartment where ſuch theological exerciſes were performed, was denominated *domus capituli*.

CAPITURIA, in *Ancient Geography*, a town of Thrace, ſituate in the country of mount Rhodope. Procopius.

CAPIVACCIO, Jerom, in *Medical Biography*, a native of Padua, where he arrived at the higheſt honours of his profeſſion. In what year he was born is not known, but probably about 1525. In 1552, having paſſed through the uſual degrees, he was made profeſſor in medicine, an office he continued to hold with credit upwards of 30 years, his lectures being always numerouſly attended. He was alſo in great requeſt as a practitioner, and particularly famed for his ſkill in curing the lues venerea, by which he is ſaid to have amaſſed a very large property. This accounts for his refuſing to remove to Piſa, though invited thither by the offer of a large ſalary by the grand duke of Tuſcany. He wrote on every branch of medicine; and, as moſt of his works paſſed through ſeveral editions, we may ſuppoſe not unſkilfully, though they are now generally ſuperſeded by newer opinions. He died in 1589. The titles of the principal of his works are, "De Lue Venerea Acroaſes," Spiræ, 1590. Francf. 1594, 8vo. He uſually began the cure with giving the decoction of guiacum and ſarſaparill; thoſe not ſucceeding, he had recourſe to mercurial inunction. "Methodus Practicæ Medicinæ, omnium Corporis Humani Adfectuum Cauſas, Signa, et Curationes exhibens," Ven. 1591, fol. "Methodus Anatomica, ſive Ars Conſecandi," edited by Teucer, with a diſſertation in praiſe of anatomy. A compendium, containing deſcriptions of all the parts of the body, taken from Galen. Venet. 1593. Alſo, "De Fœtus Formatione, De Signis Virginitatis, de Urinis," &c. Theſe, with ſeveral other ſmaller pieces, were collected and publiſhed together under the title of "Opera Omnia," fol. Venet. 1597, reprinted 1601-3, 6, and 17. Aſtruc De Morb. Ven. Douglas Bib. and Haller Bib. Med. Anat. et Chirurg.

A malignant and fatal fever raging at Venice in 1576, Capivaccio was ſent for to give his aſſiſtance in repreſſing it. But his endeavours not proving ſucceſsful, and having unfortunately on his arrival declared the fever not to be contagious, he was ſent away in diſgrace. More than 100,000 of the inhabitants are ſaid to have been ſwept off by the fever.

CAPIVARD, in *Zoology*. See Capybara.

CAPIVI. See Balsam.

CAPNELÆON, from καπνος, *ſmoke*, and ελαιον, *oil*, among *Ancient Naturaliſts*, denotes a ſpecies of reſin, which flows ſpontaneouſly, being warmer, thinner, and more fluid than all other ſorts of reſins, ſo as nearly to approach the nature of oil, and evaporating plentifully on being expoſed to the fire; whence the denomination, which imports as much as ſmoaking oil. It is ſometimes alſo called *piſſanthos*, or flower of pitch.

CAPNIA, in *Botany*, (from καπνια, *ſoot*,) a genus formed by Ventenat for the umbilicated lichens of Linnæus.

CAPNICON, in *Antiquity*, chimney-money, or a tax which the Roman emperors levied for ſmoke, and which of conſequence was due from all, even the pooreſt, who kept a fire. This was firſt invented by Nicephorus.

CAPNIO, in *Biography*. See Reuchlin.

CAPNISTON, among *Ancient Phyſicians*, denotes oil whoſe fumes, rendered aromatic by burning ſpices, are conveyed to a part affected.

CAPNITIS, or Capnitas *Jaſpis*, in the *Natural Hiſtory of the Ancients*, the name of a ſpecies of chalcedony, of a browniſh ground, clouded with a large miſt of blackiſh, looking like a column of ſmoke. The ancients alſo called our common chalcedony a jaſper, not allotting any peculiar generical name to theſe miſty ſtones; and the name they gave this ſpecies very happily expreſſed its character, becauſe it looks exactly as if obſcured by a cloud of thick ſmoke. It is very common in the Eaſt Indies, and is ſometimes found in Germany and France, but is ſeldom worked into any thing better than knife-hafts. See Chalcedony.

CAPNOIDES, in *Botany*. (Tourn. and Gærtner.) See Fumaria, Capnoides, and Lutea.

CAPNOMANCY, a kind of divination by means of ſmoke, uſed by the ancients in their ſacrifices. The word comes from καπνος, *ſmoke*, and μαντεια, *divination*. The general rule was, when the ſmoke was thin and light, and roſe ſtraight up, it was a good omen; if the contrary, it was an ill one.

There was alſo another ſpecies of capnomancy, conſiſting in the obſervation of the ſmoke riſing from poppy and jeſſamin-ſeeds caſt upon light coals.

CAPNOPHYLLUM, in *Botany*, a genus formed by Gærtner for the *Conium Africanum* of Linnæus, with the following character. *Umbel* compound, conſiſting of few rays; lateral rays of the partial umbel barren; central one very ſhort, fertile. *Involucres* very ſhort, each conſiſting of about three leaves. *Corolla* irregular. *Fruit* nearly ſeſſile; ridges muricated with tubercles. See Conium *Africanum*.

CAPNOS, (Lobel). See Fumaria *officinalis*, and *ſpicata*.

CAPO, in *Ichthyology*, a name given by Paulus Jovius and ſome others to the fiſh called *coccyx* by the ancient Greeks, and *cuculus* by the Latin writers. It is preſumed to be a ſpecies of *trigla*, moſt likely the modern *trigla gurnardus*; or, perhaps, applied indiſcriminately to that ſpecies, and *trigla lyra*.

Capo, *Ital.* the head, or beginning of any production. In vocal muſic, particularly in opera ſongs of two ſtrains, *da capo*, at the end of the ſecond ſtrain, is an injunction to return to the beginning of the air or movement, or to any part of it where this character of reference 𝄋, can be diſcovered, and purſue its courſe as far as this ſign 𝄐, which is placed over the finale note. See Segno and Corona.

Capo-Bianco, in *Geography*, a canton of the department of Golo, or iſle of Corſica, containing 4147 inhabitants.

Capo *d'Iſtria*, a ſea-port town of Iſtria, belonging to the ſtate of Venice, the ſee of a biſhop, ſuffragan of Udina, ſituate in the gulf of Trieſte, in an unhealthy diſtrict, near ſalt marſhes; 7 miles S. of Trieſte. N. lat. 45° 48'. E. long. 14°.

CAPOC, in *Commerce*, a ſort of cotton, ſo fine and ſo ſhort, that it cannot be ſpun. It is uſed in the Eaſt Indies to line palanquins, to make beds, mattreſſes, cuſhions, pillows, &c.

CAPOETA, in *Ichthyology*, a ſpecies of Cyprinus, inhabiting the Caſpian Sea, and in winter migrating up the rivers. The anal fin has nine rays, the third ray of the dorſal and anal being the longeſt, and ſerrated downwards; and it has two cirrhi. Gmelin.

COPOLETTO, a town and port of Aſia, in Georgia, ſeated on the Black Sea.

CAPOLINIERI, a ſmall town of the iſland of Elba, near the coaſt of Tuſcany.

CAPOLITA, in *Geography*, a river of North America, in the province of Guaxaca, which runs into the Pacific Ocean, 18 miles N. E. of Tangolotargo.

CAPOLLIN, in *Botany*, *Mexicanorum Hernandez*, *ſeu Cerafus dulcis Indica*. It is a tree of moderate bigneſs, with leaves like thoſe of an almond, or our country cherry tree. The flowers hang down in bunches, which are ſucceeded by fruit reſembling our cherries. It bloſſoms in the ſpring, and bears fruit all the ſummer; it requires a temperate climate, and grows in gardens and fields in Mexico, as well ſpontaneouſly as by cultivation.

The juice of the young buds mollifies the tongue when parched by heat. A decoction of the bark being expoſed to the ſun for fifteen days, and the weight of a dram of it taken, cures the dyſentery. The powder helps inflammations. In times of dearth, they make bread and drink of the fruit; but it affords an aliment inclining to melancholy, giving a rankneſs to the breath, and making the teeth black. There are three ſpecies of this tree, which differ only in fruit; but all of them hang in cluſters.

CAPON, in *Rural Economy*, a cock chicken, which has been caſtrated as ſoon as left by the hen, or as ſoon as he begins to crow. Capons are uſeful to lead chickens, ducklings, young turkeys, pheaſants, or partridges, as they do it better than hens, and at the ſame time defend them better from birds of prey, and, from the largeneſs of their bodies, they can cover a greater number of them, and much more completely. See Poultry.

Capon's *Tail-graſs*. See Festuca.

CAPONIER, in French Caponiere, or Caponniere, a ſort of double covert-way, with a parapet on each ſide, ſloping, and terminating in the form of a glacis. All communications of this ſort and form, between either the body of the place and the outworks, or between the ſaliant angles of the covert-way, and either arrows or other works at the ſaliant angles of the glacis, or between the ſaliant angles of the covert-way, and detatched redoubts, or works advanced to ſome diſtance beyond the glacis, for the purpoſe of occupying particular ſpots of ground, to prevent an enemy's getting poſſeſſion of them, may with propriety be, and ſometimes are, called *caponiers*.

When the communication is directly oppoſite to the middle of the curtain, and extends from the tenailles acroſs a dry ditch to the re-entering angle of the counter-ſcarp, or of the ravelin, it is from twelve to fifteen feet wide, has a banquette on each ſide, as alſo a parapet, which terminates in the ditch in a gentle ſlope, in the form of a glacis, at the diſtance of ten or twelve fathoms from its interior ſide. The inſide of it is excavated from two to four feet below the level of the ditch, and the parapet is raiſed from three to five feet above the ſame level. It ſerves as a ſafe paſſage for the troops from the body of the place to the counter-ſcarp and outworks. Such caponiers are frequently made in dry ditches, even when there are no tenailles oppoſite to the curtains.

The principal uſe of ſuch caponiers is to defend, directly, the paſſage of the ditch oppoſite to the faces of the baſtions, and to afford the ſoldiers a ſecure communication between the body of the place and the outworks. To prevent their being ſeen, as they are quitting or leaving them, the re-entering angles of the counter-ſcarp are often partly cut off by right lines parallel to the curtains and excavations, or lodgments are made in thoſe places, ſometimes in one form and ſometimes in another.

When ſuch a communication is made between a ſaliant angle of the covert-way and a work on one at the foot of the glacis, it is commonly from twenty four to thirty feet wide, and has a traverſe at its entrance, about eighteen feet thick, with a paſſage ſix or eight feet wide round it.

When ſuch a communication is made from a ſaliant angle of the covert-way to a detached redoubt, or other work, advanced beyond the foot of the glacis, it is uſually from thirty to thirty-ſix feet wide; and when it is of any conſiderable length, has commonly two traverſes, one at its entrance, and the other in the middle, or about half way between the work and the foot of the glacis.

It was the cuſtom formerly to cover the caponier with thick planks, and a quantity of earth upon them, and to open ſmall embrazures or loop-holes in each parapet, for firing through on the enemy. But the ſmoke of the powder occaſioned great annoyance and inconvenience to the men in it. It is, therefore, cuſtomary now to cover them, during a ſiege, only with hurdles or blinds, ſufficiently to ſecure the men employed in defending them againſt ſtones, which the enemy may throw into the ditch to make them abandon it. The ſame nuiſance and inconvenience from ſmoke would be found to ariſe from the making uſe of fire-arms in ſuch caſemated galleries, with loop-holes in the counter-ſcarp, as thoſe in ſome of the works at Portſmouth. Other arms or offenſive weapons than fire-arms might, undoubtedly, be made uſe of in them, with much leſs inconvenience than muſkets, and at the ſame time with greater effect and certainty, at ſo ſhort a diſtance as the width of the ditch. See Fortification, *fig.* 18.

CAPORALE, in *Biography*, an Italian performer on the violoncello, who came into England about the year 1734, and was much admired for the full and ſweet tone which he drew from his inſtrument; which was his principal merit: for he was no deep muſician, nor had he a powerful hand; yet he was always heard with great partiality by the public, and Handel frequently compoſed ſongs expreſsly to diſplay his intelligible talent of tone.

CAPORALI, Cæsar, an Italian poet, was born at Perugia, in 1530, and having been ſucceſſively employed in the ſervice of ſeveral cardinals, died in 1601, at the ſeat of his patron Aſcanio, marquis of Cargno. As a poet in the bernieſque, or burleſque ſtyle, he excelled moſt of thoſe who wrote in the ſame ſtyle, particularly in decency of ſubject and imagery. His moſt popular piece was a ſatire on courts and courtiers, expoſing to ridicule and contempt thoſe who ſink into ſervility and wretchedneſs by aſpiring to fortunes in an attendance on the great. He wrote alſo ſome poems of the romantic claſs, as his "Life of Mecænas," left unfiniſhed, and two comedies, viz. "Lo Seiocco," and "La Ninnetta;" publiſhed at Venice in 1605. A collection of his poems, with the obſervations of his ſon, Charles, was publiſhed at Venice, in 1656 and 1662. Tiraboſchi. Moreri. Gen. Biog.

CAPORNACK, in *Geography*, a town and caſtle of Hungary, in Sclavonia.

CAPOT, at *Picquet*, is when one of the gameſters wins all the cards, in which caſe he gains forty points.

CAPO-TASTO, in *Muſic*, in high ſhifts on the violoncello, is ſhortening the ſtrings, by making the thumb of the left hand ſerve as a nut on the finger-board; by which means the four fingers can play as many paſſages without altering the poſition of the hand, as in its natural poſition, without ſhifting.

CAPOTENA, or Capotana, in *Ancient Geography*, a town of Aſia, placed by Ptolemy in Aſia.

CAPOTES, a mountain in Aſia, in which, according to Pliny, was one of the ſources of the Euphrates.

CA-POUDIA, the *Caput Vada* of Procopius, the *Ammonis Promontorium* of Strabo, and the *Promontorium Brachodes* of Ptolemy, a long narrow ſlip of land, ſtretching itſelf a great way into the ſea, on the weſtern coaſt of the ancient Bizacium, or Tunis. Upon the point of this promontory are the ruins of the city that was built there by Juſtinian; where is likewiſe a high round watch-tower. Two more of the like kind occur between this place and Sfax; which are neceſſary guides to mariners in approaching this low and dangerous coaſt. To the S.E. of Ca-poudia are the two flat and contiguous iſlands of the "Querkinoſs," the ancient "Circina," and "Circemitis," at the diſtance of five leagues. At theſe iſlands Strabo and other ancient geographers fix the beginning of the Leſſer Syrtis; though Dr. Shaw is of opinion, that it ſhould rather commence at Ca-poudia. N. lat. 35° 2′. E. long. 11° 30′.

CAPOUL, or Capul, one of the ſmaller Philippine iſlands, lying a little ſouth of Luçon. It is three leagues in compaſs; the ſoil is fertile, agreeable, and commodious for the Indians, who live after the manner of the Biſayas.

CAPOZWAR, a ſmall but ſtrong town of Hungary, ſeated on the river Capoz.

CAPPA, in *Ichthyology*, a ſpecies of Sciæna, having double ſcales on the ſides of the head. Found in the Mediterranean.

CAPPADINE, in *Commerce*, a ſort of ſilk flock, taken from the upper part of the ſilk-worm cod, after the true ſilk has been wound off. It is alſo called *laſſis* and *carbaſs*, becauſe ſlight ſtuffs under thoſe names are made of it.

CAPPADOCIA, in *Ancient Geography* and *Hiſtory*, was known to the ancients by the name of Syria or Aſſyria, and borrowed the name of Cappadocia, according to Pliny (l. vi. c. 3.) from the river Cappadox, or according to Herodian (apud Stephan.) from Cappadocus, the founder of this kingdom. In ancient times, this kingdom comprehended the whole of that country, which lies between mount Taurus and the Euxine ſea; and was divided by the Perſians into two ſatrapies, or governments; and by the Macedonians, under the ſucceſſors of Alexander, into two kingdoms; the one called "Cappadocia ad Taurum," and "Cappadocia Magna," the other "Cappadocia ad Pontum," and commonly "Pontus," which ſee.

*Cappadocia Magna*, or "Cappadocia" properly ſo called, lay between the 38th and 41ſt degrees of north latitude; bounded on the north by Pontus, from which it was ſeparated by a long chain of mountains, bearing towards the weſt the appellations of Lithrus and Ophlinus, and towards the eaſt that of Paryadræ; on the ſouth, by Lycaonia, and part of Armenia Minor; or, according to M. d'Anville, by mount Taurus, which ſeparated it from Comagena and Cilicia; on the weſt, by Galatia and Phrygia; and on the eaſt, by the Euphrates, and part of Armenia Minor, or, if it be made to compriſe this latter province, it is almoſt wholly bounded by the Euphrates, which ſeparated it from Sophena. In the time of Archelaus, Cappadocia was divided into ten prefectures, five of which lay near mount Taurus, viz. Melitena, Cataonia, Cilicia, Tyanitis, and Iſſauritis; and the other five comprehended the remaining part of the kingdom, of the ſituation and principal towns of which Strabo has given no information. According to Ptolemy Cappadocia, to which he alſo annexes Pontus, was bounded on the weſt by Galatia; on the ſouth by Cilicia, and part of Syria towards the Amanus; on the eaſt by Armenia Major and the Euphrates; and on the north by that part of the Euxine ſea, which extended from Amiſus in Galatia to the branch of the Amanus that bounded the country on the eaſt. The emperor Valens divided Cappadocia into two provinces, viz. Cappadocia Prima" and "Cappadocia Secunda," of which latter Tyana was the metropolis. The metropolis of Cappadocia, in ancient times, was Mazaca or Euſebia, called afterwards *Cæſarea*, which ſee. Its other cities of note were Comana, Nyſſa, Nazianzum, Archelais, Diocæſarea, Fauſtinopolis, Cabiſtra, and Pterium, which ſee reſpectively. The principal rivers of this country were the Melas, the Halys, and the Sarus.

Whatever may have been the national character of the Cappadocians at an early period and under their firſt ſovereigns, they were in the time of the Romans reputed laſcivious, lewd, and addicted to all manner of vice; and they were deemed ſo infamous among other nations, that a wicked and impious man was emphatically called a "Cappadocian." The following very ancient Greek epigram, applied to the Cappadocians, is recorded by Conſtantine Porphyrogenitus:

> "Καππαδόκην ποτ' ἔχιδνα κακὴ δάκεν, ἀλλά και αὐτὴ,
> Κάτθανε γευσαμένη αἵματος ἰοβόλου."
>
> "Cappadocem aliquando vipera mala momordit, ſed et ipſa
> Mortua eſt guſtato ſanguine virulento."

It was a nation ſo ſervile, ſays Strabo (l. xii. p. 372.), that when the Romans offered them their freedom to live by their own laws, they ſaid they could not endure liberty. Cicero ſays of them, that they were "De Grege Venalium;" whence it is inferred, that this country furniſhed a great number of ſlaves; ſee alſo Perſius Sat. vi. ſub fin. Horat. Ep. vi. l. i. v. 39. This national character, however, underwent an important change after the introduction of Chriſtianity; for we find among the natives of Cappadocia Gregory Thaumaturgus, Baſil the Great, and Gregory of Nazianzum.

The religion of the ancient Cappadocians was much the ſame with that of the Perſians. At Comana they had a rich and ſtately temple, conſecrated to Bellona, whoſe prieſts and attendants of both ſexes amounted, in Strabo's time, to more than 6000. On ſtated days they had exhibitions of battles, in which the prieſts and their attendants cut and wounded each other in a tranſport of enthuſiaſtic fury. They had alſo ſeveral other magnificent temples of Apollo Cataonius, and of Jupiter, in the province of Morimena, which laſt had 3000 religious votaries. The chief prieſt, next in rank to that of Comana, had, as Strabo ſays (l. xii. p. 375.), a yearly revenue of 15 talents. Diana Perſica was worſhipped in the city of Caſtaballa, where women, devoted to the worſhip of this goddeſs, are ſaid to have trodden barefooted on burning coals, without injury. The commerce of the Cappadocians in mules and horſes, produced in their country, was very conſiderable. The horſes that were bred on the plains, which ſtretched from the foot of mount Argæus to the banks of the Sarus, were renowned above all others in the ancient world, for their majeſtic ſhape and incomparable ſwiftneſs. Cappadocia abounded alſo with mines of ſilver, iron, and alum, and afforded alabaſter, cryſtal, and jaſper, and probably ſupplied the neighbouring countries with theſe commodities.

It has been thought by thoſe who have made reſearches into the hiſtory of ancient nations, that Cappadocia was peopled by the deſcendants of Togarmah, the youngeſt ſon of Gomer. In the time of Crœſus ſome have ſuppoſed that Cappadocia formed a part of the kingdom of Lydia; and after the defeat of this prince, it became ſubject to the Perſians, to whom the Cappadocians paid an annual tribute, as Strabo ſays (l. xii. p. 370.), of 1500 horſes, 2000 mules, and 50,000 ſheep. The moſt ancient king of Cappadocia, recorded in hiſtory, is Pharnaces, a noble Perſian, who, having ſaved Cyrus from a ravenous lion, that purſued him while he was hunting, was rewarded with his ſiſter Atoſſa, and the kingdom of Cappadocia. This country was afterwards ſubdued by the Macedonians, and changed into a province; but it was reſtored to its former ſtate by Ariarathes III., who, having eſcaped the general ſlaughter of the royal family by Perdiccas in the time of his father Ariarathes II., fled into Armenia; and availing himſelf of the civil diſſenſions that took place among the Macedonians, recovered his paternal kingdom, and tranſmitted it to his poſterity. After a ſucceſſion of 10 princes, Archelaus, though not related either to the family of Pharnaces or to that of Ariobarzanes, which had poſſeſſed the ſovereignity, was placed on the throne of Cappadocia by Mark Antony, to whom he continued faithful till after the battle of Actium. But having offended Tiberius by paying him no reſpect, during his retirement at Rhodes, he was enticed to Rome by letters from Livia, who, without diſſembling her ſon's reſentment, promiſed him his pardon, on condition of his coming to implore it in perſon. Archelaus obeyed the ſummons; but was received by the emperor with contempt and indignation, and ſoon after accuſed as a criminal in the ſenate. Although the crimes alleged againſt him were mere fictions, he was ſo chagrined at being treated like a malefactor, that he is ſaid by ſome to have ſoon died of grief, or, as others ſay (Tacit. Annal. lib. 1.), he laid violent hands on himſelf. Upon his death, the kingdom of Cappadocia was reduced to a Roman province, and governed by thoſe of the equeſtrian order. Germanicus, A. D. 18, regulated the affairs both of Cappadocia and Commagena, and appointed two of his friends to the government of theſe provinces. In the year 73, Veſpaſian ſent troops into Cappadocia and attached the government of that province to the rank of conſul, inſtead of the order of knights. In this ſtate Cappadocia continued till the erection of the new empire of Trebiſond, with which it fell into the hands of the Turks; by whom the whole province, with the addition of Pontus, is now called Amaſia, after the name of that city, where the beglerbeg of Anatolia reſides. See Amasia.

CAPPADOX, a river of Aſia, which has its ſource in mount Amanus, and diſcharges itſelf into the Euphrates S. E. of Samoſata.—Alſo, a river of Aſia which bounded the Cappadocians on the ſide of Galatia, and commencing to the eaſt of Saonda falls into the Halys at Aſpona. See Cappadocia.

CAPPAGUM, a town of Spain placed by Pliny in Bœtica.

CAPPANUS, in *Conchology*, the name by which ſome old writers diſtinguiſh the *ſea-worm*, or teſtaceous molluſca, called by recent authors *Teredo navalis*. This is alſo known by the name of ſhip-worm, being that particular ſpecies which bores into the bottoms of ſhips, and to obviate the pernicious effects of which they are now generally ſheeted with copper from the keel to a little above the water's edge.

CAPPAREA, in *Ancient Geography*, a town of Aſia, ſituate in a plain of Syria, S. E. of Apamea.

CAPPARIDES, or Capparideæ, in *Botany*, the fourth order of the thirteenth claſs of Juſſieu's natural orders, and the eighth order of the thirteenth claſs in the arrangement of Ventenat; with the following characters. *Calyx* either many-leafed, or one-leafed divided into ſegments. *Petals* four or five, often alternating with the diviſions of the calyx. *Stamens* ſeldom of a definite number. *Germ* ſimple, often ſtipitate or pedicelled; ſtipe or pedicel ſometimes ſtameniferous and glandular at its baſe; ſtyle none, or rarely one; ſtigma ſimple. *Fruit* many-ſeeded, either a ſilique or a berry, one-celled (rarely many-celled?). *Seeds* often kidney-ſhaped, either bedded in the pulp of the fruit, or affixed to lateral receptacles. *Periſperm* none, though the interior coat of the ſeed is ſometimes fleſhy and ſwollen ſo as to appear like a periſperm. *Embrio* ſemicircular; radicle curved upon the lobes which are almoſt cylindrical, and applied one to the other. See Ventenat Pl. 15. fig. 3. *Stem* almoſt always a ſhrub or tree, rarely herbaceous. *Leaves* alternate, ſimple, entire, rarely ternate or digitate, proceeding from naked, ſcaleleſs buds; ſometimes with two ſtipules, ſpines or glands at their baſe. Its genera, according to Juſſieu, are cleome, cadaba, capparis, ſodaba, crateva, moriſonia, and durio; the following are added as nearly allied, margraſia, norantea, reſeda, droſera, and parnaſſia. Ventenat deſcribes under this order only cleome, capparis, crateva, and moriſonia; reſeda and parnaſſia as nearly allied.

CAPPARIS, (καππαρις, Theophraſ. Dioſcorides; derivation uncertain. Some ſuppoſe it originally Arabic.) Linn. gen. 643. Schreb. 876. Willd. 1010. Juſſ. 243. Vent. 2. 120. Tourn. 139. Claſs and order, *polyandria monogynia.* Nat. Ord. *putamineæ*, Linn. *capparides*, Juſſ. Gen. Ch. *Cal.* Perianth four-leafed or four-cleft, leathery; leaves or ſegments egg-ſhaped, concave, gibbous, caducous. *Pet.* four, obtuſe, ſpreading, generally large. *Stam.* Filaments generally numerous, thread-ſhaped, ſpreading; anthers oblong, verſatile, inclined. *Piſt.* Germ pedicelled; ſtyle none; ſtigma obtuſe. *Peric.* Berry, capſule or ſilique, fleſhy, various in ſhape, one-celled, pedicelled. *Seeds* generally numerous, kidney-ſhaped.

Eſſ. Ch. *Calyx* four-leaved or four-cleft; leathery. *Petals* four, ſtamens long. *Pericarp* fleſhy, one-celled, pedicelled. Obſ. C. cantonienſis has a five-leaved calyx and five petals.

* *With ſpiny ſtipules.*

Sp. 1. C. *ſpinoſa*, caper-buſh, Linn. Sp. Pl. 1. Willd. 1. Lam. Encyc. 1. Martyn's Miller 1. Smith ſpicil. 2. 18. tab. 20. Lam. Ill. Pl. 446. Woodv. Med. Bot. Pl. 228. Curtis Bot. Mag. 291. "Peduncles one-flowered, ſolitary; leaves roundiſh, obtuſe, ſmooth; capſules oval," Willd. A low ſhrub, generally growing out of the joints of old walls, the fiſſures of rocks, and among rubbiſh. *Stems* trailing two or three feet long, round, ſmooth, branched; branches alternate, ſpreading, often downy. *Leaves* on ſhort petioles, alternate, in the wild plant often terminated by a little ſharp point which diſappears by culture, entire, a little fleſhy, veiny, ſmooth, bright green; ſpiny ſtipules two, ſharp, a little recurved, yellowiſh, in the cultivated plant nearly obliterated. *Flowers* large, beautiful, ſcentleſs; peduncles axillary, round, about the length of the leaves, firſt horizontal, finally pendulous,; calyx-leaves unequal, tipped with purple; petals white, with a faint tincture of red, larger than the calyx, ſpreading, inverſely egg-ſhaped, waved; the two upper ones a little cohering at their baſe; ſtamens very numerous, the length of the petals or longer; filaments pale purple; germ oval, ſmall, green; pedicel purpliſh, longer than the ſtamens. *Fruit*, according to Linnæus, a berry; Dr. Smith, a capſule; La Marck, a ſilique; but it is evident from his figure that he has given it an improper denomination. Suppoſed to have been originally a native of Aſia, but from long cultivation naturalized in the ſouthern parts of Europe. Dr. Smith ſays that it is as common in the South of France as the bramble with us. Mr. Ray obſerved it wild on the walls of Rome, Sienna, and Florence. Between Marſeilles and Toulon and in many parts of Italy it is cultivated on a large ſcale for the ſake of the young buds of the flowers which are pickled for the table and exported in conſiderable quantities. The plants are raiſed from ſuckers ſet in a quincunx form about ten feet diſtant from each other. They require ſhelter from cold winds and a favourable expoſure to the ſun, and ſcarcely ever ſuffer from drought and heat. In ſpring, they need only one dreſſing; in autumn they are cut down to within ſix inches of the ground and covered with the ſurrounding earth, which is raiſed about them on all ſides. In the ſucceeding ſpring they are laid bare to the crown of the root and ſoon throw out young ſhoots. In an early part of the ſummer they begin to flower; and a ſucceſſion of them continues till they are deſtroyed by the cold of the advancing winter. The young buds of the flowers are carefully gathered every morning by women and children; for as they increaſe in ſize, they diminiſh in value. They are immediately thrown into veſſels full of vinegar with the addition of a little ſalt, and when a ſufficient quantity is collected, are ſold to the pickle merchants, who riddle them and diſtribute them in different parcels according to their ſize; then put them again in vinegar, and pack them up for ſale. The green fruit alſo, when it has attained to the ſize of an olive, makes a grateful pickle. Boſc. The pickled caper bud has the character of an antiſcorbutic, and of removing hepatic and other viſceral obſtructions; but the part of the plant which has chiefly been recommended for medicinal purpoſes is the bark of the root. Its taſte is ſomewhat aromatic, bitteriſh and acrid. By Dioſcorides and other ancient writers, it was thought of great efficacy as a deobſtruent, and in this view has been recommended by Foreſtus and Sennertus, but its uſe is now wholly laid aſide. Woodville. Though this plant, when trained againſt a wall, grows luxuriantly in the open air at Paris, it is preſerved with difficulty in England, and can ſcarcely be made to flower unleſs kept in a ſtove. 2. C. *ovata*, Willd. 2. Desfont. Fl. Att. 1. p. 404. (C. ſpinoſa, β. Linn. C. folio acuto; Bauh. pin. 460.) "Peduncles one-flowered, ſolitary; leaves roundiſh-egg-ſhaped, acute, ſmooth; capſules oval." A native of Sicily, Spain, and Barbary. According to Miller it is merely a variety of C. ſpinoſa. 3. C. *ægyptia*, Lam. Enc. 2. Willd. 3. "Peduncles ſolitary, one-flowered; leaves roundiſh-wedge-ſhaped, mucronate at the tip." Lam. A ſhrub. *Branches* ſtiff, ſlender, round, ſmooth, ſtipular ſpines two, crooked, gold-coloured. *Leaves* ſmall, about ſix lines long, and five at their greateſt breadth, glaucous, petioled. *Flowers* dull white; peduncle ſmooth, longer than the leaf. *Fruit* club-ſhaped, about three inches long and three lines thick. MSS. of Lipp. who obſerved it in Egypt, preſerved in the herbarium of Iſnard. 4. C. *tomentoſa*, Lam. Enc. 5. Willd. 4. (Cratæva Adanſ. Herb. Seneg. p. 41.) "Peduncles ſolitary; leaves oblong-egg-ſhaped, obtuſe, downy; ſiliques ſpherical." *Branches*, *leaves*, and *peduncles* covered with a ſhort, greyiſh, cottony down. *Stipular* ſpines two, crooked. *Leaves* about an inch and a half long, five or ſix lines broad, a little emarginate; petioles ſhort. *Flowers* axillary. Found by Adanſon in Senegal. 5. C. *pyrifolia*, Lam. Enc. 8. "Peduncles one-flowered, ſolitary, very ſhort; leaves lanceolate-egg-ſhaped, acuminate; younger ones downy." β. flowers faſciculated. A ſhrub. *Branches* ſlender, round, downy towards their ſummit; ſtipular ſpines two, ſhort, crooked. *Leaves* alternate, diſtant, petioled, three inches long, a little more than an inch broad. *Flowers* axillary; ſtamens very long. Found by Poivre in the Eaſt Indies, preſerved in the herbarium of Juſſieu. 6. C. *acuminata*, Willd. 5. "Peduncles in pairs, one-flowered; leaves egg-ſhaped, acuminate, covered underneath with a ruſt-coloured down." Willd. A ſhrub. *Branches* round, zigzag; ſtipular ſpines two, ſtraight. *Leaves* petioled, alternate. *Flowers* axillary, ſometimes three together; peduncles longer than the petioles; calyx downy; ſtamens longer than the corolla. A native of the Eaſt Indies, deſcribed from a dried ſpecimen by Willdenow, who doubts whether it differs ſpecifically from La Marck's *pyriſolia*. 7. C. *zeylanica*, Linn. Spec. 2. Willd. 6. Lam. 3. Mart. 2. Pet. Muſ. 625. Burm. Zeyl. 53. Ind. 118. Loureiro Cochinch. 330. "Peduncles ſolitary, one-flowered; leaves egg-ſhaped, acute at both ends." A ſhrub. *Stem* ſix feet high, upright, but weak; branches divaricating; ſpines two, ſmall, crooked. *Leaves* twice as long as broad, alternate, remote, entire, ſmooth on both ſides. *Flowers* axillary, ſometimes two together, white; petals oblong, ſpreading, nearly equal; with a lateral, prominent, cloven nectary; ſtamens thrice the length of the corolla. *Fruit* unknown to Linnæus. *Berry* black, roundiſh, fleſhy, ſmall, one-celled, with three ſeeds; peduncle long. Lour. A native of Ceylon and Cochinchina, in hedges. 8. C. *horrida*, Linn. jun. Sup. 264. Willd. 7. Mart. 3. Lam. 10. "Peduncles in pairs, one-flowered; leaves lanceolate-egg-ſhaped, mucronate, ſmooth." A tree. *Branches* ſtiff, zigzag; ſpines two, ſtrong, red. *Leaves* petioled. *Flowers* axillary. A native of the Eaſt Indies. 9. C. *erythrocarpus*, Willd. 8. Gmel. Syſt. 806. Iſert. Act. Soc. Berol. ix. p. 339. tab. 9. bad. "Peduncles ſolitary, one-flowered; leaves oblong, acuminate, mucronate; pericarps hexagonal." A ſhrub. *Branches* divaricated, round; ſtipular ſpines two, reflexed. *Leaves* alternate, petioled, ſmooth, beſet with ſtellated hairs here and there on the under ſurface, eſpecially on the midrib. *Flowers* axillary. *Fruit* red. A native of Guinea. 10. C. *divaricata*, Lam. 7. "Stem much branched, branches zigzag, divaricated; leaves linear, narrow, acute, nearly ſeſſile. Lam. A ſhrub, ſmooth in all its parts. *Branches* ſlender; ſpines two, ſhort, crooked. *Leaves* about an inch long, alternate, on very ſhort petioles. A native of the Eaſt Indies, preſerved in the herbarium of Juſſieu. Does it differ from the preceding? 11. C. *cantonienſis*, Mart. 18. Lour. Cochin. 331. "Flowers in racemes; leaves egg-ſhaped, acuminate, wrinkled." *Stem* ſhrubby, upright, branched. *Leaves* entire, ſmooth, alternate. *Flowers* white; calyx five-leaved; leaves oblong concave, coloured; petals five, oblong, ſpreading, the length of the calyx; filaments long. *Berry* egg-ſhaped, ſmall, brown, peduncled. *Seeds* numerous. A native of China about Canton. 12. C. *ſepiaria*, Linn. Sp. Pl. 3. Willd. 9. Mart. 4. Lam. 6. "Peduncles in umbels; leaves egg-ſhaped, emarginate." A ſhrub. *Branches* ſlender, round, zigzag, pubeſcent; ſpines two, crooked, ſhort, blackiſh at their ſummit. *Leaves* alternate, pubeſcent, on ſhort petioles. *Umbels* ſimple, terminal, many-flowered; common peduncles ſhort. A native of the Eaſt Indies. 13. C. *citrifolia*, Lam. 9. Willd 10. "Flowers in umbels; leaves oblong-egg-ſhaped, ſmooth, leathery." A ſhrub. *Branches* thick, ſtiff, ſmooth, pubeſcent towards their ſummit; ſpines two, crooked, placed near together. *Leaves* petioled, numerous and crowded. *Flowers* on ſhort peduncles, umbels terminating the branches. A native of the Cape of Good Hope, communicated to La Marck by Sonnerat. 14. C. *corymboſa*, Lam. 4. Willd. 11. (Cratæva, Adan. herb. Seneg. n. 41. A.) "Flowers in terminal corymbs; leaves oval, pubeſcent beneath." A ſhrub. *Branches* ſtiff, round, downy; ſpines two, crooked. *Leaves* petioled. *Flowers* peduncled; peduncles and calyxes pubeſcent. A native of Senegal.

** *Without ſpines.*

15. C. *cordiſolia*, Lam. 27. (C. mariana, Willd. 12.) "Peduncles ſolitary, one-flowered; leaves heart-ſhaped, petioled; younger ones covered with a mealy down." Lam. A ſhrub, reſembling in habit C. ſpinoſa. *Branches* cylindrical, full of pith. *Leaves* alternate, terminated by a blunt point, green on both ſides. *Flowers* axillary, white, large; peduncles ſhorter than the leaves; ſtamens a little longer than the petals. Found in the Marianne iſlands by Sonnerat. 16. C. *puticoſa*, Mart. 23. Mil. 7. "Peduncles ſolitary, one-flowered; leaves lanceolate, acute, perennial." *Stem* ſhrubby, from twelve to fourteen feet high, with a dark brown bark, and numerous ſtrong branches. *Leaves* of a thicker conſiſtence than thoſe of the Bay-tree, alternate, on ſhort petioles. *Flowers* axillary, ſmall, on ſhort peduncles; filaments white; anthers purpliſh. Sent to Mr. Miller from Tolu. 17. C. *arboreſcens*, Mart. 21. Mill. 3. "Peduncles ſolitary, one-flowered; leaves lanceolate-egg-ſhaped." *Stem* woody, from twelve to fourteen feet high, with a ruſſet bark and many branches. *Leaves* on long petioles. *Flowers* lateral, on long peduncles, ſimilar to thoſe of the next ſpecies. Sent to Mr. Miller from Carthagena in New Spain. 18. C. *Baducca*, Linn. Sp. Pl. 4. Willd. 12. Mart. 7. Lam. 13. (Badukka; Reed. Mal. 6. p. 105. tab. 57. Rai. hiſt. 1630. "Peduncles generally ſolitary, one-flowered; leaves perennial, oblong-egg-ſhaped, determinately crowded, naked." Linn. A ſhrub, five or ſix feet high. *Stem* the thickneſs of the human arm. *Leaves* alternate, acute, entire, ſmooth on both ſides, green, rather thick, ſoft, on ſhort petioles. *Flowers* axillary, and terminal, ſometimes two or three together, bluiſh white; petals unequal, wedge-ſhaped; ſtamens the length of the petals. 19. C. *ampliſſima*, Willd. 23. Lam. 14. (C. conſerta, Mart. 24. Mill. 8.? C. alia arboreſcens, lauri foliis, fructu oblongo ovato; Plum. Spec. 7. ic. 73. fig. 2.) "Peduncles one-flowered, ſolitary; leaves elliptical, ſmooth, veined; ſtamens longer than the corolla; fruit inverſely egg ſhaped." Confounded by Linnæus with the preceding. A conſiderable tree, with a thick, blackiſh wrinkled bark. *Leaves* towards the ſummit of the branches, numerous, alternate, of a beautiful green; reſembling thoſe of laurel, but larger, thicker, and leſs acute. *Flowers* axillary and terminal, large, white; petals concave, an inch and half long; ſtamens white, numerous, much longer than the petals; peduncles long. *Fruit* larger than a gooſe egg, fleſhy; rind thick, wrinkled. A native of Hiſpaniola. 20. C. *toruloſa*, Willd. 15. Mart. 19. Swartz. Prod. 81. (Breynia arboreſcens ſiliqua toroſa; Brown Jam. 246.) "Peduncles generally two flowered, terminal; leaves lanceolate-oval, dotted with white underneath, ſiliques round, linear, ſwelling into ſmall protuberances." A ſhrubby tree. Native of Jamaica. 21. C. *ſaligna*, Willd. 25. Vahl. Symb. 3. p. 66. "Peduncles two or three-flowered, ſolitary, terminal; leaves linear-lanceolate, dilated on each ſide towards the baſe, ſmooth; fruit round, ſwelling into ſmall protuberances." *Branches* round, zigzag, ſmooth, with an aſh-coloured bark. *Leaves* three inches long, a quarter of an inch broad towards the ſummit, generally broader towards the baſe, petioled, alternate, entire, mucronate, rounded, or a little heart-ſhaped towards the baſe, veined, ſmooth; petioles ſhort; frequently with ſmall axillary glands. *Calyx-leaves* rounded, leathery. *Filaments* numerous, very long, capillary, ſmooth. *Germ* linear-oblong, truncate. *Berry* two or three inches long, the thickneſs of a ſwan's quill, obtuſe, ſmooth, compreſſed between each ſeed; pedicel longer than the fruit. Seeds two or five. A native of St. Crux: Q. does it ſpecifically differ from the preceding? 22. C. *triflora*, Mart. 25. Mill. 10. "Peduncles three-flowered, terminal; leaves lanceolate, nerved, perennial." *Stems* ſhrubby, ſlender, ſeven or eight feet high, much branched. *Flowers* ſmall, white.

*Fruit* oval. Cultivated by Mr. Miller, but no native place mentioned. 23. C. *pulcherrima*, Linn. Sp. Pl. p. 1674. Willd. 26. Mart. 9. Lam. 25. Jacq Amer. 163. tab. 106. pict. 80. tab. 155. "Flowers in racemes; leaves oblong, obtuſe; berries roundiſh." An elegant, upright ſhrub; in open dry ſituations only two or three feet high, in woods twelve. *Branches* round, ſmooth. *Leaves* often ten inches long, alternate, petioled, entire, leathery,. ſhining. *Raceme* terminal, ſimple, upright, ſix inches long, handſome. *Flowers* pale yellow, ſweet ſcented; filaments at firſt white, then of a beautiful purple. *Berry* yellowiſh; pulp or fleſh when unripe, hard, with little ſcent; when ripe, ſoft, fetid and nauſeous. *Seeds* kidney-ſhaped, a little compreſſed, enveloped in a white, thin, ſtrong membrane. A native of Carthagena in New Spain, on the declivities of mountains. 24. C. *tenuiſiliqua*, Willd. 27. Lam. 23. Jacq. Amer. 162. tab. 105. "Racemes erect, terminal; leaves lanceolate-egg-ſhaped, acute; ſiliques cylindrical." A ſhrub, with few branches; in ſhady places fifteen feet high. *Leaves* alternate, petioled, ſhining, deciduous. *Racemes* ſimple, ſix or ſeven inches long, containing about fifty greeniſh white, ſcentleſs flowers, which open in ſucceſſion about the month of April, after the fall of the leaf. *Siliques* ſlender, ſix or ſeven inches long. A native of New Spain about Carthagena. 25. C. *linearis*, Linn. Sp. Pl. p. 1674. Willd. 28. Mart. 10. Lam. 20. Jacq. Amer. 161. tab. 102. "Peduncles ſomewhat racemed; leaves linear." A tree. *Stem* about fifteen feet high, upright, branched, elegant. *Leaves* four inches long, entire, leathery, blunt, with a very protuberant midrib; the ſides often revolute; petioles ſhort. *Flowers* about ten in a raceme, white, large, ſcentleſs. *Racemes* terminal or axillary. *Siliques* about an inch long, orange-coloured, ſwelling into protuberances. A native of New Spain about Carthagena. 26. C. *nemoroſa*, Lam. 26. Jacq. Amer. 164. tab. 181. "Flowers in racemes; leaves acuminate; fruit berry-ſhaped." A tree. *Stem* twenty feet high, uprigh, branched. *Leaves* leathery, ſhining above, covered beneath with a down, which rubs off when touched, and diſappears as the leaf grows old. *Fruit* oval-oblong. A native of woods near Carthagena. 27. C. *falcata*, Mart. 17. Loureiro Cochin. 331. "Flowers in racemes; leaves ternate, ſickle-ſhaped." A large tree with ſpreading branches. *Leaves* lanceolate-egg ſhaped; lateral ones ſickle-ſhaped at the baſe; entire, ſmooth, petioled. *Flowers* white; ſtamens eighteen. *Berry* oblong, red, large, one-celled, peduncled. *Seeds* many, bedded in the pulp. A native of China. 28. C. *racemoſa*, Mart. 22. Mil. dict. 5. "Flowers in racemes; leaves egg-ſhaped, oppoſite, perennial." A tree. *Trunk* about twenty feet high; branches numerous, long, ſlender; with a brown bark. *Leaves* like thoſe of the Bay-tree, but longer and deeply ribbed on their under ſide, on rather long petioles. *Flowers* large, white. *Siliques* two or three inches long, the thickneſs of a man's little finger, fleſhy. *Seeds* large, kidney-ſhaped. 29. C. *panduriformis*, Lam. 28. Willd. 13. "Peduncles one-flowered, aggregate, terminal; leaves oblong, fiddle-ſhaped." *Stem* ſhrubby. *Leaves* four inches long, an inch and half broad, alternate, acute, ſmooth, on ſhort petioles. A native of the Iſle of France, found by Sonnerat. 30. C. *haſtata*, Linn. Sp. Pl. 10. Willd. 30 Mart. 12. Lam. 21. Jacq. Amer. 159. tab. 174. fig. 56. "Peduncles many-flowered; leaves lanceolate-halberd-ſhaped, ſhining." An upright, weak ſhrub; branches few, often ſix feet long. *Leaves* alternate, petioled, from three to ſeven inches long, leathery. *Flowers* purple, ſweet-ſcented, in terminal racemes. 31. C. *Breynia*, Linn. Sp. Pl. 7. Willd. 29. Mart. 11. Lam. 16. Jacq. Amer. 161. tab. 103. (Breynia elæagni foliis; Plum. *gen.* 40. Breyn. ic. 13. c. *fig.*) "Peduncles in racemes; leaves permanent, oblong; peduncles and calyxes downy; flowers octandrous," Linn. "Peduncles many-flowered; leaves lanceolate-egg-ſhaped, ſhining above, rough with ſcaly points beneath; ſiliques round, ſwollen with the ſeeds, a little ſcaly." Lam. A ſhrub, or ſmall tree with the habit, according to Plumier, of an almond-tree or an Oleaſter. *Stem* upright, ſmooth; branches zigzag, brown, ſcarred with the fallen leaves, covered near the ſummit with ſmall ruſſet or ferruginous ſcales. *Leaves* little more than two inches long and one broad, alternate, ſmooth and ſhining above, hoary-ferruginous and roughiſh, with a mixture of ſilvery and ferruginous, very ſmall ſcales or dots beneath, ſimilar to thoſe of Hippophæ, ſome ſpecies of Ciſtus, and a few other plants; petioles angular, hoary-ferruginous. *Flowers* rather large, white, tinged with purple, very ſweet-ſcented, peduncles terminal, and axillary from the upper leaves, forming a ſort of corymb, from two to four-flowered; calyx-leaves reflexed, convex, white on the inſide, ferruginous beneath, and ſomewhat rugged; petals twice as large as the calyx, entire, ſpotted with ruſt colour on the outſide, deciduous; nectariferous glands four, ſmall, egg-ſhaped, acute, compreſſed, permanent; filaments long, meeting at the baſe round the germ, covered with a pale red pile, eight according to Plumier's figure; but Reichard aſſerts that they are more, and that the ſpecies is properly polyandrous; anthers almoſt erect, acuminate, curved inwards, yellow; germ elongated, minute, on a ſhort pedicel; ſtyle the length of the ſtamens; ſtigma thickened, obtuſe, ferruginous. *Fruit* from three to five inches long, cylindrical, two-valved. *Seeds* kidney-ſhaped. A native of the ſea-coaſt in the Weſt Indies. 32. C. *ſiliquoſa*, Linn. Sp. Pl. 6. Lam. 19. Mart. 14. (C. Breynia *β*. Willd.) "Peduncles one-flowered, compreſſed; leaves permanent, lanceolate-oblong, acuminate, dotted beneath." Linn. A native of Jamaica. *β*. leaves linear, narrow, very acute. A native of the Antilles. *Leaves* four or five inches long, ſmooth above, beſet with ſilvery and ferruginous ſcales beneath. Seen by La Marck in the herbarium of Juſſieu. 33. C. *ferruginea*, Linn. Sp. Pl. 8. Willd. 18. Mart. 6. Swartz. Obſ. 208. (C. octandra, Jacq. Amer. 160. tab. 100. bad. Cratæva foliis ſingularibus, Brown. Jam. 247. tab. 28. fig. 1. good. C. amygdalina, Lam. 17.?) "Peduncles in umbels; leaves permanent, lanceolate, downy beneath; flowers octandrous." Linn. A ſmall tree or ſhrub. *Branches* ſtriated, ferruginous. *Leaves* oppoſite, entire, ſmooth above, lanuginous-aſh-coloured beneath; petioles ferruginous, ſhort. *Flowers* white, terminal, on bifid and trifid peduncles, forming a corymb rather than an umbel, fragrant; calyx four-cleft, flat at the baſe, permanent; ſegments ſpreading, equal, acute; petals equal, concave; claws inſerted into the diviſions of the calyx, and of the ſame length; nectaries four, egg-ſhaped, placed between the petals and the column of the piſtil; filaments ſeldom more than eight, fixed to the pedicel of the germ, ſhorter than the corolla; anthers oblong, inſerted into the filaments; germ egg-ſhaped, on a round pedicel, half the length of the corolla; ſtigma ſeſſile, club-ſhaped. *Berry* fleſhy, oblong. *Seeds* five or ſix, oblong, Swartz. The plant is ſtrongly impregnated with an acrid, volatile ſalt, like the muſtard tribe; and hence, in Jamaica, where it grows wild, it is called the muſtard plant. Browne miſled by this circumſtance, and the regularity of the calyx, petals, and nectaries, referred it to the claſs tetradynamia. Martyn's Miller. La Marck gives the following ſpecific character and deſcription of his C. amygdalina, which he conjectures may be the ferruginea of Linnæus. "Peduncles many-flowered; leaves oblong-lanceolate; veined, ſmooth above; ſcaly-ſilvery beneath." Young branches, petioles, peduncles, and calyxes covered, like hippophæ rhamnoides, with ferruginous ſcales. *Leaves* alternate, petioled, acute, ſmooth above, but not ſhining like thoſe of C. breynia; covered beneath with ſmall, ſilvery, roundiſh ſcales, having a ferruginous dot in the middle; from three to four inches long, and ſcarcely an inch broad. *Flowers* rather ſmall, terminal, ſeveral together, on ſhort peduncles. *Siliques* five or ſix inches long, cylindrical, a little ſwollen by the ſeeds, and of a reddiſh colour. A native of the Antilles, and deſcribed from a dried ſpecimen in the herbarium of Juſſieu. 34. C. *odoratiſſima*, Willd. 21. Jacqr. hort. Schreb. 1. p. 57. tab. 110. "Peduncles many-flowered; leaves oblong-lanceolate, dotted with ſcales beneath." *Leaves* attenuated and rounded at the baſe, acute at the ſummit. *Flowers* the ſize of thoſe of the common myrtle. *Petals* violet. *Stamens* a little longer than the corolla. The ſpecific character as given by Willdenow is not ſufficiently diſcriminative. 35. C. *longifolia*, Willd. 16. Mart. 20. Swartz Prod. 81. Pluk. phyt. tab. 327. fig. 6. "Infloreſcence unknown; leaves linear-lanceolate, with mealy dots underneath." A native of Jamaica. 36. C. *jamaicenſis*, Willd. 20. Lam. 22. Jacq. Amer. 160. tab. 101. "Peduncles many-flowered; leaves oblong, obtuſe, emarginate, downy beneath; corolla ſemi-erect, or bell-ſhaped." A ſhrub about ſix feet high, upright, branched, buſhy; old branches ſmooth, blackiſh; young ones downy, aſh-coloured. *Leaves* alternate, petioled, leathery, two inches long. *Flowers* yellowiſh white, fragrant; peduncles downy, terminal, and axillary. A native of Jamaica. 37. C. *cynophallophora*, Linn. Sp. Pl. 5. and C. flexuoſa. Sp. Pl. 9. Willd. 24. Mart. 8. Lam. 15. Jacq. Amer. 158. tab. 98. C. arboreſcens, fructu longiſſimo. Plum. Sp. 7. ic. 73. fig. 1. (Cynophallophorus, Pluk. 126. tab. 172. fig. 4. moriſonia flexuoſa, Amæn. Acad. 5. p. 398. Breynia foliis oblongis obtuſis, Browne Jam 246. tab. 27. fig. 1. Acaciæ affinis, ſiliqua tereti ventricoſa interiore tunica mucoſa miniata, Sloane Jam. 1538. hiſt. 2. p. 59.) "Peduncles many-flowered, terminal; leaves elliptical, obtuſe, ſmooth; glands axillar; fruit cylindrical, ſwollen by the ſeeds." Willd. A ſhrub twelve feet high in a good ſoil. *Branches* long, weak, pendant, or ſupported by the neighbouring ſhrubs. *Leaves* about three inches long, alternate, ſmooth, veined, on ſhort peduncles. *Flowers* white, large, very fragrant; ſtamens often four inches long. *Siliques* about ſix inches long, as thick as the human finger, opening longitudinally by two valves. *Seeds* kidney-ſhaped, very white, bedded in the bright ſcarlet fleſh, or pulp of the valves. A native of the Weſt Indies, ſent to Mr. Miller from Carthagena. Willdenow makes the flexuoſa of Linnæus a variety, but according to Martyn, it has been determined from an imperfect ſpecimen in the Linnæan herbarium, to be in no wiſe different from C. cynophallophora. 38. C. *verrucoſa*, Willd. 22. Lam. 24. Jacq. Amer. 159. tab. 29. "Peduncles many-flowered; leaves oblong, acute, gloſſy on both ſides; fruit warty." Habit of the preceding. *Axillary* glands none. *Flowers* white, very open, with little ſmell; nectariferous glands flat, umbilicated; ſtamens an inch long, not much longer than the corolla. *Silique* oblong, round, green, ſhining, entirely covered with warts, two-valved, about an inch and half long; pulp white. Jacq. A native of thickets about Carthagena. 39. C. *frondoſa*, Linn. Sp. Plant. p. 1674. Willd. 17. Mart. 5. Lam. 12. Jacq. Amer. 162. tab. 104. "Peduncles in umbels; leaves crowded on all ſides." A ſhrub commonly about ſeven feet high, but in thick ſhady woods not leſs than twenty; branches few. *Leaves* varying in ſize, the largeſt near a foot long, broad-lanceolate, acuminate, ſmooth, nerved, veined. *Flowers* an inch in diameter, greeniſh, or purple, ſcentleſs; common peduncle round, ſhining, erect, terminal. *Fruit* cylindrical, an inch and half long, ſhining, dark purple; fleſh whitiſh. A native of South America. 40. C. *grandis*, Linn. jun. Supp. 263. Willd. 19. Mart. 15. Lam. 11. "Corymbs terminal; leaves egg-ſhaped, acute, ſmooth; fruit globular." A large hoary tree. *Leaves* alternate, entire, veined. *Flowers* pale yellow, in terminal corymbs, which are finally elongated into racemes. *Fruit* large. A native of the iſland of Ceylon. 41. C. *magna*, Mart. 16. Loureiro Cochin. 331. "Corymbs terminal; leaves ternate, lanceolate." A middling ſized tree. *Branches* ſpreading. *Leaves* entire, ſmooth. *Flowers* large, white; calyx wheel-ſhaped; ſegments lanceolate, flat, interrupted; petals broad-egg-ſhaped, ſharp at both ends, many-nerved, veined, ſpreading, equal, with long claws; filaments twenty-four, very long; anthers three-celled, oblong, recurved; germ roundiſh, pedicelled; ſtyle ſhort. *Berry* two inches long, roundiſh, fleſhy, eatable, dotted, rough, one-celled. *Seeds* numerous, kidney-ſhaped, bedded in the fleſh, or pulp. A native of Cochinchina, much reſembling C. grandis, and differing from it chiefly in its ternate leaves. 42. C. *oblongifolia*, Lam. 29. Forſk. Ægyp. p. 99. "Leaves oval-oblong, obtuſe, but ending in a ſharp pointed tooth, perennial." 43. C. *mithridatica*, Lam. 30. Forſk. Ægyp. 99. "Leaves alternate, pendulous, linear-lanceolate."

Obſ. The fruit of this remarkable genus merits a more accurate inveſtigation. Authors are not agreed what it ſhould be called in ſeveral of the ſpecies, and ſeem to have given it a name rather from its external form, than from a proper regard to its internal ſtructure.

*Propagation and Culture.*—Theſe plants can be raiſed in England only from ſeeds, which ſhould be brought over in the capſules wrapt up in well-dried tobacco leaves to preſerve them from inſects. As they germinate immediately when freſh, it is not eaſy to get them dry to Europe; on that account they are ſcarce in our ſtoves, although many of them were cultivated by Miller. The ſeeds ſhould be ſown in ſmall pots, filled with light ſandy earth, and plunged into a hot-bed of tanners-bark; and ſhould be allowed only a ſmall quantity of water. They will frequently remain in the ground a whole year before they vegetate, and therefore require protection in winter. In the ſpring following, the pots muſt be plunged into a freſh hot-bed, and when the plants are come up, ſhould have much air and little water. When large enough to remove, they ſhould be tranſplanted ſingly into ſeparate pots. In autumn they muſt be taken into the ſtove, and plunged into the hot-bed, where they ſhould conſtantly remain, and be treated like other plants from the ſame countries, but ſhould never have much water. Miller.

CAPPARIS *Moriſonia*, (Swartz.) See MORISONIA.

CAPPARIS *Fabago*, (Dodoens.) portulacæ folio, (Bauh. pin.) See ZYGOPHYLLUM *Fabago*.

CAPPEL, LEWIS, in *Biography*, an eminent French Proteſtant divine and Scripture critic, was born at Sedan in 1585; and becoming miniſter and Hebrew profeſſor at Saumur, he diſtinguiſhed himſelf in the controverſy concerning the antiquity of the Hebrew vowel-points. His elaborate work, entitled "Arcanum punctuationis revelatum," Leyd. 1624, contains ſtrong arguments to prove that the points were not uſed by the original Hebrew writers, but were added to the text by the Maſorites. He alſo maintains, that the characters of the Hebrew text were thoſe uſed by the Chaldæans after the Babyloniſh captivity, and that before that period the Jews always employed the Samaritan character. The members of the reformed and Lutheran churches were alarmed by this hypotheſis, conceiving that it tended to diminiſh the authority of Scripture, and to reduce it to a level with tradition. The Roman Catholics, on the other hand, eagerly adopted it. It is affirmed, however, that the leaders of the reformation, Luther, Zuingle, and Calvin, were of the ſame opinion, and the hypotheſis is now very generally received. Cappel, unintimidated by oppoſition, purſued his plan, and in his famous work, entitled, "Critica Sacra," fol. Paris, 1650, produced a number of various readings, and a liſt of the errors of copyiſts in the Bible, accompanied with critical remarks. See Bible. The printing of this work was delayed for 10 years, by the oppoſition it met with at Geneva, Sedan, and Saumur; till at length a ſon of Cappel, who was a convert to popery, obtained permiſſion by the intereſt of fathers Petau, Morin, and Merſenne, to print it at Paris. It was warmly attacked by John Buxtorf, in his "Anticritica," and by other divines; but Grotius, in a letter to the author, expreſſed his approbation of the work. Cappel likewiſe publiſhed "Sacred Chronology," Paris, 1655, which is printed by Walton in the Prolegomena to his Polyglott. After his death were printed his "Commentaries, theological and critical, on the Old Teſtament," together with the defence of his "Arcanum," at Amſterdam, 1689, fol. This learned writer died at Saumur in 1658. Moreri. Moſheim, E. H. vol. v. p. 377, &c.

Cappel, in *Geography*, a place of Swiſſerland, in the canton of Zurich, where, on account of a religious diſpute, a battle was fought between the Catholics and Proteſtants, in 1531, in which Zuingle, the reformer, loſt his life; 9 miles S. of Zurich.

Cappel, or Waldkapel, a town of Germany, in the circle of the Upper Rhine, and principality of the Upper Heſſe; 22 miles S.E. of Caſſel.

Cappel, or Kappel, a ſmall but neat town of Denmark, in the duchy of Sleſwic, on the eaſt coaſt; 16 miles N.E. of Sleſwic. It contains about 550 inhabitants, who are induſtrious, and carry on ſome trade, exporting bacon, cheeſe, butter, eggs, and other commodities to Copenhagen, and ſupplying the interior parts of the province with coffee, ſugar, ſpices, and other foreign merchandiſe. The environs of Cappel are very pleaſant, being grounds gently riſing, ſprinkled with much wood, and commanding fine views of the bay. N. lat. 54° 44′. E. long. 10°.

CAPPELLA, *Ital.* a *chapel.* This ſubſtantive is rendered a muſical term on many occaſions, as *maeſtro di cappella,* a chapel maſter, or the director and compoſer of a chapel eſtabliſhment, a coryphæus. *A cappella,* muſic in a chapel or church ſtyle. But the title of *maeſtro di cappella* is not confined to eccleſiaſtical compoſers and maſters of a choir, but is extended to compoſers of an opera, and to compoſers in general. Nor does *cappella* always imply that a prince or nobleman who retains a band of vocal and inſtrumental performers in his ſervice, has choral duty daily performed in his chapel; but that he has a band for his evening or occaſional concerts, in his palace or manſion; as was the caſe with the duke of Chandos, at Cannons, in the beginning of the laſt century.

CAPPELLINE, in *Heraldry,* a mantling, or a ſort of covering or hood, repreſented entire; not cut, and hanging back over the neck of the wearer. See Mantling.

CAPPELLO, Bernardo, in *Biography,* a celebrated Italian poet, was born at Venice about the beginning of the 16th century, and imbibed from Bembo, with whom he was intimate, the principles of Italian poetry. To his judgment, however, Bembo ſubmitted his own poems. Cappello, in conſequence of an opinion maintained by him in the ſenate, which was thought to be dangerous to the public tranquillity, was baniſhed in 1540, to the iſle of Arbe in Sclavonia, where he continued two years; but being cited to give an account of his conduct, he thought it moſt prudent to ſeek refuge, with his wife and family, in the eccleſiaſtical ſtate, where he was honourably received by cardinal Alexander Farneſe, and appointed governor of Orvieto and Tivoli. After ſpending ſome time at the court of Urbino, the reſort of the fineſt geniuſes of Italy, he was induced, on account of the inſalubrious air of Piſaro, to return to Rome in 1559, where he died in 1565. The "Canzonier" of Cappello is much celebrated, as an excellent model for ſtudents in poetry. A new edition of his poems, together with thoſe of Domenico Vaniero, was publiſhed in Bergamo in 1751 and 1753. Tiraboſchi. Gen. Biog.

CAPPELN, in *Geography,* a town of Germany, in the circle of Weſtphalia, and county of Tecklenburg; 8 miles N.N.E. of Tecklenburg.

CAPPENBERG, a town of Germany, in the circle of Weſtphalia, and biſhopric of Munſter; 6 miles N.W. of Werne.

CAPPENDU, a town of France, in the department of the Aude, and chief place of a canton in the diſtrict of Carcaſſonne; the place contains 586, and the canton 4644 inhabitants: the territory comprehends 167½ kiliometres and 11 communes.

CAPPEROL Coronde, a name given by the Ceyloneſe to a peculiar kind of cinnamon, eſteemed the third in value: this has a very ſtrong taſte and ſmell of camphor, and its name with the natives ſignifies camphorated cinnamon. The tree which produces it, grows very plentifully in many parts of the iſland of Borneo, but it is not met with in the eaſtern parts of it. This is often ſold to the Danes and Engliſh who come to trade on the coaſts of Coromandel; it is prohibited exportation from the iſland, but ſo long as only one port is open, there are people enough who will carry out great quantities of it.

There is a ſpecies of canella very much reſembling this kind of cinnamon-tree, which grows very frequently on the continent of India toward Goa; and another canella or wild cinnamon on the coaſt of Malabar, in many reſpects reſembles this. The barks of all theſe trees are greatly inferior to the true cinnamon in ſmell, taſte, and virtue; yet they are too often ſold to the leſs judicious traders in theſe things, either alone or mixed with the ſeveral better kinds of cinnamon, to the great damage of all that afterwards buy them. Phil. Tranſ. N° 409.

CAPPERONNIER, Claude, in *Biography,* a learned philologiſt, was born at Montdidier, in Picardy, in 1671. After having acquired, by his own ſtudy, the rudiments of the Latin tongue, he proſecuted his ſtudies for 18 months at the college of Montdidier, then at the Jeſuits' college of Amiens, and laſt of all in a ſeminary at Paris. Having taken orders, and ſupported himſelf by the profits of a ſmall benefice, and by teaching the claſſics, he obtained the patronage of M. Coleſſon, who had been his pupil, and in 1706 was admitted into his houſe, where he continued ten years, applying with great aſſiduity to the ſtudy of the Greek authors. Declining the offer of a Greek profeſſorſhip in the univerſity of Baſil, he determined, in 1710, to undertake the education of the children of M. Crozat, and continued in his family to the cloſe of his life. In 1722, he was nominated profeſſor of Greek in the royal college of Paris, and on his introduction to this office he delivered a Latin oration on the uſe and excellence of the Greek language, which was much applauded. In 1725 he publiſhed an excellent edition of "Quintilian" in folio, for which he received a penſion from the king, to whom it was dedicated. Burman rudely criticiſed it; but the editor defended it with politeneſs and modeſty. In 1719 he printed "An Apology for Sophocles," as a reply to the criticiſms of Voltaire on the Oedipus of this tragedian. He died in 1744, leaving a character of amiable ſimplicity, great piety and probity, and ſingular benevolence and kindneſs. He was diſtinguiſhed by a very retentive memory. Among various works which he left for the preſs were an edition of the "Antiqui Rhetores Latini," with notes and illuſtrations, publiſhed at Straſburg in 1756, 4to.; and "Philological Obſervations" on Greek and Latin authors, which would amount to ſeveral volumes in 4to. He alſo completed a "Treatiſe on the ancient Pronunciation of the Greek language," and made great additions and corrections to Stephens's Latin Theſaurus.

Capperonnier, John, the relation of the former, and his ſucceſſor in the Greek profeſſorſhip, publiſhed an edition of "Cæſar's Commentaries," 2 vols. 12mo. 1755, and of the "Comedies of Plautus," 3 vols. 12mo. 1759. He died at the age of 59, in 1775. Nouv. Dict. Hiſt.

CAPPERS, a denomination given in our ſtatutes (13 Eliz. c. 19. A. D. 1571) to the knit-cap makers, who manufactured caps of wool, and who obtained encouragement in oppoſition to thoſe who made hats of felt, and who imported foreign materials for this purpoſe. But knit-caps have been long ſince diſuſed.

CAPPONI, or Capponio, John Baptist, in *Biography*, a phyſician, poet, and aſtrologer, was born at Bologna in Italy, in the early part of the 17th century. He taught philoſophy and medicine at Bologna, where he publiſhed, under the name of Chariſius Thermarius Spado, "Animadverſiones in Joannis Caroli Sorcii Opuſculum de Febribus." After his death, which happened Nov. 16th, 1676, the following were printed: "Lectiones Phyſicæ Morales;" "De Morbis particularibus;" "De Humano Semine nequaquam animato;" "De Erroribus Clarorum Virorum Latinorum;" "Parodoxon Philoſophiæ Democraticæ." He is ſaid to have meditated, and in part executed, a general hiſtory of medicine, but it was never publiſhed. Eloy. Dict. Hiſt.

CAPPOQUIN, in *Geography*, a ſmall town of the county of Waterford, province of Munſter, Ireland, ſituated on the river Blackwater, which here takes a ſouthern direction, and becomes navigable. There is a wooden bridge here over the Blackwater, which was rebuilt at the expence of the ſouthern counties in the reign of Charles II. and which is now almoſt impaſſable. The ruins of the caſtle are near the bridge, and the whole town appears neglected and going to decay, notwithſtanding its advantages for trade, and the richneſs of the adjoining country. The road from this to Liſmore is remarkably beautiful; and the proſpects from the high grounds above the town can ſcarcely be ſurpaſſed. It is 98 Iriſh miles S.W. from Dublin, and 5 miles eaſt of Liſmore. N. lat. 52° 9′. W. long. 7° 53′. Smith's Waterford, &c.

CAPRA, in *Aſtronomy*, a denomination given to the ſtar Capella; and ſometimes alſo to the conſtellation Capricorn. Some repreſent *Capra*, or the *ſhe-goat*, as a conſtellation in the northern hemiſphere, conſiſting of three ſtars, compriſed between the 45th and 55th degree of latitude. The poets ſay, it is Amalthea's goat, which ſuckled Jupiter in his infancy. Horace, making mention of it, calls it, *Inſana ſidera Capræ*.

Capra, Marcellus, in *Biography*, a native of the iſland of Cyprus, where he appears to have practiſed medicine during the early part of his life. Induced at length to quit his native country, he went to Meſſina, where he ſoon became ſo diſtinguiſhed as to be appointed by the magiſtrates phyſician to the city. This happened about the year 1570. He was author of ſeveral abſtruſe, metaphyſical works, ſuiting the humour of the time; but what alone ſeems deſerving notice, is his account of a fatal epidemic prevailing in the iſland of Sicily, during the years 1591 and 2. "De Morbi Epidemici qui miſerrime Siciliam depopulabat Anno 1591 itidemque 1592, Cauſis, Symptomatibus, et Curatione," Meſſanæ, 1593, 4to. Haller Bib. Med. Eloy. Dict. Hiſt.

Capra, in *Geography*, a ſmall Greek iſland, N.W. of the iſle of Stancho, inhabited only by goats, as its name imports.

Capra, in *Zoology*, a genus of the *Mammalia* claſs in the order *Pecora*.

The quadrupeds of this tribe have the horns hollow, turning upwards, and bent back, compreſſed, and rough: front teeth in the lower jaw eight: canine teeth none: chin bearded.

Theſe are the goats of Engliſh writers, including our common goat, and its numerous varieties. The ſpecies of this genus already aſcertained are few, amounting only to two, or three at the utmoſt, if the domeſticated goat, *Capra hircus*, be conſidered as the genuine offspring of either of thoſe ſpecies known in a ſtate of nature at this time. It is thought by many, and the opinion is highly probable, that our common goat originated from the *Caucaſan ibex*, *Capra ægagrus*, or perhaps from the Ibex goat, *Capra Ibex* of Linnæus. We can ſay but little as to the third ſpecies that might have been the parent ſtock of our preſent race of domeſtic goats, the *Capra caucaſica* of Güldenſtedt deſcribed in the Tranſactions of the Ruſſian Academy for the year 1779; becauſe it appears rather doubtful whether we ought to admit it as a ſpecies altogether diſtinct from capra ægagrus, or not.

In the twelfth edition of the Syſtema Naturæ, the capra genus will be found far more extenſive; Linnæus having claſſed ſeveral animals of the antelope tribe as ſpecies of this genus. The Swediſh naturaliſt was unqueſtionably juſtified in this reſpect, both by his own opinion, and by the example of ancient writers with ſcarcely an exception from the time of Pliny. They had, for inſtance, uniformly conſidered the chamois as appertaining to the race of goats; it was their *rupicapra*, and even to this day it paſſes under the trivial name of the chamois goat, though in the ſyſtematic writings of modern zoologiſts it claſſes in the genus antelope. That the natural generical diſtinctions, if they may be ſo expreſſed, obſervable between the goat and the antelope tribes did not ſtrike the mind of Linnæus may be preſumed as evident; there was but an inconſiderable number (about ſix ſpecies) of the antelope known in his time, and thoſe he placed without heſitation with the goats in his genus capra.

The obſervations of later naturaliſts prove ſufficiently that Linnæus might have ſeparated the goats from the antelopes with much propriety: were we to diſtruſt the truth of this aſſertion, the writings of Pallas, of Schreber, Erxleben, Güldenſtedt, Pennant, and Sonnini muſt ſilence every doubt. Gmelin, the editor of the laſt edition of the Syſtema Naturæ, has availed himſelf of theſe recent authorities, the antelopes are ſeparated from the goats under the generic name of antilope, the goats retaining the original appellation of capra.

A principal diſtinction between the two genera conſiſts in the ſtructure of the horns, thoſe of the antelope being round and nearly cylindrical, and either twiſted ſpirally, or annulated: the teeth are exactly the ſame in both; but the chin of the goat is bearded, while that of the antelope is not. A further very ſtriking difference between the goat and the antelope is obſervable in the general figure of theſe animals. The goat is robuſt, ſtrong, vigorous, petulant, and fearleſs; the antelope is of a graceful form: its limbs long and ſlender: its diſpoſition timid, harmleſs, active, and watchful; and in the chace, when purſued on the open plains, its courſe incomparably more ſwift than that of the goat.

Beſides, therefore, the peculiar ſtructure of the horns, and other characteriſtic particulars laid down by ſyſtematic writers, the manners and habits of life ſufficiently prove that a line of ſeparation ought to be drawn between the antelope and the goat. Mr. Pennant in his preface to the Synopſis of Quadrupeds treats on this ſubject at ſome length: his remarks are uſeful, and although they relate more immediately to the antelope than the goat, the leading points of his argument may be properly noticed in this place.—"The antelopes (ſays this author), two or three ſpecies excepted, inhabit the hotteſt parts of the globe; or at leaſt, thoſe parts of the temperate zone that lie ſo near the tropics as to form a doubtful climate. None, therefore, except the Saiga, and the chamois, are to be met with in Europe; and notwithſtanding the warmth of South America is ſuited to their nature, not a ſingle ſpecies has yet been diſcovered in any part of the new world. Their proper climates ſeem, therefore, to be thoſe of Aſia and Africa, where the ſpecies are very numerous."—"As there appears a general agreement in the nature of the ſpecies that form this great genus, it will prevent needleſs repetition to obſerve, that the antelopes are animals generally of a moſt elegant and active make; of a reſtleſs and timid diſpoſition; extremely watchful; of great vivacity; remarkably ſwift and agile, and moſt of their boundings ſo light, ſo elaſtic, as to ſtrike the ſpectator with aſtoniſhment."—"Antelopes generally reſide in hilly countries, though ſome inhabit plains; they often brouſe like the goat, and feed on the tender ſhoots of trees, which gives their fleſh an excellent flavour. This is to be underſtood of thoſe which are taken in the chace; for thoſe which are fattened in houſes are far leſs delicious. The fleſh of ſome ſpecies is ſaid to taſte of muſk, which perhaps depends on the qualities of the plants they feed upon."—"This preface (ſays Pennant) was thought neceſſary, to point out the difference in nature between this and the goat kind, with which moſt ſyſtematic writers have claſſed the antelopes: but the antelope forms an intermediate genus, a link between the goat, and the deer; agreeing with the former in the texture of the horns which have a core in them and are never caſt; and with the latter in elegance and ſwiftneſs."

From the tenor of the preceding obſervations it will be perceived that the lateſt and beſt informed zoologiſts conſider it as a decided point that the antelopes and the goats ought to be ſeparated, and we ſhall therefore ſpeak of the ſpecies of Capra as they ſtand independent of the genus antilope.

Capra *Ibex.* Horns on the upper ſurface knotty, and bending over the back: throat bearded. Briſſ. reg. an.—Linn.

*Ibex* of Pliny, Geſner, Aldrovandus.—*Ibex alpium ſibiricarum*, Pallas.—*Capra alpina*, &c. Girtanner.—*Stein-bock*, Geſner.—*Bouquetin*, Buffon, Sonnini, &c.—*Ibex goat*, Pennant.

Steinbock is the familiar title, by which this animal is better known than any other. The name is derived from the German *ſtein* and *bock*, or buck of the rock, conveying at once an idea of the animal, and the ſituations in which it delights, and is commonly found. The French name bouquetin is of German origin, and in England the ſpecies is better known by the name of ſteinbock, than that of ibex goat, as it is called by Pennant. In its general appearance it reſembles the common goat, but it is conſiderably larger, more vigorous, and more active. The colour is a deep hoary or greyiſh brown; much paler, or whitiſh beneath, and on the inſides of the limbs; the outſides of which are duſky, or blackiſh on the lower part: the back is marked with a diſtinct black line. The body is robuſt; the head ſhort, ſmall and compreſſed; the eyes are ſmall, but full of fire and expreſſion. The horns in the male are extremely large, meaſuring from two to three feet in length, and weighing eight or ten pounds; they are of a livid blackiſh colour, and are marked on the upper ſurface with tranſverſe protuberant ſemicircles, which it is reported indicate by their number the age of the animal, one additional being formed every year. Theſe horns are thick at the baſe; and ſometimes become ſo prodigiouſly large as to extend the whole length of the body. The female is ſmaller than the male: her horns are ſmaller in proportion, leſs diſtinctly marked with ſemicircular protuberances, and much weaker than thoſe of the male. The legs are ſhort, but the males are very ſtout, and the hoofs ſhort. The tail is ſmall and of a blackiſh colour. The young ſteinbocks are of an aſh-coloured grey.

The ibex is found in ſeveral parts of Europe and Aſia, and it is ſaid on all the great chains of mountains in the northern parts of the ancient hemiſphere, upon the Alps, the Pyrenées, the Apennines, and Tyrol. In Aſia it occurs on the ſummits of the chain of mountains extended from Taurus, and continued between Eaſtern Tartary and Siberia. It alſo inhabits the tract beyond the Lena, and is ſaid by Virey to be a native of the mountains of Kamtſchatka. In Arabia it is not uncommon, and in the high mountains of the iſland of Crete it appears to be abundant.

In its general habits or manners this animal reſembles the common goat, but poſſeſſes every attribute of ſtrength and activity in a degree proportioned to its natural ſtate of wildneſs. It inhabits the moſt inacceſſible places among rocks and precipices in the higheſt regions of the mountains, where it finds all that is neceſſary for its frugal ſubſiſtence in the midſt of ſolitude and ſecurity. Sonnini obſerved them on many of the loftier elevations of the mountains in the iſle of Candia, and ſeveral other iſlands in the ſame ſea, and beyond the upper half of Mount Olympus he found there were hardly any quadrupeds to be ſeen, except a few bears, and the bouquetins, or mountain-goat, capra ibex, who appeared to be ſole maſters of this ſolitary waſte of nature.

The chace of the ſteinbock, like that of the chamois, is both difficult and perilous. When it retreats among the crags and precipices it is impoſſible to purſue the animal in ſafety; the chace is then left to the dogs who are taught to hunt them over the moſt tremendous paſſes of the mountains amidſt ice and ſnow, where many of the dogs are ſometimes loſt in the vain attempt to follow or overcome their game. But ſhould the mountain huntſman once get ſight of the ſteinbock at a diſtance from his dogs and within the range of his rifle piece he inſtantly takes an aim, and ſeldom fails to wound or kill the animal at the firſt fire. It is in this manner they hunt both the ſteinbock and the chamois on the Tyroleſe mountains. The fleſh of the young ibex is ſaid to be in eſteem as an article of food: that of the old ones is alſo eaten, and its fleece and ſkin employed for various purpoſes. We may farther add that this is the animal whoſe blood was formerly conſidered as a valuable article in the materia medica, being celebrated for its ſuppoſed power of relieving pleuritic and many other complaints. Of its wonderful virtues in this way much has been related in the works of Geſner and Aldrovandus. Its period of geſtation is five months as in the common goat.

Capra *Ægagrus.* Horns carinated, and arched back; throat bearded. Pallas. S. G. Gmelin.

*Chevre ſauvage,* Tavernier. *Caucaſan ibex,* Pennant. *Steinbock,* Ridinger.

The caucaſan ibex is conſiderably ſuperior in ſize to the common goat, and its form, in ſome degree, reſembles that of the ſtag. According to Pallas, who deſcribes this animal with accuracy, the general colour of it is greyiſh, intermixed with ruſty, or ferruginous above, and white beneath. The forehead nearly black, which colour is continued in a narrow ſtripe along the middle of the back to the tail. The chin is furniſhed with a large beard of a duſky colour mixed with cheſnut. The horns, which are very large and bend conſiderably backwards, are ſmooth, black, ſharply ridged on their upper part, and hollowed on the exterior ſide; they have no appearance of either knots or rings, but are marked on the upper ſurface by ſome obſcure undulations or ſlight wavy wrinkles: they are about three feet in length, and ſtand cloſe at the baſe, about a foot diſtant at the wideſt part; and eight or nine inches at the tips. The female has either very ſhort horns, or is entirely deſtitute of them, and has no beard.

In point of ſtrength and agility this ſpecies is at leaſt equal, if not ſuperior to the common ſteinbock. Monardes compares it to the he-goat. It inhabits the lower mountains of Caucaſus and Taurus, almoſt all Aſia Minor, and may probably extend even to India. It abounds on the inhoſpitable hills of Laar and Choraſan in Perſia, and according to Monardes, it is likewiſe found in Africa. Mr. Pennant is inclined to believe that it may exiſt in Crete, and even on the Alps, grounding his idea on a figure in one of the works of Ridinger, which ſeems intended for the ſame animal. Monardes aſſures us he was an eye witneſs to the manner in which this animal ſaves itſelf from injury by falling upon its horns from a conſiderable height; for he ſaw the animal he deſcribes leap from a high tower, and precipitating itſelf on its horns, ſpring up again, and leap about without having to all appearance received the ſlighteſt injury. In the ſtomach of this animal, as in ſome of the antelopes, and other quadrupeds, is found the animal concretion, called bezoar, the once highly valued alexipharmic, the pretended medicinal virtues of which have been long ſince exploded.

Capra *Caucaſica.* Horns turned backwards, and outwards, verging inwards at the tips, ſlightly triangular, and knotty before. Gmelin. Güldenſtedt, &c.

This animal, which Pennant includes in his deſcription of the caucaſan ibex (capra ægagrus) as a variety, ought, according to Güldenſtadt, to be conſidered as a diſtinct ſpecies. In ſize it nearly correſponds with the domeſtic goat, but is broader and ſhorter, and the horns of the male are much larger in proportion, being ſometimes more than two feet in length. The horns of the male are darker than in the female. The colour of the animal is a ferruginous or browniſh grey above, with a ſubfuſcous ſpiral line: beneath white: extremities black. The hair is cinereous at the baſe, rigid, and intermixed with wool.

Capra caucaſica inhabits the bare ſchiſtous ſummits and cliffs of Mount Caucaſus near the origin of the Terek and Cuban rivers. They couple in November, the female brings forth her young in April.

Capra *Hircus,* the common, or domeſtic goat. Horns carinated, arched, with a curvature outwards at the extremities.

*Capra Hircus,* β Linn.—*Capra, hircus, hoedus.* Pliny, Aldrovandus, &c. *Caper hiſpanicus,* Jonſt. Τραγοι and Αιγες. Ariſt. &c.—*Bouc et chevre,* Buffon, &c.—*Becco, capra,* Ital. —*Bock et Geyſs,* Germ.—*Domeſtic goat,* Engl.

"The origin of the domeſtic goat (ſays Mr. Pennant in his Britiſh Zoology) is the ſteinboc, ibex, or wild goat, a ſpecies now found only in the Alps, and in Crete." The facts already related in the hiſtory of capra ibex clearly prove the writer to be miſtaken in aſſerting it to be found only in the Alps and in Crete; the obſervation is merely introduced to ſhew that he believes the ibex to be the parent ſtock from which the domeſtic goat originated.

To aſcertain the point in a ſatisfactory manner is perhaps impoſſible: we muſt allow our opinions to fluctuate, between probabilities and poſſibilities without conceiving in our own minds the chance of arriving, with any abſolute ſhare of certainty, at the real truth. Pallas allows that capra ibex may have been the original from which the domeſtic goat is derived, at the ſame time that he is inclined to think with equal probability it may have derived its origin from capra ægagrus, the caucaſan ibex of Pennant. The latter notion ſeems moſt prevalent; Gmelin adops it; and we are led to think on a point ſo ambiguous, not entirely without reaſon.

Buffon conſiders the capra ibex, the chamois antelope, and the domeſtic goat, as one and the ſame ſpecies. He ſpeaks of it as likely that the male ibex coupling with the female chamois may have given riſe to the preſent domeſtic race of goats.—"There are many caſes (ſays this lively writer in another place) in which we cannot diſtinguiſh characters, nor pronounce on differences with certainty: there are others in which we are obliged to ſuſpend our judgment and opinions; and in a great number of others we have not the ſlighteſt ray of light to direct us; for independent of the uncertainty ariſing from the contrariety of aſſertions relative to recorded facts: independent of the doubts reſulting from the inaccuracy of thoſe who have endeavoured to obſerve nature, the greateſt obſtacle to the advancement of knowledge is our ignorance of a great number of effects which time has not diſcloſed to us."—"We are ignorant whether the chamois goat be any thing more than the common goat in a wild ſtate, or whether an intermixture would not form an intermediate race."—The naturaliſts of France, though proud of their immortal Buffon, cannot accede to this inconſiſtent flight of his imagination. Sonnini, the editor of the laſt edition of his works, ſpeaks of it as erroneous. Another French writer is more explicit: "It is abſurd (he thinks) to ſuppoſe with Buffon that our race of domeſtic goats were produced from an intermediate breed between the bouquetin (capra ibex) and the chamois; an inſpection of the exterior characters, and the internal organization of the three animals, to ſay nothing of their manners of life, ſeems to deſtroy all ideas of their being ſpecifically the ſame." That the preſent race of goats cannot be the lineal offspring of the croſs breed between the ibex and the chamois, as Buffon thought, ſeems unqueſtionable; yet we think it pretty certain, from the evidence above adduced, that they may be the deſcendants of capra ibex, or bouquetin, and in that caſe that the diſſimilitude between the internal organization of the capra ibex and that of the common goat cannot be ſo very apparent as our author pretends. This is an intereſting point for the comparative anatomiſt to determine. An account was publiſhed in the French *Journ. de Phyſ.* for October 1786, to prove that the capra ibex ſometimes couples with the domeſtic goat, and produces mongrels. The fact was aſcertained by M. Berthoud van-Berchem who ſaw an inſtance of it in the Valais, where the inhabitants rear numerous herds of tame goats, and the bouquetin is found in a ſtate of nature among the mountains. It was long before well known that the goat will couple with ſheep, the hybrid produce of which differs very little from the natural offſpring of the ewe and ram, except in having a hairy inſtead of woolly fleece. We have yet to learn that an intermixture of the goat and ſheep may be productive of a breed of *fertile mules*, as Buffon ſeems to think very poſſible.

The hiſtory of the common goat has been very amply treated on by many writers, ſo that we can do little more than repeat the obſervations of others in this place.

The goat, in its domeſtic ſtate, is found in almoſt every part of the globe, bearing the extremes of heat and cold, and differing in form according to various circumſtances. It appears to have been originally confined to the old world, from whence it was tranſported to America. P. Browne ſeems to intimate that it is an aborigine of the iſland of Jamaica, but this is improbable: it is believed on very ſufficient authority that it was entirely unknown to the Americans till after the diſcovery of America, when it was introduced by the Europeans.

This animal, obſerves Buffon, is ſuperior to the ſheep both in ſentiment and dexterity. He approaches man ſpontaneouſly, and is eaſily familiarized; he is ſenſible of careſſes, and capable of a conſiderable degree of attachment; he is ſtronger, lighter, more agile, and leſs timid than the ſheep; he is a ſprightly, capricious, wandering, wanton animal. It is with much difficulty that he can be confined, and he loves to retire into ſolitude, and to climb, ſtand, and even ſleep on rugged and lofty eminences; he is robuſt, and eaſily nouriſhed, for he eats almoſt every herb, and is injured by very few; his bodily temperament, which in all animals has a great influence on the natural diſpoſition, is not eſſentially different from that of the ſheep. Theſe two animals, whoſe internal organization is almoſt entirely ſimilar, are nouriſhed, grow, and multiply in the ſame manner; and their diſeaſes are the ſame, excepting a few to which the goat is not ſubject. The goat fears not, like the ſheep, too great degree of heat; he cheerfully expoſes himſelf to the ſun, and ſleeps under its moſt ardent rays without being affected with the vertigo, or any other inconvenience; he is not afraid of rain or ſtorms; but he appears to feel the effects of ſevere cold. The inconſtancy of his diſpoſition is marked by the irregularity of his actions. He walks, ſtops ſhort, runs, leaps, approaches, or retires, ſhews, or conceals himſelf, or flies off as if actuated by mere caprice, and without any other cauſe than that which ariſes from an eccentric vivacity of temper; the ſuppleneſs of his organs, and the ſtrength and nervouſneſs of his frame, are hardly ſufficient to ſupport the petulance and rapidity of his natural movements.

"When paſtured along with ſheep, goats always take the lead of the flock. They love to feed ſeparately on the tops of hills, and prefer the moſt elevated and rugged parts of mountains. They find ſufficient nouriſhment in healthy, barren, and uncultivated grounds. They do infinite miſchief when permitted to go among corn, vines, copſes, or young plantations; for they eat with avidity the tender bark, and young ſhoots of trees, which generally proves fatal to their growth. They carefully avoid moiſt ground, marſhy meadows, and rich paſtures. They are ſeldom reared in plain countries, where they never thrive well, and where their fleſh is always bad.

The male goat is capable of engendering when he is a year old, and the female at ſeven months. But as the fruits of their early coupling are generally weak and defective, they are commonly reſtrained till they be eighteen months, or two years old. The he-goat is handſome, vigorous, and ardent, and one is ſufficient to accompany an hundred and fifty females for the ſpace of two or three months; but his ardour, which ſoon conſumes him, does not laſt more than three or four years, and by the age of five or ſix, he becomes nearly enervated. In the ſelection of a he-goat for propagation, attention ſhould be paid to his ſtrength and age; he ſhould be large, and about two years old; his neck ſhort and fleſhy; his head ſlender; his ears pendulous; his thighs thick; his limbs firm; his hair black, thick, and ſoft; and his beard long and buſhy. The choice of the female is of leſs conſequence, obſerving only, that thoſe with large bodies, thick thighs, who walk light, have large udders, and ſoft buſhy hair, are the moſt preferable. They are in ſeaſon from September to the end of November, though they will couple and produce young at all times. The ſmell of the goat is highly unpleaſant, that of the male eſpecially. During the months of September and October, the whole atmoſphere around them is filled with their ſtrong diſagreeable odour, and which, though as diſguſting as aſafœtida itſelf, in the idea of ſome naturaliſts, may perhaps be conducive to the prevention of many diſtempers, and to cure thoſe of a nervous and hyſterical kind. Horſes are ſuppoſed to be much refreſhed with it, on which account, many people keep he-goats in their ſtuds or ſtables.

The female produces one kid, ſometimes two, very rarely three, and never more than four: ſhe carries her young five months, bringing them forth about April; and is in condition to breed from the age of ſeven months till ſhe is ſeven years old. The he-goat, as before ſaid, will propagate as long, if proper care be taken of him, but otherwiſe becomes uſeleſs two or three years ſooner. He is then ſent to fatten among the common herd. The ſtrong ſmell of the goat does not proceed, it is ſaid, from his fleſh, but his ſkin. Theſe animals are ſeldom permitted to grow old, or perhaps they might live eleven or twelve years; but it is uſual to fatten and kill them as ſoon as they ceaſe to multiply, becauſe the older they are the worſe is their fleſh. The goats are animals that coſt very little for their food, and in cold, mountainous countries are attended with conſiderable advantage: their fleſh, tallow, hair, and ſkin, are all valuable commodities. Their milk is ſaid to be more wholeſome and better than that of the ſheep; it is uſed in medicine, curdles eaſily, and makes very good cheeſe. The females, ſays Buffon, will allow themſelves to be ſucked by infants, to whom their milk affords very excellent nouriſhment. "Like cows and ſheep, (continues this writer) they are ſucked by the viper, and alſo by the bird called in France l'engoulevent, (the goat-ſucker,) which faſtens to their teats during the night, and, as ſome ſay, makes them loſe their milk for ever after." It may be almoſt ſuperfluous to point out the abſurdity of this whimſical idea, founded, as we muſt believe, on the groſſeſt prejudices of ruſtic ignorance; this notion is certainly entertained among the lower claſs of peaſantry, both in our own country and in France. It is a matter of ſurpriſe to many, that Sonnini in his edition of Buffon's works, has not endeavoured to correct this error, or explain it to our ſatisfaction. The readineſs with which the female goat will allow herſelf to be ſucked by other animals, is indeed well known. Of this, Sonnini has given a very ſtriking inſtance; he aſſures us that in the year 1780, he ſaw a foal which had loſt its mother, nouriſhed by a goat, which during the proceſs, was placed on a barrel, in order that that the foal might ſuck with the greater convenience. The foal followed its nurſe to paſture, as it would its parent, and was attended with the greateſt care by the goat, which always called it back by her bleatings when it wandered to any diſtance from her.

The colour of the goat is various, being either black, brown, white, or ſpotted. Thoſe of Wales Mr. Pennant thinks far ſuperior in ſize, ſtrength, and fineneſs of the hair, to thoſe of other mountainous countries; the goats of France, and the Alps, being generally ſhort-haired, reddiſh, and ſmall-horned; while the horns of the Cambrian he-goat have been ſeen three feet two inches long, and branching three feet aſunder between the tips. "The ſuet of the goat is in great eſteem, as well as the hair. Many of the inhabitants of Caernarvonſhire ſuffer theſe animals to run wild on the rocks during winter as well as ſummer; and kill them in October, for the ſake of their fat, either by ſhooting them with bullets, or running them down with dogs, like deer. The goats killed for this purpoſe are about four or five years old. Their ſuet will make candles, far ſuperior in whiteneſs and goodneſs to thoſe made from that of the ſheep or the ox, and accordingly brings a much greater price in the market: nor are the horns without their uſe; the country people making of them excellent handles for tucks, and penknives. The ſkin is peculiarly well adapted for the glove manufactory, eſpecially that of the kid: abroad it is dreſſed and made into ſtockings, bed-ticks, bolſters, bed hangings, ſheets, and even ſhirts. In the army it carries the foot-ſoldier's proviſions. As it takes a dye better than any other ſkin, it was formerly much uſed for hangings in the houſes of people of fortune, being ſuſceptible of the richeſt colours; and when flowered and ornamented with gold and ſilver, became an elegant and ſuperb furniture." "The fleſh is of great uſe to the inhabitants of the country where it reſides, and affords them a cheap and plentiful proviſion in the winter months, when the kids are brought to market. The haunches of the goat are frequently ſalted and dried, and ſupply all the uſes of bacon: this by the natives is called *coch yr wden*, or hung veniſon."—"The meat of a ſplayed goat of ſix or ſeven years old (which is called *hyfr*,) is reckoned the beſt; being generally very ſweet and fat. This makes an excellent paſty; goes under the name of rock veniſon, and is little inferior to that of the deer. Thus nature provides even on the tops of high craggy mountains, not only neceſſaries, but delicacies for the inhabitants." Penn. Brit. Zool.

The above paſſages are ſelected from Pennant's deſcription of the Cambrian goats, as they contain much uſeful information. It ſhould, however, be mentioned, that thoſe obſervations were written above thirty years ago, and are not in every particular applicable to the preſent ſtate of things in Wales, where Engliſh manners, and Engliſh huſbandry are making rapid innovations. The goat is an animal, we may ſtrictly ſay from our own very recent obſervations, but ſparingly cultivated at this time in the principality. The culture of this uſeful animal has been on the decline for the laſt twenty years, and is now almoſt wholly confined to the mountainous parts of Caernarvonſhire: a ſmall breed of ſheep that thrive admirably well on the mountains, where goats were formerly kept, have ſuperſeded them: the rearing of cattle, and eſpecially ſheep, is conſidered more beneficial and reſpectable by the modern Welſh farmer. We have obſerved goats in greater numbers among the tremendous cliffs that overlook the paſs of Pont-Aberglaſslyn, than in any other parts of North Wales. In South Wales the goat is ſeldom ſeen.

The ſkin of the goat is readily converted into parchment, and it is alſo frequently uſed by the leather dreſſers for making what is termed Morocco leather: the beſt ſkins for this purpoſe are thoſe of the Corſican breed of goats. The manufacturer, we alſo learn, can imitate the chamois leather ſo exactly with the ſkin of the goat, that the difference is ſcarcely to be diſcerned.

Capra *Angorenſis*, γ. Body covered with very long, pendent, ſpirally curled hair.

*Capra Angorenſis*, Haſſelq.—*Chevre d'Angora*, Buffon, &c.—*Angora goat*, Pennant, &c.

The Angora goat is in general of a beautiful milk-white colour, with ſhort legs, and black ſpreading ſpirally twiſted horns. The hair on the whole body is diſpoſed in long pendent ſpiral ringlets; its ears are pendulous, and the horns of the female, inſtead of divaricating, as in the male, turn backwards, and are much ſhorter in proportion.

In its native country this animal is highly valued, and with ſufficient reaſon, for it is a ſource of riches to its cultivators; the fineſt, and moſt coſtly robes of the higheſt claſſes in Turkey being fabricated of its ſilky fleece: the price it bears is very great. Moſt of the European nations have agents for purchaſing the valuable wool of this animal, which the Turks, it is reported, will not allow to be ſent out of their empire in a raw ſtate, but in the form of thread; a multitude of the poorer orders obtaining a livelihood by ſpinning it. The moſt conſiderable manufactory of camlets, fabricated with this wool in Europe, appears to be thoſe of Liſle and Amiens, in France. In order to preſerve this beautiful hair in good condition, the goat herds of Angora are peculiarly careful of their flocks, waſhing and combing them with the greateſt diligence; and it is ſaid that a change of paſture frequently makes them loſe their beauty; this variety being naturally confined to narrow bounds, and produced only in the tract ſurrounding the towns of Angora and Beibazar, two places ſituated in a ſmall diſtrict of Aſia Minor, not far from Smyrna, and remarkable for producing a peculiar race of ſheep, cats, and rabbits, as well as goats, with hair of uncommon length and fineneſs.

Capra *Mambrica*, δ. Horns reclining; ears pendulous; chin bearded.

*Capra Mambrica*, Linn.—*Capra Syriaca*, Briſſ.—*Geyſſen mit hangenden Ohren*, Rauwolf.—*Chèvre Mambrine*, ou *chèvre du Levant*, Buff.—*Syrian goat*, Penn.

This variety of goat takes its name of Mambrica from a particular mountain, called Mambre, or Mambra, ſituated in the middle part of Paleſtine, near the river Hebron, where they abound. The variety is common in many parts of the Eaſt, and is principally diſtinguiſhed by the great length of the ears, which are pendulous, and ſometimes reach ſo low as to incommode the animal while feeding. It is reported by travellers, that the owners of theſe animals, on ſuch occaſions, cut off one of their ears that they may feed with greater eaſe. This, however, is denied by Sonnini and other French writers, who aſſure us that the ears of this goat never reach ſo low as the ground, and are never cut off. Its general colour is reddiſh, with ſhort blackiſh horns. This is the common goat of Aleppo, the inhabitants of which it ſupplies with milk. The ſame is the caſe at Cairo, where theſe goats are driven in ſmall flocks every morning through the different quarters of the city, and every one ſees taken from them the quantity of milk they want.

Capra *Depreſſa*, ε. Horns ſmall, depreſſed, and cloſely incumbent to the ſkull.

*Capra depreſſa*, Linn.—*Capra parva Americana*, &c. Briſſ.—*Bouc d'Afrique*, Buff. &c.—*African goat*, Penn.

This is a ſmall variety, or dwarf kind of goat, found in ſome parts of Africa. The French call the male bouc d'Afrique, and the female, la chèvre naine. This kind has rough hair, and extremely ſhort horns, which are very thick, triangular, and lie cloſe to the head; in the female they are ſtill ſhorter. Dr. Shaw obſerves, that Linnæus ſeems to have entertained an erroneous idea relative to the native country of this variety, and to have ſuppoſed it an American animal. We may add, that although the animal was originally a native of Africa, it has been long ſince tranſported to America, where it thrives well, and ſeems to have undergone no other alteration from the effect of its new climate, than in becoming ſomewhat more diminutive in ſize.

Capra *Reverſa*, ζ. Horns erect, and recurved at the tips. Linn.

*Ibex parvus Americanus*, Briſſ.—*Bouc de Juda*, *Chèvre de Juda*, Buff.—*Whidaw goat*, Penn.

Herds of this ſpecies of goat are cultivated in moſt parts of Upper Egypt. This is a dwarf variety, found in various parts of Africa. It is ſaid to be alſo very common in Guinea and Angola. The fleſh is conſidered as an excellent food.

There is a variety of this kind with longer horns; the hair is long and ſilky, and the whole animal bears ſome reſemblance to a ſmall Angora goat. Buffon deſcribes it as being conſiderably larger than the other, meaſuring two feet nine inches in length; while the other was only twenty-four inches long. Buff. Suppl. pl. 13.

Capra *Capricornus*, η. Horns ſhort, turned forwards at the tips, and annulated at the ſides.

*La capricorne*, Buff.—*Capricorn goat*, Penn.—*Capricorn goat*.

A variety deſcribed by Buffon from a ſkeleton with the horns, preſerved in the king's cabinet at Paris. The animal is ſuppoſed to be a native of Africa. In the form and proportion of the bones, Buffon tells us it bears a perfect reſemblance to the domeſtic he-goat; and the figure of the under jaw is the ſame as that of the wild goat; but that it differs from both in the horns; thoſe of the wild goat having prominent tubercles or knobs, and two longitudinal ridges, between which there is a well marked anterior face: thoſe of the common goat have but one ridge, and no tubercles. The horns of the capricon have but one ridge, and no anterior face; and though they want the tubercles, they have rugoſities, which are larger than thoſe of the male domeſtic goat. Theſe differences, adds Buffon, ſeem to indicate an intermediate race between the wild and domeſtic goat; and, beſides, the horns of the capricorn are ſhort and crooked at the point, like thoſe of the chamois; and at the ſame time are compreſſed and ringed; and hence, they ſeem to partake at once of the he-goat, the wild goat, and the chamois. This variety appears to be ſcarcely known, except from the deſcription of it given us by Buffon.

CAPRA-COTTA, in *Geography*, an inconſiderable town of Naples, in the county of Moliſe, ſeated on an eminence; 13 miles N.W. of Moliſe.

Capra *Saltans*, or Capræ *Saltantes*, in *Meteorology*, a fiery meteor, or exhalation, which ſometimes appears in the atmoſphere, and is not fired in a ſtraight line, but with inflexions, and windings in and out, reſembling the caperings of a goat. The capræ ſaltantes are not ſo called from their figure, which is various, ſometimes round, ſometimes long, but, from their moving by jerks, ſomewhat like the leaps of that animal; and from the little languets of fire which hang at, and ſometimes fall from them, which antiquity has been pleaſed to fancy like the beard or locks of a goat's hair. Ariſtotle diſtinguiſhes the capra from the trabs, in that the latter proceeds with an uniform motion, the former with an irregular one, and as it were by jumps. Ariſt. Met. lib. i. cap. 5. Mem. Ac. Inſer. tom. vi. p. 95.

The capræ ſeem to be very low, yet ſometimes fly ſo high, that meteorologiſts have placed them in the upper region, though not ſo conſtantly, but they are ſometimes alſo found in the middle region. Of globular capræ we have divers inſtances, in ancient as well as modern naturaliſts. Such was the flame ſaid by Seneca to have been ſeen in form of a huge ball, about the bigneſs of the moon, when Paulus Æmilius waged war againſt Perſeus. Such another, he tells us, was ſeen at the death of Auguſtus; another on the tragedy of Sejanus; another at the death of Germanicus. Such was that ſeen about Michaelmas, 1676, by no leſs than twelve counties at once; it is deſcribed by Mr. Naſh, as it appeared near Seighford in Staffordſhire, as of a globular figure moving by jerks, and making ſhort reſts at every one of them, letting fall drops of fire, which were parts of its body; for it decreaſed in magnitude the farther it went, and the oftener it dropped, till at length it wholly diſappeared. Senec. Nat. Quæſt. lib. i. cap. 1. Phil. Tranſ. N° 135. p. 865, ſeq. Plott. Nat. Hiſt. Stafford. cap. i. § 40.

Capra *Trituratoria*, in *Ancient Huſbandry*, was a kind of iron log, made in the figure of a goat, which was laid on the *tribula*, to make it more effectual in ſeparating the corn from the ears, the ancient way of threſhing.

CAPRAJA, in *Geography*, an iſland of the Mediterranean, ſituate between the coaſt of Italy and the northern part of the iſland of Corſica, about 6 leagues in circumference. This iſland is populous, though the ſoil is dry and mountainous. It is ſurrounded with rocks, except in one part, where is a good harbour, belonging to a town named Capraja. N. lat. 4[illegible]. E. long. [illegible] 5'.

CAPRARIA, in *Botany*, goat-weed, (from *caper*, a *goat*, ſo called becauſe goats are fond of the biflora, the beſt known ſpecies). Linn. Gen. 768. Schreb. 1030. Willd. 1169. Gært. 309. Juſſ. 118. Vent. ii. 557. Claſs and Order, *didynamia angioſpermia*. Nat. Ord. *Perſonatæ*, Linn. Vent. *Scrophulariæ*, Juſſ.

Gen Ch. *Cal.* one-leafed, five-cleft, oblong; ſegments linear, erect, diſtant, permanent, ſhorter than the corolla. *Cor.* monopetalous, bell-ſhaped, five-cleft, nearly equal; ſegments oblong, acute; the two upper ones more erect. *Stam.* filaments four, awl-ſhaped, inſerted into the baſe of the corolla, and only the half of its length; the two lower ones rather ſhorter than the others; anthers heart-ſhaped. *Piſt.* germ conical; ſtyle thread-ſhaped, longer than the ſtamens; ſtigma heart-ſhaped, (bilamellate, Gært. two-lobed, Juſſ.) two-valved, equal. *Capſ.* oblong-conical, compreſſed at the tip, two-celled, two-valved; valves, when mature, bifid; partition doubled by the bending of the edges of the valves. *Seeds* numerous, roundiſh; receptacle adhering to the axis of the capſule, not to the partition; when mature, diſunited.

Eſſ. Ch. *Calyx* five-cleft. *Corolla* bell-ſhaped, five-cleft, acute. *Capſule* two celled, two-valved, many-ſeeded.

Sp. 1. C. *biflora*, Linn. Sp. Pl. 1. Willd. 1. Mart. 1. Lam. Enc. 1. Gært. tab. 53. *fig.* 9. Lam. Ill. Plant. 534. *fig.* 2. "Leaves alternate; flowers in pairs." A ſhrub, three or four feet high. *Branches* long, erect, commonly ſmooth. *Leaves* about an inch and half long, but in the ſhade near five, alternate, ſeſſile, oval-oblong, ſerrated in their upper half, ſmooth; on ſandy coaſts ſucculent, thick, and brittle. *Flowers* white, ſcentleſs, axillary, generally two together, ſometimes three; peduncles ſimple, ſhorter than the leaves; calyx ſmooth, deeply five-cleft; ſegments of the corolla hairy at the baſe; anthers double; germ egg-ſhaped, furrowed; ſtigma headed, acute. *Capſule* furrowed on both ſides, the length of the calyx. *Seeds* very ſmall. A native of the Weſt Indian iſlands, and the neighbouring continent, and one of the plants which the natives of the country uſe for tea. The capraria peruviana of Feuillé, (Per. i. p. 764. tab. 48.) which Linnæus conjectured to be this ſpecies, is a different plant, for which a diſtinct genus has been formed by Ruiz and Pavon, in their Flora Peruvienſis; but it differs from capraria only in having

five ſtamens. See Xuaresia. 2. C. *cruſtacea*, Linn. Mant. p. 87. Mart. 3. (Caranas, Rumph. Amb. v. p. 491. tab. 170. *fig.* 3. *β*. Capraria uniflora. Burm. Fl. Ind. p. 133. tab. 14. *fig.* 3.) "Leaves oppoſite, egg-ſhaped, ſcolloped, on very ſhort petioles." *Stems* herbaceous, much-branched, four or five inches high. *Leaves* oppoſite, rather acute. *Flowers* axillary and terminal; peduncles ſimple, longer than the leaves. Linnæus ſays that it reſembles his *capparis gratioloides*, but that the leaves are more egg-ſhaped and petioled. Willdenow has omitted it. 3. C. *lucida*, Willd. 2. Mart. 6. Hort. Kew. ii. p. 353. "Leaves oppoſite, oblong, acute, ſharply and minutely ſerrated, even; petioles winged; peduncles three-flowered." Whole plant ſmooth. *Stems* quadrangular, biennial. *Leaves* an inch and half long; petioles half an inch. *Flowers* axillary, a little longer than the petioles; exterior pedicels ſometimes three-flowered; bractes awl-ſhaped, the length of the pedicels; ſegments of the calyx awl-ſhaped, three lines in length; corolla ſalver-ſhaped; tube cylindrical, pale purple, a little longer than the calyx, gibbous on the outſide at the baſe, a little bent above, then erect, a little elongated on the outſide; border horizontal; ſegments egg-ſhaped, obtuſe, equal, reddiſh purple, with a dark purple ſpot near the throat; throat hairy; anthers oblong, compreſſed; germ roundiſh; ſtyle ſhorter than the ſtamens; ſtigma large, convex, oblique. Hort. Kew. Willdenow obſerves that the fruit is a two-celled berry, as it probably is in all the Cape ſpecies, ſince they agree with it in the habit of the flower; and that, therefore, they may not improperly form a diſtinct genus. A native of the Cape of Good Hope: obſerved by Maſſon. Introduced at Kew, in 1774. It flowers in April and May. 4. C. *lanceolata*, Linn. jun. Supp. 284. Willd. 3. Mart. 4. Hort. Kew. ii. p. 354. "Leaves oppoſite, lanceolate, entire; racemes compound, terminal." *Stem* ſhrubby. *Leaves* two inches long and more, acute, ſtiff. *Flowers* in a terminal panicle, compoſed of ſhort racemes. Found at the Cape of Good Hope by Thunberg and Maſſon. Introduced in 1774. 5. C. *ſemiſerrata*, Willd. 4. Vahl. Eclog. ii. p. 47*. "Leaves lanceolate, ſerrated outwards; peduncles ſometimes many-flowered." *Stem* herbaceous, erect, round below, angular above, interſperſed with ſhort hairs. *Leaves* two or three inches long, alternate, thick-ſet, ſpreading, narrowing at the baſe into the petiole, acute, ſmooth on both ſides, ſerrated from the tip to the middle, then entire. *Flowers* axillary, and terminal; peduncles ſcarcely half an inch long, pubeſcent, from one to four-flowered; pedicels alternate, approximate, very ſhort; bracte one at the baſe of each pedicel, linear-lanceolate, a little longer than the pedicel; ſegments of the calyx awl-ſhaped; corolla longer than the calyx, hairy at the bottom; ſegments five, linear-oblong; ſtigma capitate. *Capſule* oblong, a little longer than the calyx, two-furrowed, two-valved, ſplitting into two. *Seeds* numerous, very ſmall, affixed to a linear, looſe receptacle. Vahl. A native of St. Martha, in America. 6. C. *undulata*, Linn. jun. Supp. 284. Willd. 5. Mart. 5. Hort. Kew. ii. p. 354. L'Herit. Sert. Ang. p. 21. "Leaves oppoſite, oblong-egg-ſhaped, entire, waved; upper ones ſomewhat heart-ſhaped, in whorls; racemes reſembling ſpikes." *Stem* ſhrubby. Found at the Cape of Good Hope by Thunberg and Maſſon. Introduced in 1774. 7. C. *humilis*, Willd. 6. Mart. 7. Hort. Kew. ii. p. 354. "Pubeſcent; leaves oppoſite, or in threes, egg-ſhaped, ſerrated, petioled; peduncles axillary, ſhorter than the petiole." *Root* annual. Found in the Eaſt Indies by Dr. I. G. Koenig. Introduced in 1781, by ſir Joſeph Banks.

*Propagation and Culture.* The firſt ſpecies is propagated by ſeeds, which muſt be ſown upon a hot-bed in the ſpring, and to bring them forward ſhould be afterwards planted upon another hot bed. About the middle or end of June they may be tranſplanted either into pots of rich earth, or into a warm border, where they will ripen their ſeeds in autumn in the open air. The Cape ſpecies may be increaſed by cuttings, and are leſs tender. Martyn's Miller.

Capraria *Gratioloides*, (Linn.) See Lindernia *pyxidaria*.

Capraria *Durantifolia*, (Linn.) See Stemodia *durantifolia*.

Capraria. (Linn. Hort. Cliff.) See Scoparia *dulcis*.

Capraria. (Gron. Virg.) See Lechea *minor*.

Capraria, in *Geography*, one of the Treniiti iſlands, in the Adriatic, about 4 leagues from the coaſt of Italy; very ſmall, and uninhabited. N. lat. 42° 10′. E. long. 15° 36′.

CAPRARIENSES, in *Ancient Geography*, an appellation given to mountains of Africa, in Mauritania, which were inacceſſible, and alſo to the inhabitants of theſe mountains.

CAPRASIA, a town of Italy, in Brutium.—Alſo, the name given by Pliny to one of the mouths of the river Eridanus, or the Po.

CAPRATA, in *Ornithology*, a ſpecies of Motacilla, of a black colour, with the rump, vent, and ſpot on the wing-coverts white.

Inhabits the iſland Luzonia. Length four inches and a half. Bill black; legs black-brown. Called by Briſſon *rubetra lucionenſis*, *traquet d'iſle de Luçon*, Buffon, and *Luzonian warbler*, Latham.

CAPREA, in *Zoology*. See Capriolus and Cervus.

CAPREÆ, in *Ancient Geography*. See Capri.

Capreæ, in *Entomology*, a ſpecies of Phalæna, (Noctua). The wings flexuoſe, cinereous, with three oblique whitiſh ſtreaks, and two ſtigmata. Inhabits Germany. Larva naked, green, and feeds on the willow.

Capreæ, that ſpecies of Aphis, that infeſts *ſalix caprea*.

This is ſmall, of a greeniſh colour, with pointed abdomen; and the eyes, antennæ, and tips of the legs black. Fabr. &c.

CAPREOLATE *Plants*, in *Botany*. See Capreolus.

CAPREOLI, in the *Ancient Architecture*, a ſort of rafters or timbers ſerving to ſuſtain the *canterii*, either in buildings, or machines. They were thus called, not, as Philander imagines, from their reſemblance to the *capreoli*, or tendrils of vines, but from the affinity of their form and office to wild goats; as theſe butt and repel things with their horns, ſo do the former oppoſe their heads or horns to the weight of the *canterii*.

CAPREOLUS, in *Botany*, a term uſed by the old botaniſts for a tendril, or claſper, called by Linnæus *cirrhus*.

Capreolus, in the *Ancient Huſbandry*, a kind of iron hoe or inſtrument with two forks or fangs, wherewith to ſtir and move the ground.

Capreolus, in *Zoology*, a ſpecies of Cervus, the roe of Engliſh writers. See Cervus.

CAPRI, in *Geography*, anciently Capreæ, an iſland of the Mediterranean, about three Italian miles from the coaſt of Naples, about eight miles in circumference. Although it is ſo mountainous that its coaſts are almoſt inacceſſible, ſome parts of it are very fertile; and it abounds ſo much with various birds of paſſage, and more eſpecially with quails, that the greateſt part of the biſhop's income ariſes from the taking of theſe and the hunting of other game. Hence this iſland has been called the "biſhopric of quails." Swinburne, (Travels, vol. iii. p. 7.) informs us, that even in bad years the number of quails caught in this iſland amounts to 12,000; and that in good years it exceeds 60,000. On the eaſtern ſummit of Capri are cliffs of ſtupendous altitude that overhang the channel, which ſeparates this iſland from Cape Campanella, anciently called "promontorium Athenæum, or Minervæ." The iſland of Capri or Capræ is famous in hiſtory as a place often viſited by the emperor Auguſtus both for health and recreation; and as the retreat of Tiberius, A. D. 27, who here abandoned himſelf to indolence, intemperance, and the moſt infamous debauchery. In this retired abode he ſpent a great part of ten years, ſecluded from the world, and wallowing in brutal debaucheries, the detail of which has been tranſmitted to us by many authors of unqueſtionable credit, although ſome of the practices which they recite ſeem to be incompatible with his advanced age and complicated infirmities: however, the obſcene ſculptures and medals, which have been dug up in almoſt every corner of the iſland, ſufficiently prove that the charge againſt him is well founded. On the ſcite of his ſummer palace now ſtands the hermitage of Santa Maria, commanding a moſt enchanting proſpect. Tiberius, in order to vary his pleaſures, and to enjoy the advantages as well as avoid the inconveniences of each revolving ſeaſon, built twelve villas in different ſituations, dedicated to the twelve greater gods, of ſome of which the ruins are ſtill to be ſeen. At Santa Maria are extenſive vaults and reſervoirs, and on an adjoining brow are the remains of a light-houſe; two broken columns indicate the entrance of the principal court. At the palace of La Marina, Tiberius had a winter reſidence; where columns and other fragments of architecture ſcattered on the ſands remain as memorials of its ſplendour. A ſemicircular receſs of net-work, the "opus reticulatum" of Vitruvius, raiſed againſt the cliff, ſeems to have been a part of the theatre; and the conduit that ſupplied the palace with water ſtill exiſts. The ruins ſtretch far into the ſea, which has now reſumed the territory from which it had formerly been expelled by terraces and piers. Here the ſoil is richly vegetative, and compoſed of divers layers; a deep ſtratum of good mould covers a yellow bole, under which lies a ſtone exactly ſimilar to the tufa of the volcanic hills round Naples. The palace was built with this ſtone, but in the abutments and back walls are inſerted large pieces of lava in a rough ſtate of torrefaction, like that of the cruſt of Veſuvian ſtreams when cooled; yet the upper rocks of Capri are univerſally calcareous, and homogeneal with the ſtrata of the Sorrentine mountains, of which they appear to have been a part till ſplit aſunder, and caſt off by an earthquake that buried the intermediate grounds in the ſea. Theſe lower tracts in Capri have probably been thrown up by fire in the midſt of lime-ſtone mountains, in the ſame manner as the plain of Sorrento. According to Dion Caſſius, this iſland was wild and barren before the Cæſars took it under their protection; at this day a large portion of its ſurface is uncultivated and impracticable; but every ſpot that will admit the hoe is induſtriouſly tilled, and richly laden with the choiceſt productions of agriculture. The odium attached to the memory of Tiberius proved fatal to his favourite abode. Scarcely was his death proclaimed at Rome, ere the ſenate iſſued orders for the demolition of every fabrick he had raiſed on the iſland, which, by way of puniſhment, was thenceforward deſtined to be a ſtate-priſon. The wife and ſiſter of Commodus were baniſhed to its inhoſpitable rocks, which were ſoon ſtained with their blood. In the middle ages Capri became an appendage of the Amalfitan republic, and, after the downfal of that ſtate, belonged to the duchy of Naples. About a ſtone's throw from the ſouth ſide of this iſland are two or three pointed rocks, the "Scopuli Sirenum," mentioned by Virgil and Ovid in their deſcription of Æneas's voyage.

"This iſle," ſays Swinburne, "reunites ſuch a variety of beauties and advantages, that it is a matter of wonder to me, why ſo few of our miſanthropic countrymen reſort to it; a man of an indolent philoſophic caſt would here be ſuited with a ſcene for meditation and ſolitary enjoyment; the temperature of the air and the excellence of the fruits would ſecure his health; and the delightful ſcenery round him would diſpel his cares, and given an even cheerful flow to his ſpirits."

Capri, a town of the iſland above deſcribed, ſeated in a narrow, low, but delightful and fertile ſpot of land, between two rugged eminences, which form the extremities of the iſland, and appearing at a diſtance by its cupolas and buildings to be a conſiderable place, but on a nearer approach dwindling to a village. It is the ſee of a biſhop, ſuffragan of Amalfi. It is 17 miles S. of Naples. N. lat. 30° 34′. E. long. 13° 58′.

Capri *Portus*, in *Ancient Geography*, a port of Macedonia, which, according to Mela, lay between mount Athos and the river Strymon.

CAPRIANUS *Mons*, a mountain of Sicily, in the vicinity of the town of Heraclea.

CAPRIATA, Pier-Giovanno, in *Biography*, an hiſtorian of Genoa, who flouriſhed in the 17th century. His Italian hiſtory comprehends the tranſactions that occurred in Italy during his own time, which he has related with clearneſs, and with ſagacity traced to their cauſes; maintaining at the ſame time, as he ſays, a perfect impartiality between the powers of France and Spain, that were concerned in them. The two firſt parts of this hiſtory were publiſhed by Capriata in his life-time, from 1613 to 1644; and the third part, extending to 1660, was publiſhed by his ſon after his death. The whole has been tranſlated into Engliſh. Gen. Dict.

CAPRICCIO, *Ital.* a muſical term for a wild, irregular movement, but full of fire and fancy. It is generally intended to diſplay execution in the performance of new and ſingular paſſages, with the freedom of an extemporaneous flight. During the laſt century, the capriccj of Vivaldi, Veracini, and Locatelli, were in high favour.

Caprice is applied, in *Architecture*, to an edifice of a ſingular taſte, and deviating much from the common rules of building.

CAPRICERVA, in *Zoology*, one of the ſynonyms of *antilope cervicapra*; which ſee.

CAPRICKE, in *Geography*, a town of France, in the department of Eſcaut, and chief place of a canton, in the diſtrict of L'Ecluſe. The place contains 3239, and the canton 14,049 inhabitants. The territory comprehends 125 kiliometres and 8 communes.

CAPRICORN, the *Goat*, in *Aſtronomy*, a ſouthern conſtellation and the tenth ſign of the zodiac, from which alſo the tenth part of the ecliptic takes the ſame denomination. This was one of the 48 conſtellations received from the Egyptians by the Greeks.

The character whereby Capricorn is repreſented in aſtronomical writing, is ♑, or ♑, of which the other is an imitation. The former is a kind of reſemblance of the crooked horns of the goat, and the latter of the animal itſelf.

As to the figure of this conſtellation, the Greeks pretend that Pan, in order to avoid the terrible giant Typhon, threw himſelf into the Nile, and was changed into this figure; and that, in commemoration of this exploit, Jupiter took it up into heaven. But it is more probable, as Macrobius obſerves, that the Egyptians marked the portion of the heavens appropriated to this ſign, where the ſun begins to aſcend towards the north, with the figure of a goat, which is an animal that delights in climbing the ſides of mountains.

The ancients accounted Capricorn the tenth ſign, and when the ſun arrived thereat, it made the winter ſolſtice, with regard to our hemiſphere; but the ſtars having advanced a whole ſign towards the eaſt, Capricorn is now rather the eleventh ſign; and it is at the ſun's entry into Sagittary, that the ſolſtice happens: though the ancient manner of ſpeaking is ſtill retained.

The ſtars in the conſtellation of Capricorn, in Ptolemy's and Tycho's Catalogue, are 28; in that of Hevelius 29; though it is to be obſerved, one of thoſe in the tail, of the ſixth magnitude, marked in Tycho's book the twenty-ſeventh, was loſt in Hevelius's time. Mr. Flamſteed, in the Britannic Catalogue, enumerates 51 ſtars in this ſign.

It is repreſented on ancient monuments, medals, &c. as having the fore-part of a goat, and the hind-part of a fiſh; which is the form of an ægipan; and ſometimes, ſimply, under the form of a goat.

For Dr. Herſchel's account of the luſtre and magnitude of the ſtars in Capricorn, ſee Phil. Tranſ. vol. lxxxvi. p. 199. 217. vol. lxxxvii. p. 299.

CAPRICORN, *tropic of*, a leſſer circle of the ſphere, parallel to the equator; paſſing through the beginning of Capricorn, and determining the winter ſolſtice, or the point of the ſun's greateſt ſouth declination. See TROPIC.

CAPRICORN *beetle*, in *Entomology*, the trivial Engliſh name of *Cerambyx longimanus*, which ſee.

CAPRICORN-*goat*, in *Zoology*. See CAPRA *Capricornus*.

CAPRICORNE, the name given by Buffon, and other French writers, to *Capra capricornus*, which ſee.

CAPRICORNUS, a variety of the goat, *Capra ægagrus*, with ſhort horns, that turn forward at the apex, and are annulated at the ſides. See CAPRA.

CAPRICORNUS *exiguus ſaltatorius* of Ray, is the Fabrician inſect *Chryſomela hyoſcyami*. Mordella ovata cærulea nitida, tibiis ferrugineis. Linn. Faun. Suec. 540.

CAPRICORNUS *niger cornutus*, Muſ. Petrop. 652, is *Cerambyx batus* of Linnæus.

CAPRICORNUS *ruſticus* of Petiver, the inſect called by modern entomologiſts *Cerambyx ædilis*.

CAPRIFICATION, a name given in the iſlands of the Archipelago to a peculiar method of propagating and ripening the fruits of the domeſtic fig-trees, by means of inſects. Plin. Hiſt. Nat. lib. xv. cap. 19.

M. Tournefort aſſures us, that this method is ſtill practiſed every year in moſt of the Grecian iſlands; and he admired the patience of thoſe who ſpent above two months in carrying the flies from one fig-tree to another. Caprification is formed from *caprificus*, the wild fig tree, from whoſe fruits the inſects are produced, which are the chief inſtruments of caprification. This tree bears three different ſpecies of fruit, called *fornites*, *cratirites*, and *orni*, which anſwer no other purpoſe but that of facilitating the above operation. The *fornites* appear in Auguſt, and contain little worms, hatched from eggs depoſited by flies; in October and November, theſe worms become flies, which pierce the ſecond figs called *cratirites*, which do not appear till the end of September: theſe figs continue to the month of May following, and furniſh a lodgment for the eggs of the ſecond claſs of flies. In May, the third ſpecies of figs, called *orni*, appear; and when they are grown to a certain ſize and begin to open at the eye, they are pierced by the flies produced by the *cratirites*, or winter-figs. When the worms bred in theſe ſpring figs are transformed into flies, which happens in the months of May or July, the peaſants gather them, and tranſport them to the garden fig-trees. The ſucceſs of the caprification depends on this circumſtance, and therefore they viſit their wild fig-trees and their garden fig-trees every morning, to examine the eye of the fig; by which they judge when the flies are about to iſſue from the wild figs, and when they may be applied ſo as to pierce the garden figs. They are then depoſited on ſuch trees as are fit to receive them, and enter the fruit by the eye, where they lay eggs, the worms of which cauſe the garden-figs to attain their proper degree of bigneſs and maturity. The conſequence of this operation is, that garden fig-trees, which would ſcarcely yield twenty-five pounds of ripe figs, and fit for drying, yield two hundred and eighty pounds.

As to the manner whereby the puncture of the flies contributes to the maturation of the fruit, poſſibly it may be by lacerating the veſſels, and extravaſating the nutritious juice when they depoſit their eggs; with the egg they may alſo convey ſome liquor which gently ferments with the juice of the fig, and ſoftens its pulp. Even the Provence and Paris figs ripen much ſooner by wounding their buds with a ſtraw or feather dipped in oil-olive; plums and pears alſo wounded by inſects are found to ripen the ſooneſt, and in theſe the pulp about the wound is more exquiſite than the reſt. Mem. Acad. Scienc. ann. 1705, p. 447, ſeq.

Olivier, in "Nouveau Dictionaire d'Hiſtoire Naturelle," ſpeaks of this practice as merely the effect of a vulgar error ſanctioned by its high antiquity, and aſſerts that, after a long reſidence in the iſlands of the Archipelago, he is convinced of its futility. Caprification, he obſerves, is unknown in many countries of the Eaſt, has not been adopted in France, Italy, or Spain, and has lately been diſcontinued in ſeveral iſlands of the Archipelago, where it was formerly in uſe, and yet, nevertheleſs, good figs are produced in all theſe countries. The aſſiſtance of the Cynips, or fig-fly, he alleges, cannot be neceſſary to render the young germs fertile, ſince each fig contains near its eye a ſufficient number of male flowers to impregnate all the female ones within its cavity; and that if it were neceſſary, the pollen of the wild fig tree, which is ſuppoſed to be conveyed by the fly to the germs of the cultivated kind, could not fecundate, at the ſame time, thoſe which have attained to a conſiderable ſize, and thoſe which have but juſt, or have not yet appeared, and which do not ripen till two months afterwards. In anſwer to the latter part of the objection, it may, however, be remarked, that Tournefort particularly mentions the ſtrict attention paid by the Greek peaſants to the exact time when the orni of the wild ſhould be placed upon the garden fig-tree, and that every part of the crop muſt be ſuppoſed to have the needful ſupply at its proper ſeaſon. We may alſo add, that the reaſoning employed by Olivier does not at all apply to Tournefort's conjecture concerning the proximate cauſe of the effect produced. The proper queſtion to be conſidered is not whether the fig can produce fertile ſeed without the aid of the fly; of that no well-informed naturaliſt will entertain a doubt; but whether the fruit of the cultivated tree is increaſed in ſize, and heightened in flavour, by the operation. But ſtill it may be aſked, why does not the puncture made by the fly occaſion a ſimilar extravaſation of the nutritious juice of the wild fig, or convey to it the ſame fermenting liquor, and thus improve its native qualities? The ſubject, it muſt be acknowledged, is attended with difficulties which have not yet received a ſatisfactory ſolution. But it ſurely is an unwarrantable degree of ſcepticiſm, on account of theſe, to diſcredit the relations of able obſervers, founded on the experience of ages. Olivier refers to ſome intereſting and inſtructive memoirs publiſhed by Bernard on this ſubject, which we have not at preſent an opportunity to conſult.

Caprification is alſo applied, in a leſs proper ſenſe, to the art of propagating the palm-tree. Act. Erudit. Lipſ. 1721, p. 84.

CAPRIFICUS, in *Botany*, the name of the wild fig-tree.

CAPRIFOLIA, the third order of the eleventh claſs of Juſſieu's natural ſyſtem. It has the following characters: *Calyx* one-leafed, ſuperior, often calyceled, or bracteated at its baſe. *Corolla* generally monopetalous, either regular, or irregular; in a few inſtances polypetalous, petals united by a broad baſe. *Stamens* of a definite number, often five; in the monopetalous genera always inſerted into the corolla, and alternating with its ſegments; in the polypetalous ones ſometimes placed upon the piſtil, alternating with the petals, and ſometimes fixed to the middle of each petal. *Germ* inferior; ſtyle generally ſingle, ſometimes none; ſtigma ſingle, or rarely three. *Fruit* inferior, either a berry, or a one or many-celled capſule; each cell with one or many ſeeds. *Corculum* of the ſeed in a large upper cavity of the large, ſolid periſperm. *Stem* either a ſhrub or a tree; rarely herbaceous. *Leaves* in moſt, oppoſite; in a few, alternate; ſtipules none.

It is divided into four ſections: 1. Calyx calyceled, or bracteated; ſtyle ſingle; corolla monopetalous. Linnæa, trioſteum, ovieda, ſymphoricarpos, diervilla, xyloſteum, and caprifolium. 2. Calyx calyceled or bracteated; ſtyle ſingle; corolla ſubpolypetalous. Loranthus, viſcum, rhizophora. 3. Calyx bracteated; ſtyle none; ſtigmas three; corolla monopetalous. Viburnum, hortenſia, ſambucus. 4. Calyx ſimple; ſtyle ſingle; corolla polypetalous. Cornus, hedera.

CAPRIFOLIACEÆ, the third order of the eleventh claſs of Ventenat's natural ſyſtem, with the ſame characters, diviſions, and genera, as the Caprifolia of Juſſieu, except that Ovieda and Hortenſia are omitted. The plants of this family are generally reckoned aſtringent.

CAPRIFOLIUM, a name given by the old botaniſts to ſeveral plants which Linnæus afterwards placed in his genus Lonicera. Tournefort confined the term to ſuch ſpecies as have their flowers in heads, with an irregular two-lipped corolla. Juſſieu and Ventenat extend it to all that have flowers in heads, or in axillary, ſix-flowered whorls, including thoſe with a corolla nearly regular, the Periclymena of Tournefort. Gærtner ſeems to have comprehended under his Caprifolium, the whole Linnæan genus Lonicera, having reſtored the latter name to the Loranthus of Linnæus, ſome of whoſe ſpecies had been called Lonicera by Plumier and others. The name, it may be allowed, was changed by Linnæus without ſufficient reaſon; but Gærtner has in fact only increaſed the confuſion, in attempting to remove it.

CAPRIGLIA, in *Geography*, a town of Naples, in the province of Principato Ultra, 13 miles S. of Benevento.

CAPRIMA, in *Ancient Geography*, a ſmall town of Aſia Minor, placed by Diodorus Siculus in Caria.

CAPRIMULGUS, in *Ornithology*, a genus of the order Passeres, the *goatſucker* of the Engliſh, and *l'engoulevent* of French authors. The character of the genus conſiſts in having the bill ſlightly curved, very ſmall, ſubulate, and depreſſed at the baſe; mouth extremely large, and fringed at the ſides with a ſeries of briſtles; ears ample; tongue ſhort and very entire; tail not forked, and containing ten feathers; legs ſhort; middle claw with a broad ſerrated edge. Thus far we follow Gmelin, but we have to obſerve, that, although this definition of the Caprimulgus genus is applicable to moſt of the ſpecies, there are ſome with which it will not agree. In Caprimulgus grandis and jamaicenſis, for example, the claw of the middle toe is not ſerrated, and it is ſuſpected there are other ſpecies deſcribed, on the teſtimony of foreign authors, that are deſtitute of this Gmelinian character. Gmelin coincides with Latham in conſidering the entire figure of the tail as an eſſential character of the genus, but there are ſpecies known that have the tail furcated, and others that contain twelve feathers in the tail inſtead of ten, which latter is conſidered by both thoſe writers as an eſſential criterion, amongſt others, of the Caprimulgus genus. The ſpecies deſcribed are 21 in number.

Caprimulgus *grandis*, the *grand goatſucker* of Latham. *Ibijau, Caprimulgus americanus*, Ray. *Le grand ibijau*, and *Crapaud volant de Cayenne* of Buffon. This is ſpecifically diſtinguiſhed by being of a blackiſh colour, variegated with white and yellow; beneath white and black varied; area of the eyes yellowiſh; legs white. Lath. Ind. Orn. Blackiſh, varied with minute brown ſpots and ſtreaks; middle claw not ſerrated. Gmelin.

This gigantic ſpecies of goatſucker was ſuppoſed to be the largeſt of its race till the recent diſcovery of Caprimulgus megacephalis in the Auſtralaſian regions, and was therefore named ſpecifically *grandis*. It is nearly the ſize of a ſmall buzzard, meaſuring 23½ inches in length. The bill, which is three inches long, is covered nearly to the tip with hairs, that completely conceal the noſtrils. The plumage is blackiſh, varied principally with whitiſh and cream-coloured ſpots and marks on the upper parts of the body. The wings are brown on the outer edge; ſcapular feathers chiefly white; quills deep brown, ſlightly barred with white on each ſide, and the ſhafts black. The wings reach almoſt to the end of the tail, which laſt is 11 inches in length, rounded at the extremity, and of a brown colour, with ſeven or eight narrow dotted bars of white. Its legs are brown, and covered nearly to the toes with feathers; middle claw not ſerrated. Inhabits Cayenne, where it is ſaid to ſecrete itſelf within the hollow of ſome decayed tree in the day-time, eſpecially ſuch as ſtand near the water. Willughby's figure of the great ibijau is copied from one given by Marcgrave, that is not very remarkable for its accuracy, both a *creſt* and *horn* being erroneouſly repreſented on its head. There is a ſpecimen of this bird in the Leverian muſeum.

Caprimulgus *megacephalis* of Latham, *l'engoulevent mégacéphale* of Viellot. A ſpecies ſuperior in ſize to Caprimulgus grandis, lately diſcovered in New South Wales. The length of this bird is 28 inches. General plumage blackiſh brown, variegated and ſtreaked with yellowiſh and dull white; breaſt dirty-ferruginous; belly pale-aſh; wings and tail ſpotted, and banded alternately with black and whitiſh. The head and neck appear of a large ſize from the abundance of feathers with which thoſe parts are covered. The bill remarkably ſtronger than any other of the goatſucker tribe, its colour pale brown, and fringed at the baſe with a ſeries of feathers, much longer than the reſt, that ſtand nearly erect, and form a kind of creſt. The legs are yellowiſh.

Caprimulgus *Jamaicenſis*, the *Jamaica goatſucker*. The plumage of this ſpecies is ferruginous, ſtreaked with black: wings variegated with white; quill-feathers brown, with white ſpots; tail barred with black. Lath. Ind. Orn. *Caprimulgus Jamaicenſis*, Gmel. *Guira querea*, Ray, Buffon, &c. and *Mountain owl* of Brown.

This kind, though inferior in ſize to the former ſpecies of goatſucker, is a large bird, being about a foot and a half in length. Sloane deſcribes it in his hiſtory of Jamaica, but miſtakes it for a kind of wood owl, and Brown has fallen into a ſimilar error. The bill is of a black colour, and much bent downwards at the tip, correſponding in this particular with the lower mandible, which is alſo bent in the ſame direction, and cloſe exactly together when the mouth is ſhut; the noſtrils are covered with feathers. The irides are reddiſh-yellow, and the eyes are ſurrounded with a diſk of feathers not unlike thoſe of the owl tribe, and which appear to have deceived both Sloane and Brown. The upper parts of the head, neck, and body are compoſed of a mixture of ferruginous and black, ſtreaked longitudinally; the wing-coverts are partly brown, of a deep caſt, and partly ferruginous and fuſcous varied, and irregularly dotted with blackiſh, and ſome of the inner ones with a mixture of white. The quills are of a deep black brown, marked on the outer edge with eight or nine white ſpots. Its tail is ſeven inches long, cinereous, dotted with black, and croſſed with ſeven or eight bars of black brown. The legs rather large, feathered to the toes, and armed with black claws, the middle one of which, as in the former bird, is not ſerrated. This ſpecies, as its name implies, is a native of Jamaica, where it is reported to be uncommon; it inhabits woods, and feeds principally on inſects.

Caprimulgus *griſeus*, *grey goatſucker*. General colour grey; wings black, with pale grey lines; tail browniſh grey with fuſcous lines. Gmel.

A ſpecies thirteen inches in length, that inhabits Cayenne: the bill is of a brown colour above and yellow beneath; tail five inches in length, and ſcarcely extending beyond the length of the wings when the bird is at reſt. Buffon, who deſcribes this ſpecies, calls it *l'engoulevent gris*.

Caprimulgus *carolinenſis*, *Carolina goatſucker* of Cateſby, a kind diſtinguiſhed by having the upper part of the plumage waved with grey and blackiſh; beneath reddiſh-grey, with ſmall blackiſh lines; three exterior tail-feathers white on the inner edge. Ind. Orn. "Supra lineis tranſverſis angulatis alternis atris et griſeis varius, ſubtus ex rufo griſeus lineis nigricantibus longitudinalibus, cauda griſeo atro cancellata." Gmel. We have adopted Dr. Latham's ſpecific character of this bird, in preference to that of Gmelin, as being moſt expreſſive. The ſpecies inhabits Virginia and Carolina, and, like the reſt of the goatſuckers, appears only on the wing in the evening, or when the ſky is obſcured with heavy clouds preceding rain. The North Americans, it appears from Brown and other writers, call it the rain-bird, in alluſion to the latter circumſtance. It is the ſhort-winged goatſucker of the Arctic Zoology.

This does not exceed the common European goatſucker in point of ſize. The bill is duſky; upper parts of the head, neck, and body tranſverſely variegated with zig-zag alternate lines of duſky-brown and grey; the crown has alſo ſome ſpots of the latter colour, and on the wings are both ſpots and longitudinal yellowiſh and duſky ſtreaks. The ſides of the head, and all the under parts, are rufous-grey, marked with longitudinal blackiſh lines; from the gape of the mouth along the jaw on each ſide is a white ſtreak; and beneath this are a few yellowiſh ſpots; quills barred with duſky and grey, and ſpotted on the outer webs with yellow; on the inner web of the three firſt is a large white ſpot. The tail is four inches long, of a grey colour, with duſky bands and lines; legs brown, claws black, the middle one ſerrated. This bird is ſaid to lay its eggs on the ground, and it appears they very much reſemble thoſe of the lapwing.

Caprimulgus *Guianenſis*, the *Guiana goatſucker*. Colour tawny, ſtreaked and ſpotted with rufous; beneath the throat a white lunar band. *Le montvoyau de la Guiane, et Tette-chevre roux de la Guiane* of Buffon.

This kind, which inhabits Guiana, is nine inches in length. The bill is about three quarters of an inch in length, and is beſet with briſtles. The general colour of the plumage fulvous, with an irregular mixture of rufous throughout; on the top of the head, and hind part of the neck the ſtreaks are longitudinal, but on the upper part of the back oblique, as well as mixed with ſpots of an irregular ſhape on the reſt of the upper parts. Beneath, the plumage much reſembles that above, but the ſpots or markings are moſtly placed in a tranſverſe direction. From the gape ariſes a white band, which paſſes along the jaw and under the throat. The quill-feathers are black, the firſt five or ſix marked with a white ſpot. Tail three inches long, and extending an inch beyond the wings when they are cloſed. This bird, we are informed, is frequently obſerved to repeat the three ſyllables *mont-voy-au* very diſtinctly, when flying abroad at twilight in ſearch of prey.

Caprimulgus *rufus*, the *rufous goatſucker*, *l'engoulevent roux de Cayenne* of Buffon, and *Crapaud-volant, ou Tette chevre de Cayenne*, Pl. Enl. The ſpecies is diſtinguiſhed by being of a rufous colour, varied with black in longitudinal ſtreaks; wings, and lower part of the body faſciated with blackiſh; quill-feathers varied with rufous and black, in alternate ſtripes.

Somewhat larger than the foregoing ſpecies, being ten inches and a half in length. It inhabits Cayenne. The bill is of a pale brown colour; the irides yellow; and the plumage varied as before obſerved, with rufous, black, and a few white ſpots. The throat is marked tranſverſely with lines; the lower part of the body is alſo lineated, but the lines increaſe in breadth as they paſs backwards, the upper part of the belly is blackiſh, the lower rufous. The tail is banded with black, and exceeds the wings by half an inch. The legs are fleſh colour.

Caprimulgus *Europæus*, the *European goatſucker*. The colour black, varied with cinereous, fuſcous, ferruginous, and white; beneath reddiſh-white, with fuſcous bands. "Niger, cinereo, fuſco, ferrugineo et alba varius, narium tubis obſoletis." Linn. Fn. Suec. *Nocturnal goatſucker*, Pennant.

The European goatſucker, as it is generally called, is a native of Aſia and Africa, as well as Europe. Its length is ten inches and a half. The plumage is of a deep blackiſh colour, beautifully ſpeckled and diverſified with ſpots of grey, ferruginous, and white. The tail is four inches long; the legs ſhort, rough, or ſcaly, and feathered much below the knee; the toes connected together on each ſide by a ſlight membrane, and the middle claw ſerrated. The plumage of the male is brighter than in the female, and it is beſides known by having an oval white ſpot on the inner webs of the three exterior quill feathers, and another at the tip of the outer feathers of the tail.

A variety of this ſpecies is reported to have been brought from China by Sonnerat. This was rather larger, and the colours ſomewhat darker, than in our common kind; the feathers of the wings were black, marked with yellow ſpots, each incloſing a black dot in the centre, and the whole were ſo diſpoſed, that, at the firſt glance, the wings appeared to be marked tranſverſely with ſeven alternate bands of yellow, and the like number of black ones.

Fern-owl, churn-hawk, dorr-hawk, and night-jarr are the moſt familiar provincial names of this common goatſucker in various parts of England. Latham calls it the European goatſucker, this being the only bird of its genus that is found in Europe. It commonly arrives in England the latter end of May, and remains in the ſouthern parts of the iſland till about the end of September. In its paſſage from the eaſtward, it viſits Malta, and the ſouth of Europe, a month ſooner than England; and it is ſeldom earlier than October that it quits France; they have been ſeen in that country till

November. Some French authors aſſure us, that ſeveral birds of this ſpecies have been ſhot in the woods of Voſges in the middle of winter, but ſuch occurrences are very rare. The ſpecies has been recently obſerved in Siberia and Kamtſchatka, where it lives not only in foreſts but alſo in open countries, where it finds rocks, or high banks, for ſhelter. With us it lives in woods, and feeds on inſects, which it collects on the wing, in the duſk of the evening and morning, like the owl, and remains ſecreted, like that nocturnal bird, in the hollow of a tree, or ſome dark receſs, during the day-time. By chance, however, it has been noticed on the wing in the day-time when diſturbed in very gloomy weather. It is a great deſtroyer of the cockchafer-beetle, many of which, with other inſects, are uſually diſcovered in its ſtomach on diſſection. The note of this bird is ſingular, reſembling the noiſe of a large ſpinning-wheel, or as ſome liken it to that of the letter R frequently repeated, and which it is ſaid to emit only when perched on the branch of a tree, with its head hanging down in the duſk of the evening. Beſides this, it has a ſharp ſqueak, which is ſuppoſed to be its call of love, as the male is obſerved to utter it when in purſuit of the female. Its manner of perching is curious, for it almoſt conſtantly places itſelf longitudinally upon the branch, inſtead of acroſs, like other birds. The goatſucker was accuſed by the ancients, and many of the elder writers, of ſucking the teats of goats, and it is from this vulgar prejudice its popular name of goatſucker is derived; this abſurd notion, though countenanced by Buffon, is juſtly exploded by all modern authors. The female makes no neſt, but lays her eggs upon the bare ground, or looſe crags, without any apparent care; they are uſually two in number, of a white colour, and blotched with bluiſh brown.

Caprimulgus *Virginianus*, *Virginian goatſucker.* Colour brown, varied with grey and reddiſh; beneath reddiſh-white, tranſverſely ſtreaked; chin with a triangular white ſpot; area of the eyes and neck above ſpotted with orange.

This is ſmaller than the European goatſucker, its uſual length being eight inches, but ſhould the *moſchito-hawk* of Hudſon's bay, deſcribed on the authority of Mr. Hutchins by Latham, in his Supplement, prove to be the ſame bird as is generally ſuſpected, it ſometimes attains to the length of nine inches and a half. All the upper parts of the body are of a dull brown, tranſverſely variegated and blended with rufous brown, and an intermixture of aſh-colour, with a ſlight proportion of grey on the wings; on the chin is a white triangular ſpot, mottled with orange at the under part. The quills are duſky, the firſt five marked with a white ſpot about the middle; tail marked ſimilar, the two outer feathers with a ſpot of white near the extremity; legs fleſh-colour, middle claw ſerrated.

During the ſummer, this bird inhabits Virginia, where it firſt arrives about the middle of April, and frequents the mountainous parts, but will frequently approach the houſes in the evening, when it commonly ſettles on a rail or poſt, and cries for ſeveral times together very loud, ſomewhat like the word *whiperiwhip*, or *whip-poor-will*, pronouncing the firſt and laſt ſyllables loudeſt. The noiſe of this bird, which is both loud and diſagreeable, continues oftentimes the whole night, and it not unfrequently happens that four or five birds of the ſame ſpecies keep in company, and cry in concert together. They ſubſiſt chiefly on inſects. The eggs are of a greeniſh colour, with duſky ſpots and ſtreaks. Kalm ſpeaks of the fleſh of this bird as an article of food.

Linnæus appears to have conſidered this as a variety of the common or European goatſucker, *Caprimulgus Europæus β*. Both Cateſby and Buffon call it *whip-poor-will*, in alluſion to its note; it is the long-winged goatſucker of the Arctic Zoology, and Virginia goatſucker of Latham.

Caprimulgus *vittatus*, *ſtriped goatſucker*, and *l'engoulevent a bandes noires* of Viellot. A new ſpecies recently diſcovered in New Holland, where the Engliſh ſettlers call it the moſquito hawk. This bird is about nine or ten inches in length; the upper part of the head and neck are black, with a ſtripe of the ſame colour paſſing, in the form of a creſcent, behind the eyes. The black ſtripe on the upper part of the neck deſcends on each ſide to about the middle, where it divides into two diſtinct branches. Thoſe parts of the head whare the black does not appear is of a pale carnation or fleſh colour. The upper portion of the neck, with the body beneath, are of a ſomewhat ſimilar colour, but more inclining to ferruginous. Under the eyes, ſides of the neck, and upper part of the wings are marked with ſpots and vermicular lines; back and wing-coverts obſcure blue, ſpeckled with black; quills blackiſh, ſpotted and edged with ruſt-colour; tail-feathers dark brown ſpotted with ferruginous, and ſlightly forked; bill large, and of a black colour; legs reddiſh fleſh colour.

Caprimulgus *albicollis*, *white-throated goatſucker* of Latham. The plumage is rufous brown, varied with white and blackiſh ſtreaks; beneath browniſh with black lines; a triangular white ſpot on the throat; tail ſomewhat cuneated.

Length ten inches and a quarter; bill brown with the tip black, and the noſtrils rather prominent; head ſtreaked with black, upper parts of the body the ſame, but more obſcure; the ſcapulars, and moſt of the outer wing coverts have a black band near the end, and the tips yellowiſh buff-colour; leſſer quills ſpotted with rufous cream-colour on the outer web, the greater duſky black, and croſſed about the middle with a white bar; tail ſomewhat wedge-formed, the third feather white, ſecond white within and black without, the outermoſt with a white ſpot near the baſe; legs brown; middle toe very long, and greatly ſerrated. Deſcribed by Dr. Latham, from a ſpecimen in the collection of general Davies, that is ſuppoſed to have come from Cayenne.

Caprimulgus *ſemitorquatus*, *white-collared goatſucker* of Latham, is deſcribed on the authority of Buffon, who calls it *le petit engoulevent de Cayenne*; Gmelin calls it *ſemitorquatus*. This bird is blackiſh, varied with rufous and grey, with a white lunule on the lower part of the collar. Length eight inches, and inhabits Cayenne.

Caprimulgus *Braſilianus*, *Braſilian goatſucker.* Plumage yellowiſh black, varied with white ſpecks; beneath varied with black and white; area of the eye yellowiſh white.

Size of a ſwallow. Bill and eyes blackiſh; wings and tail even; legs white, the middle claw ſerrated at the outer edge; tail expanſile. This, as the name implies, inhabits Brazil.

Caprimulgus *acutus*, *ſharp-tailed goatſucker*, and *l'engoulevent acutipenne de la Guyane* of Buffon.

This kind is readily diſtinguiſhed by the pointed tips of the tail-feathers from the reſt of the ſpecies in the ſame tribe; the plumage is blackiſh, faſciated above with grey, and beneath with rufous; head and collar reddiſh brown. It inhabits Guiana, and is about ſeven inches and a half in length. The ſhafts of all the tail-feathers are bare of webs at the tips; bill and legs black.

Caprimulgus *Cayennenſis*, *Cayenne*, or *white-necked goatſucker*. Plumage rufous and grey, varied with black undulated lines; throat and ſtripe on the wing white; temples rufous, with five black ſtreaks. *Caprimulgus cayanus*, Latham.

Deſcribed on the authority of Buffon, who calls it *l'engoulevent de Cayenne*, as being ſeven inches and a half in length. Bill black, irides yellow; head and neck tinged with rufous; lower part of the belly ſpotted with black; two middle feathers of the tail grey, croſſed with five or ſix blackiſh bands; the reſt black, bordered with white; legs yellow brown. This bird inhabits Cayenne, where it is found in the plantations, and when on the wing is ſaid to utter a weak cry, which has been compared to that of the toad, and it has alſo another note that ſomewhat reſembles the barking of a dog. It is not a timorous bird by any means, neither is it a rare ſpecies.

Caprimulgus *Americanus*, *American goatſucker*, diſtinguiſhed ſpecifically, according to Gmelin, by having the noſtrils very prominent and cylindrical. The plumage is variegated with black, grey, and obſcure brown.

This is a Linnæan ſpecies, *Caprimulgus Americanus* of that naturaliſt. Ray calls it the ſmall wood-owl, as does likewiſe Sloane, in his Hiſtory of Jamaica; it is *l'engoulevent à lunettes, ou le haleur* of Buffon, and other French authors. This bird is ſeven inches in length; the bill black, and beſet with briſtles; the noſtrils projecting about one-eighth of an inch; legs and claws grey. Like the reſt of its tribe, this kind feeds on inſects. It is found in various parts of America.

Caprimulgus *Novæ Hollandiæ*, *creſted goatſucker* of Phillips' Voyage to Botany bay. This is of a brown colour, clouded with black and whitiſh, and whitiſh beneath; neck and breaſt with duſky bands; creſt on the front erect and ſetaceous.

Inhabits New Holland, and is rather ſmaller than the European goatſucker. The length is nine inches and a half. Its bill is black; gape wide, and yellowiſh within; behind the baſe of the upper mandible ariſes a creſt of twelve briſtles, which are thinly bearded at the ſides; quill-feathers brown, the five or ſix exterior ones with whitiſh ſpots on the outer ſide; tail rounded, fuſcous, with twelve whitiſh bands clouded with blackiſh; legs rather long and yellow.

Caprimulgus *Aſiaticus*, *Aſiatic goatſucker*, or *Bombay goatſucker* of Latham. Plumage pale-aſh, clouded with black and ferruginous; breaſt banded with cinereous; crown with a blackiſh ſtreak, and a pale ſpot on the jaws and chin.

This ſpecies was firſt deſcribed by Dr. Latham, from a ſpecimen in the poſſeſſion of ſir Joſeph Banks, in the Supplement to his Synopſis of Birds. It is, he ſays, the ſize of the Virginia goatſucker: length eight inches and a half. Bill duſky; general colour of the plumage not unlike that of the Siberian owl, being a beautiful mixture of pale aſh colour, mottled with duſky down the middle of the crown; on each ſide of the under jaw is a pale ſtreak; and on the throat a whitiſh ſpot; the breaſt croſſed with numerous cinereous bars; between the legs pale rufous; the quills are duſky, barred with rufous; the firſt ſhorteſt; four of the greater quills have a ſpot of white on the inner web; the tail marked the ſame, but the two middle tail-feathers are likewiſe mottled, as the back; the two outer ones on each ſide have the ends white for about an inch, but the white extends higher up on the outer webs; the middle toe is greatly pectinated. Inhabits Bombay. Lath. Suppl.

It ſeems this bird has been alſo diſcovered in Africa by le Vaillaint, who names it *l'engoulevent muſicien*, in compliment to its note, which he obſerves is both piercing and melodious, contrary to what has been advanced by an Engliſh writer (Dr. Latham), who aſſirms that its noiſe is horrible. It has the ſame manners of life as the European goatſucker.

Caprimulgus *Indicus*, *Indian goatſucker*. Colour pale aſh, tranſverſely lineated with black; cheeks, breaſt, and wings ſpotted with ferruginous; tail-feathers bluiſh, faſciated with black, the exterior one varied with ferruginous and black.

Latham deſcribes this ſpecies, in his Supplement of Birds, as a native of India, on the authority of lady Impey, without mentioning its ſize. Another account is given of it by Viellot, a French naturaliſt, under the name of *l'engoulevent cendré, rayé de noir*, but which is a literal French tranſlation of the following deſcription. "Crown and back whitiſh aſh-colour, elegantly marked with minute duſky lines; cheeks, breaſt, wing-coverts, and ſecondaries beautifully marked in the ſame manner with lines and large ſpots of ruſt; prime quills duſky; middle feathers of the tail light aſh, croſſed with a few black bars; outermoſt feathers ruſty and black."

Caprimulgus *torquatus*, *gold-collared goatſucker*. This is an inhabitant of Braſil, and is about the ſize of the common lark. The plumage is cinereous-brown, varied with whitiſh and dull yellowiſh ſpots; on the hind head a golden ring; two middle tail-feathers longeſt.

Though the body of this bird is ſcarcely larger than a lark, its length of wings and tail is conſiderable. The upper mandible of the bill is hooked, and beſet at the baſe with ten or twelve thick briſtles; eyes black, head large, flat, and broad. The two middle tail-feathers are eight inches in length, but the reſt are ſhorter; legs duſky, with black claws, the middle one of which is ſerrated. This is called by Briſſon *Tette-chevre du Breſil;* and *Le petit engoulevent tacheté de Cayenne* by Viellot.

Caprimulgus *longipennis*, *Leona goatſucker* of Shaw, Nat. Miſc. A native of Sierra Leona. Size of a ſtarling. The plumage is grey, variegated; wings ſpotted with rufous and black; on each ſhoulder a long naked-ſhafted feather.

Viellot deſcribes this curious bird under the title of *l'engoulevent de Léone*, after Dr. Latham, who very lately publiſhed an account of it, in which he names it *Caprimulgus macrodipterous*. The French author, Viellot, gives it as a new ſpecies, on the authority of Latham; from which we may preſume he was either not aware of its having been previouſly deſcribed by Dr. Shaw, as above mentioned, or did not think proper to acknowledge the circumſtance.

CAPRIOLES, derived from *capreolus*, a diminutive of *capra*, *goat*, in *Horſemanſhip*, are leaps which a horſe makes in one and the ſame place, without advancing forwards; and that in ſuch manner that when he is in the air, at the height of his leap, he yerks or ſtrikes out with his hind-legs as near and even together, and as far out as he can ſtretch them; in which action, he clacks, or makes a noiſe with them.

The capriole is the moſt violent of all the high-raiſed airs: there are ſeveral kinds of caprioles; as a *right capriole, back capriole, ſide capriole, broken capriole*, the *open capriole*, &c.

To make this air perfect, the horſe ſhould raiſe his fore parts and his hinder to an equal height; and when he ſtrikes out behind, his croupe ſhould be on a level with his withers. In riſing, and in coming down, his head and mouth ſhould be quite ſteady and firm; and he ſhould preſent his fore head quite ſtrait: when he riſes, his fore-legs ſhould be bent under him a good deal, and equally. When he ſtrikes out with his hinder legs, he ought to do it nervouſly, and with all his force; and his two feet ſhould be even, of an equal height, and their action the ſame: laſtly, the horſe ſhould, at every leap, fall a foot and a half, or the ſpace of two feet diſtant from the ſpot from which he roſe. In order to make caprioles, it is not abſolutely neceſſary that a horſe ſhould paſs through *curvets* and *balotades;* becauſe ſome horſes are naturally more light and active in their loins than ſtrong, and which are brought to leap with more difficulty, than to the other airs in which their ſtrength muſt be much more united, and their diſpoſition attended to; but nevertheleſs it is certain, that if the horſe is brought to riſe by degrees, and is worked in the intermediate airs, before he undertakes the caprioles, he will not weaken and ſtrain himſelf ſo much, and will be ſooner confirmed in his leſſons, than one which begins at once with the caprioles. The motions of a horſe, when he makes a perfect capriole, have an effect directly oppoſite to that of peſades and curvets. Theſe two airs are proper to aſſure the head of the horſe, and to make it light, and this by ſo much the more as the principal action depends upon the haunches, and a moderate appuy of the mouth; but caprioles are apt to give too great an appuy, becauſe the horſe, when he makes the ſtrongeſt action of his air, that is, when he ſtrikes out as he is coming to the ground, is entirely ſupported by the hand; therefore, before he is put to leap, he ought to have a perfect appuy, and his ſhoulders ſhould at leaſt be ſuppled and lightened, by having made peſades; and he ſhould be without fear, anger, or any kind of uneaſineſs, becauſe, by leaping, he acquires a knowledge of his own ſtrength and power, and he may apply it to bad purpoſes, to free himſelf from obedience, and to indulge his caprice and ill humour. Some horſes have a diſpoſition to this air, and ſufficient ſtrength to go through it; but their mouths are ſo delicate, ſenſible, and averſe from the hand, that you cannot ſupport them without hindering them from advancing: hence it follows, that their action before is cold and ſlow, and never ſufficiently high, and they cannot be carried forward when they raiſe their croupe, and ſtrike out; and it is impoſſible to keep them firm as they come down. To remedy this, begin their leſſon upon the trot, and preſs them in it ſo ſmartly, as to make them often go into the gallop; obſerve a medium, in order to ſave their ſtrength and vigour, that they may furniſh as many leaps as are requiſite to the perfection of the air. Purſue the ſame courſe with a horſe that is too ſtrong, and who retains and avails himſelf of the ſtrength of his back, ſo as not to make his leaps freely and readily; by this means you will abate his ſuperfluous vigour, which ſerves only to diſunite and make him troubleſome. It is uſual to ſupple a horſe that is light in the hand by means of the trot, before you teach him to leap; but a contrary method muſt be obſerved with thoſe which are heavy and clumſy, or that pull upon the hand. Gallop and trot them; and this exerciſe will take away all fear of the aids and corrections, and the following day they will preſent themſelves more freely and willingly. Inſtead of trying to correct the horſe, which pulls upon the hand, compel him to make ſome caprioles with his face to the wall, and keep him up to it cloſer, or farther off, as you find him heavy, or endeavouring to force the hand; and by this method you will conſtrain him to ſhorten his leaps, and to be more attentive to his buſineſs. If he abandons himſelf, or bears too hard upon the hand, hold him firm at the end of his leap, and in the inſtant when his feet are coming to the ground, yield your hand immediately to him, and he will abandon himſelf much leſs upon the bit. If he retains himſelf, and hangs back, eaſing your hand to him will not alone be ſufficient; but to make him advance, you muſt puſh him to his bit, by aiding him briſkly, and in time, with your legs.

To dreſs a horſe to the caprioles, the pillars may be employed, or they may be diſpenſed with. When the pillars are uſed, tie him to them, make him keep up to his bit properly, or what is called "fill up the cords," and endeavour, by little and little, to make him riſe before, taking care to make him bend his knees, and gather up his legs, as much as you poſſibly can. For this purpoſe, uſe your ſwitch briſkly; for if you can teach him to bend his legs well, his manege will be much more beautiful, and he will be much lighter in the hand. When the fore-part has been thus gained, put him in the pillars again; ſhortening the cords, in order to make him raiſe his croupe from the ground, and yerk out equally, and, at the ſame time, with both his hinder legs, which he muſt be taught to do, by attacking and ſtriking him upon the croupe with the ſwitch or chambriere. When he is able to riſe before and laſh out behind, let him be taught to unite theſe two times, and perform them together. Let him then be mounted, and always in the pillars; and let the rider ſupport him in the hand, and put him to make one or two leaps, without leaning upon the cords of the caveſon, in order that he may learn to take a juſt appuy, and to feel it. As ſoon as he begins to know and obey the hand, he ſhould be aided gently with the calves of the legs, ſhould be ſupported, and you ſhould "pinch" him delicately and finely with both ſpurs. If he anſwers once or twice to theſe aids, without loſing his temper, or being angry, you will have great reaſon to expect that he will ſoon furniſh his leaps equally and juſtly, with reſpect to the hand and heel. When he has been ſo far advanced by means of the pillars, walk him ſtrait forward a certain ſpace; and if he does not offer to riſe of himſelf, try to make him. If he himſelf takes the right time, ſeize the moment, avail yourſelf of it, and let him make two, three, or four caprioles, or one or two, as you may judge it neceſſary. By letting him thus walk calmly and quietly, in a ſhort time he will, of himſelf, begin to make caprioles ſtrait forward; but in caſe he ſhould diſcover any ſigns of reſiſtance to the hand or heel, or the other aids, recourſe ſhould be had immediately to the caveſon and pillars. The method, now deſcribed, of adjuſting and dreſſing a horſe for caprioles, by means of the pillars, is very dangerous in itſelf, and capable of ſpoiling and making a horſe become deſperate and ungovernable, unleſs it be practiſed by perſons of conſummate ſkill and experience.

Mr. Berenger prefers the following method, which, though more difficult and painful to the horſe, is better and more ſure. Having well exerciſed the horſe in "peſades," walk him ſtrait forward, keeping him "together," and ſupporting him ſo as to hold and keep him in the hand, but not ſo as to ſtop him entirely. After this, ſtrike him gently with the end of the ſwitch upon his croupe and buttocks, and continue to do it till he lifts up his croupe and kicks. Then careſs him, and let him walk ſome ſteps, and then attack him again, not minding to make him riſe before, nor hindering him from it, if he offers ſo to do. Remember to encourage and coax him every time that he anſwers to the aids, and obeys. When he is thus acquainted with the aid of the ſwitch, let him make peſades of a moderate height, ſtrait forward, and at the ſecond or third, attack him behind with your ſwitch, to make him laſh out. If he obeys, make him riſe "before" again in the minute that his hinder legs come to the ground, in order to make him furniſh two or three peſades, to work his haunches. After this, coax and careſs him without letting him ſtir from the place, if his appuy be firm and good; and in caſe it is hard, make him go backwards, or if it is light and juſt, let him advance quietly and ſlowly. To enable him to make his leaps juſt, and to know the exact time of making them, no attention ſhould be given to the number of peſades he makes before or after his leap, but at the moment when you feel him prepared, and whilſt he is in the peſade, aid him briſkly behind; letting him, in the beginning, not riſe ſo high "before," when you intend he ſhould yerk out behind, as he would, were he only to make a peſade, that ſo his croupe may be more at liberty, and he may yerk out with greater eaſe. In proportion as his croupe becomes light and active, you may raiſe his fore-part higher and higher, and ſupport it while in the air, till he makes his leaps true, and in juſt proportion. When theſe leſſons have been ſufficiently practiſed, you may retrench by degrees the number of the peſades, which ſeparated and divided the leaps. You may now demand of him two leaps together; and from theſe you may come, with patience and diſcretion, to three, or from three to four leaps; and, laſtly, to as many as he can furniſh in the ſame air and with equal ſtrength. Remember always to make him finiſh upon his haunches; and this is the only ſure way of preventing all the diſorders a horſe may be guilty of from impatience and fear. Some horſes will leap very high, and with great agility ſtrait forwards, which, when put to leap upon the voltes, uſually loſe their natural grace and beauty, for want of ſtrength and not being equal to the laſh, in which all their motions are forced and conſtrained. If a horſe has a firm appuy and ſtrength ſufficient to furniſh this air upon the voltes, begin by making him know the ſpace and roundneſs of the volte to each hand; let him walk round it in a ſlow and diſtinct pace, keeping his croupe very much preſſed and confined upon the line of the volte, which ought to be much larger for this air than for "croupades" and "balotades." When this is done, make him riſe, and let him make one or two caprioles, followed by as many peſades; then walk him two or three ſteps upon the ſame line; then raiſe him again, ſupporting him more and more, and keeping him even upon the line of the volte, ſo that it may be exactly round, and confining his croupe with your outward leg. If this leſſon be given with judgment, your horſe will ſoon make all the "voltes" in the ſame air; and to make him furniſh a ſecond, as ſoon as he has cloſed and finiſhed the firſt, raiſe him again, and without letting him ſtop, get from him as many leaps as you can, working him always upon the volte, in which he walks and leaps alternately, till he cloſes and ends it with the ſame vigour and reſolution as he did the firſt. Aid always with the outward rein, either upon the voltes, or when you leap ſtrait forward, you will narrow and confine the fore-parts, and enlarge the hinder parts, by which means the croupe will not be preſſed, but free and unconſtrained. See Curvets and Voltes. The ſureſt way to ſucceed, when you undertake to dreſs a horſe to caprioles, is to arm yourſelf with an invincible patience, and to prefer for this purpoſe ſuch horſes as have a diſpoſition, are active, light, and have a clean ſinewy ſtrength, to ſuch as are endowed with greater ſtrength and force; for theſe laſt never leap regularly, and are fit for nothing but to break their riders' backs, and make them ſpit blood, by their irregular, violent, and unexpected motions. Berenger's Hiſt. and Art of Horſemanſhip, vol. ii. ch. 20.

CAPRISCUS, in *Ichthyology*, a ſpecies of Balistes, that inhabits the Indian, Mediterranean, and American ſeas. It is ſpecifically diſtinguiſhed by having the dorſal ray ſerrated in front; ventral ſingle and low; tail rounded; ſnout ſomewhat obtuſe. Gronov.

This is capriſcus of Artedi and others, caper of Renard, and poupou-noble of Renard. It is an intereſting ſpecies, and has the body variegated with many colours.

Capriscus, is alſo the name given by Klein to Balistes Monoceros, which ſee.

CAPRONE, in *Geography*, one of the Greek iſlands N.W of Stanchio, larger than Capra, and near it. See Capra.

CAPRONEZA, a ſmall town of Hungary, in Sclavonia; 12 miles from the Save.

CAPROTINA, in *Mythology*, a name given to Juno by the Romans, in commemoration of a ſingular event recorded in the Saturnalia of Macrobius, l. i. c. 12. After the Gauls had quitted Rome, the neighbouring people took the advantage of their departure, and of the exhauſted ſtate of the republic, and beſieged the city under the conduct of Lucius, dictator of the Fidenates. They demanded of the Romans the ſurrender of their wives and daughters. The ſlaves, in conformity to the counſel of one of them, named Philotis, aſſumed the habits of their miſtreſſes, and preſented themſelves to the enemy; who, conceiving them to be the Roman females whom they had demanded, diſtributed them through their camp. Under the pretence of celebrating a feaſt, they induced the officers and ſoldiers to drink freely; and when they were all aſleep they gave a ſignal to the city by means of a wild fig, called in Latin "caprificus." The Romans ruſhed ſuddenly upon their enemies, filled their camp with carnage, and gave liberty to their ſlaves, together with a ſum of money at their marriage. They inſtituted alſo a feaſt to Juno, who in reference to the wild fig, was ſurnamed "Caprotina." The day on which Rome was thus delivered, and which was the nones of July, was called the "Caprotine" nones. This ſingular victory is mentioned by Plutarch and Arnobius.

CAPROTINIA, feaſts of Juno Caprotina, which were celebrated on the 9th of July, in favour of the female ſlaves. During this ſolemnity they ran about beating themſelves with their fiſts and with rods. None but women aſſiſted in the ſacrifices offered at this feaſt.

CAPRUS, in *Ancient Geography*, a river of Aſſyria, which, as well as the Gorgus, are ſuppoſed to have flowed between the two cities of Nineveh and Seleucia. Theſe two rivers are now called, as ſome have ſuppoſed, the Great Zab and Little Zab. Thevenot calls theſe rivers Zarb, but ſpeaks only of one, which he ſaw fall into the Tigris: he calls it a large river, making it half as broad as the Tigris, and obſerves, that it is very rapid, that its water is whitiſh, and very cold; which he would ſeemingly account for by its falling from the mountains of Curdeſtan, and being merely ſnow-water.

CAPSA, or Capse, now *Gafsa*, one of the ſtrong cities of Jugurtha, in Africa, concerning the ſituation of which authors are diſagreed. Ptolemy places one Capſa in the ancient Bizacium, upon a ſmall river which falls into the gulf which is formed by the river Triton at its mouth; and the Itinerary of Antonine marks it between Telepte and Tacapé, ſo that this Capſa was north of that which Salluſt mentions. The latter Capſa of Salluſt and of Ptolemy is placed in Numidia, amidſt the deſerts, and its foundation is aſcribed to Hercules the Libyan. It was taken by Marius, according to the relation of Florus; and Oroſius ſays, that it was full of royal treaſures. This city was deſtroyed in the war of Cæſar againſt Scipio. Dr. Shaw (Trav. p. 124.) places Capſa or Gafſa 12 leagues to the S.E. by E. of Ferreanah (the ancient Telepté); and he infers from ſome imperfect inſcriptions that preſerve the ancient name of the city, as well as that of "Jugis Aqua," particularly deſcribed by Salluſt, and appropriated to Capſa, that the Capſa of Salluſt and Ptolemy were the ſame; though Bochart and Cellarius have ſuppoſed the contrary. This Capſa was formerly encircled by ſtrong walls, towers, and baſtions; but it was taken and demoliſhed by Occuba, a famous Arab general. The walls of the citadel are ſtill remaining, as monuments of its ancient glory and ſtrength, 24 fathoms in height and 5 thick, built of large ſquare ſtones, which have now acquired the ſolidity and firmneſs of a rock. The walls of the town were rebuilt by the inhabitants ſince their firſt demolition; but were afterwards deſtroyed by Jacob Almanzor, who ſent a governor and troops into the province. In Marmol's time Capſa was very populous, abounding with ſtately moſques and other ſtructures of ſuperb and regular workmanſhip; but it is now occupied by an indigent people, fleeced and oppreſſed by the Tuneſe government. It is built on a riſing ground, and near it are plantations of palms, olives, piſtachios, and other fruit trees, beyond which, occupying a ſmall extent, is an interchange only of barren hills and valleys. The water which refreſhes theſe plantations ariſes from two fountains; the one within the citadel, the other in the centre of the city. The latter, ſuppoſed by Dr. Shaw to have been the "Jugis Aqua" of Salluſt, (Bell. Jugurth. § 94.), and the "Tarmid" of Edriſi, (Geog. Nub. p. 86.) was formerly covered with a cupola. It is ſtill walled round, and diſcharges itſelf into a large baſon, deſigned originally for a bath. This fountain and the other unite before they leave the city, and form a pretty large brook, which, from the quantity of the water, and the rapidity of the ſtream, might continue its courſe to a great diſtance, were it not conſtantly employed and imbibed in the uſes above-mentioned. The climate and inhabitants of Capſa are unhealthy. Both men and women dreſs handſomely, except their feet, which they cover with coarſe ſhoes of bungling workmanſhip, and made of the rough ſkins of wild beaſts, equally inconvenient and unbecoming. The authors of the Modern Univerſal Hiſtory, (vol. xiv. p. 281, 8vo.) ſay, that its moſt probable ſituation is in N. lat. 33° 15′. and E. long. 9° 3′, 30 leagues from Teuſera.

Capsa, in *Geography*, a town of European Turkey, in Romania.

CAPSARIUS, from *capſa*, *ſatchel*, in *Antiquity*, a ſervant who attended the Roman youth to ſchool, carrying a ſatchel with their books in it, ſometimes alſo called *librarius*.

Capsarius was alſo an attendant at the baths, who took charge of the veſtments of thoſe by whom they were frequented. The Capſarii, it ſhould ſeem, at leaſt in the latter days of the empire, had an officer particularly placed over them for the ſummary adminiſtration of juſtice. Dig. lib. i. tit. 15. § 3. Adverſus capſarios quoque, qui mercede ſervanda in balneis veſtimenta ſuſcipiunt, judex eſt conſtitutus: ut ſi quid in ſervandis veſtimentis fraudulenter admiſerint, ipſe cognoſcat.

Capsarius, from *capſa*, *cheſt*, among the Roman *Bankers*, was he who had the care of the money cheſt, or coffer.

CAPSCHAC, or Kipschak, in *Geography*, a conſiderable country of Tartary, which extends to Europe and Aſia, between the Jaick and the Nieper. It is the country from which the Coſſacks ſprung. It abounds in grain and cattle; and is ſubject to a khan and ſeveral other princes. The people are warriors. Its capital is Serai.

CAPSELLA, in *Botany*, a name given by Cæſalpinus to *thlaſpi burſa paſtoris* of Linnæus, propoſed by Juſſieu, and received by Ventenat as a diſtinct genus, becauſe it differs from the other ſpecies of thlaſpi, in having a triangular, or rather inverſely heart-ſhaped, ſilicle without a border.

CAPSICUM, Guinea pepper, (doubtful whether derived from *καπτω*, *to bite*, on account of the biting heat of the ſeed and pericarp, or from *capſa*, *a cheſt*, alluding to the form and ſtructure of the pericarp.) Linn. Gen. 252. Schreb. 338. Willd. 384. Tourn. Inſt. p. 152. Pl. 66. Gært. 773. Lam. Illuſt. 326. Juſſ. 126. Vent. ii. 374. (Pimento. Encyc. and Nouv. Dict.) Claſs and order, *pentandria monogynia*. Nat. Ord. *Luridæ*, Linn. *Solaneæ*, Juſſ. Vent.

Gen. Ch. *Cal.* perianth one-leafed, five-cleft, or five-toothed, erect, permanent. *Cor.* monopetalous, wheel-ſhaped; tube very ſhort; border five-cleft, ſpreading, plaited; ſegments broad. *Stam.* five, awl-ſhaped, very ſmall; anthers oblong, converging. *Piſt.* germ egg-ſhaped; ſtyle thread-ſhaped, longer than the ſtamens; ſtigma obtuſe. *Peric.* a dry berry, of different ſhapes, two or three-celled, hollow, coloured; receptacles adhering to the partition, dry. *Seeds* numerous, kidney-ſhaped, compreſſed.

Eſſ. Ch. *Corolla* wheel-ſhaped. *Berry* dry. *Seeds* compreſſed. Nearly allied to ſolanum, but differs from it in having a dry, not pulpy pericarp, in the pungent, burning taſte of its ſeeds; and in its general habit, which is ſo much alike in all the ſpecies, that it is not eaſy to give them deciſive ſpecific characters. The great variety that is found in the form and colour of the fruit increaſes the difficulty, and makes it almoſt impoſſible to determine, in many caſes, which are the diſtinct ſpecies, and which are only varieties. Linnæus, in his Species Plantarum, acknowledged only two ſpecies, one annual, the other ſhrubby, with a variety diſtinguiſhed by its ſmall, red, conical fruit. This variety he made a diſtinct ſpecies in his firſt Mantiſſa and Syſtema Naturæ, and added another with a ſomewhat ſhrubby, quadrangular ſtem. The old botaniſts mention many kinds. Miller has ten ſpecies, beſides varieties; but ſeveral of his ſpecies are now eſteemed only varieties. Six of them are herbaceous and annual; at leaſt, as he found by experience, they are ſuch in our ſtoves, their ſtems decaying ſoon after the fruit is ripe; but it may be doubted whether ſome that are perennial in their native climates, may not become annual under our artificial treatment. In the enumeration of ſpecies, we ſhall take La Marck and Poiret for our guides.

Sp. 1. C. *annuum*, Linn. Sp. Pl. Gært. tab. 132. *fig.* 2. Woodville Med. Bot. tab. 144. (Piper Indicum vulgatiſſimum, Bauh. Pin. 102. Vallia-capo-Molago, Rheed. Mal. ii. tab. 35.) "Stem herbaceous; peduncles ſolitary; fruit oblong." *Root* fibrous. *Stem* one to four or five feet high, nearly ſimple, round, a little ſtriated, ſmooth. *Leaves* egg-ſhaped, acuminate, entire, petioled, placed in no regular order; petioles long, flexible, generally ſmooth, but ſometimes, as well as the ſtem, a little pubeſcent. *Flowers* white, lateral; peduncles long. *Fruit* ſmooth and ſhining, very variable in its form and colour; in ſome inſtances long, ſtraight, acute; in others ſhort, thick, obtuſe, and even emarginate at its ſummit: in ſome red; in others yellow; and ſometimes both colours on the ſame plant; in ſome, according to Miller, upright; in others pendant, which has induced us to omit the word pendant, inſerted by La Marck in the ſpecific character, although thoſe plants in Miller's poſſeſſion, which had upright fruit, may poſſibly belong to one of the following ſpecies. A native of the Eaſt and Weſt Indies. 2. C. *fruteſcens*, Linn. Sp. Pl. Lam. Ill. tab. 116. *fig.* 2. (C. braſilianum, Cluſ. Exot. 340. *fig.* 2. C. indicum, Rumph. Amb. tab. 38. *fig.* 3. C. ſiliqua olivæformi, Tourn. Inſt. 153.) "Stem ſhrubby; leaves lanceolate; fruit oblong, ſolitary, rather erect." *Stem* a little rough, nearly round, and like the other parts of the plants, a little pubeſcent; branches numerous, ſtiff, angular. *Leaves* alternate, or two together, or oppoſite to the young branches, lanceolate-egg-ſhaped, or acuminate, with yellowiſh nerves underneath, on ſhort petioles. *Flowers* ſmall, white, or yellowiſh, placed a little above the axils of the leaves; peduncle long, almoſt ſtraight, thread-ſhaped, thickened at the top when the fruit ripens, as in all the other ſpecies; calyx almoſt truncate, with five very ſhort teeth; ſegments of the corolla almoſt lanceolate, acute, ſpreading. *Fruit* oblong, obtuſe, the form and ſize of a ſmall olive, reddiſh yellow. A native of the Indies, and the iſle of Ceylon. 3. C. *ceraſiforme*, Lam. Illuſ. Willd. (Piper ſiliqua parva, J. Bauh. ii. p. 944, Icon.) " Stem inclining to ſhrubby; fruit nearly globular, ſolitary, erect." Nearly allied to the preceding. *Stem* ſmooth, a little quadrangular, branched. *Leaves* ſcattered, ſmooth, lanceolate, acuminate. *Flowers* yellowiſh white, on long peduncles; calyx ſhort, bell-ſhaped, truncate, very ſlightly toothed. *Fruit* about the ſize of a cherry, red or yellow. A native of Brazil. 4. C. *baccatum*, bird-pepper, Linn. Mant. (C. fruteſcens, β. Sp. Pl. C. fructu minimo, Brown. Jam. 176. C. minus fructu parvo, Sloane Jam. 112. Hiſt. tab. 146. *fig.* 2. β. C. minimum, Mil. n. 10?) " Stem inclining to ſhrubby, even; peduncles often in pairs; fruit very ſmall." *Stem* ſtriated, roundiſh, almoſt ſmooth; branches divaricated, zigzag. *Leaves* alternate, petioled, almoſt heart-ſhaped, acuminate, tender, ſmooth, nerved beneath. *Flowers* often in pairs, very ſmall, yellowiſh white; peduncles unequal, united at their baſe, ſtraight, pubeſcent; calyx ſhort, nearly ſmooth, with five awl-ſhaped teeth; ſegments of the corolla ſhort, obtuſe. *Fruit* globular, a little oval, ſcarcely larger than a pea, ſmooth, red or yellowiſh; peduncle ſtraight; Miller's minimum has leaves a little rounded at their ſummit, not acuminate. A native of the Indies. 5. C. *groſſum*, Linn. Mant. (C. fructu longo, per ſummum tetragono, Tour. Inſt. p. 152. C. tetragonum, Mil. n. 3?) " Stem inclining to ſhrubby; fruit erect, thickened, ſomewhat heart-ſhaped." *Stem* ſlightly pubeſcent, angular, compreſſed towards the ſummit. *Leaves* tender, alternate, lanceolate-egg-ſhaped, acute, ſcarcely longer than the petiole. *Flowers* almoſt axillary, ſolitary; peduncles ſtraight. *Fruit* bright red, globular, ſometimes a little angular, emarginate, nearly the ſize of an orange; peduncles a little curved. A native of the Indies. 6. C. *ſinenſe*, Lam. Willd. Jacq. Hort. iii. tab. 67. " Stem inclining to ſhrubby; peduncles either faſciculated or in pairs; fruit conical, very ſmall, pendulous." *Stem* ſmooth, ſtriated; branches numerous, zigzag, divaricated, angular. *Leaves* egg-ſhaped, rather large, ſharply acuminate; petioles a little pubeſcent, ſlender. *Flowers* yellowiſh white, either four or five together, or in pairs; peduncles an inch long, curved near the top; ſegments of the corolla obtuſe. *Fruit* ſmall, egg-ſhaped, terminated by the permanent piſtil, yellowiſh. A native of China. 7. C. *conicum*, Lam. Ill. (C. conoides, Mil.) " Stem inclining to ſhrubby; fruit egg-ſhaped-conical, erect." Diſtinguiſhed from ſome of the preceding chiefly by its fruit, which is about half an inch long, bright red, a little bellying at its baſe, narrowed at the ſummit into an obtuſe cone, and generally ſtanding upright on a curved peduncle. A native of the Indies. 8. C. *luteum*, Lam. Illuſt. " Stem inclining to ſhrubby, zigzag; little branches and petioles hairy; fruit egg-ſhaped, pendulous, three-celled." *Stem* nearly quadrangular, pubeſcent. *Leaves* tender, egg-ſhaped, acute, ſmooth. *Flowers* ſmall, whitiſh, ſolitary, or ſeveral together; diviſions of the corolla ſhort, acute. *Fruit* yellow, oblong, of a moderate ſize. Found in the Eaſt Indies by Sonnerat.

All the ſpecies of capſicum have the ſame general qualities, which are ſenſible in every part of the plant. The fruit is much uſed for culinary purpoſes in its native countries, and has long ſince been introduced into Europe as a poignant ingredient in ſoups and high-ſeaſoned diſhes. Its taſte is extremely acrimonious, and leaves a durable ſenſation of heat on the palate. When taken in ſmall quantities it is a grateful ſtimulant; but if uſed to exceſs, it has a painful effect, and ſeems to ſet the mouth on fire. In hot climates, where only it is indigenous, a liberal uſe of it is found to be ſalutary in ſtengthening the ſtomach, aſſiſting digeſtion, and correcting that putreſcent colliquation of the humours which thoſe climates have a tendency to produce. The ſmaller kinds of the fruit are moſt in requeſt. The fruit of capſicum baccatum in particular, gathered when ripe, dried in the ſun, and then pounded and mixed with ſalt, is kept ſtopt in bottles, and known in the Weſt Indies by the name of Cayenne butter. Pepper-pot, according to Miller, is made of the ſame ſpecies, or of that variety of it which he calls *minimum*. For this purpoſe the ripe fruit is firſt dried in the ſun, then put into an earthen or ſtone pot, with a layer of flour between each layer of fruit, and baked in an oven till it is perfectly dried. It is then cleaned from the flour, and beaten or ground to fine powder. To every ounce of this powder, a pound of wheat flour is added, and the mixture made into ſmall cakes with leaven: theſe are baked, cut into ſmall pieces, and baked again till they are as hard as biſcuit, then beaten into powder and ſifted. The reſult is the well known Cayenne pepper. Capſicum groſſum is moſt proper for pickling, the ſkin being more fleſhy and tender than in the other ſpecies. The fruit ſhould be gathered before it comes to its full ſize, ſhould be ſlit down on one ſide to get out the ſeeds, and ſoaked two or three days in ſalt and water. After it is well drained, it ſhould be covered with boiling vinegar, and cloſely ſtopped down for two months. It ſhould finally be boiled in vinegar to make it green, and will want no addition of ſpice. If the ripe fruit of any of the ſpecies be thrown into the fire, it produces a noiſome vapour which occaſions vehement ſneezing and coughing, and ſometimes vomiting. The powder taken up the noſe will cauſe violent and dangerous fits of ſneezing. Cayenne pepper, though its powerful properties have been ſo long known, has but lately been introduced as a medicine. It is now uſed both externally and internally to promote excitement, where the bodily organs are languid and torpid, and according to Dr. Woodville, as an aromatic of the moſt acrid and ſtimulating kind, may certainly be found efficacious in ſome paralytic and gouty caſes. The French authors of Demonſtrations de Botanique, ſtate it to be a powerful ſtomachic, and aſſert that ſix grains in powder mixed with honey, taken every morning, is a true ſpecific for hypochondriacal diſorders, and thoſe head-aches which proceed from a relaxed ſtomach. It has been ſucceſsfully exhibited in cynanche maligna, and in what Dr. Mackitrick calls *cachexia Africana*, which he conſiders as the moſt frequent and fatal prediſpoſition to diſeaſe among negroes. The doſe he directs is from ſix to eight grains. Bergius gave the ſeeds of capſicum with great ſucceſs in inveterate intermittents.

The annual capſicum, which is the moſt hardy, is cultivated in Spain, Portugal, and the ſouth of France, in the open air, for the ſake of its fruit, which, particularly in Languedoc and Provence, is eaten green by the peaſants at their breakfaſt, and preferred to onions or garlick. In that ſtate it is alſo pickled and uſed inſtead of capers. The ripe fruit is employed in various articles of cookery. In England the different ſpecies are cultivated chiefly for ornament, and their beauty depends in a great degree on the various and brilliant colours of the ripe fruit, which, intermixed with the green leaves and white flowers, all flouriſhing at the ſame time, makes a pleaſing appearance in the green-houſe, or the borders of the flower garden. The hardier annual ſpecies or varieties are propagated by ſeeds, which muſt be ſown upon a hot-bed in the ſpring, and when the plants have ſix leaves, they ſhould be tranſplanted into another hot bed at the diſtance of four or five inches from each other, and in warm weather ſhould be allowed a good deal of freſh air. Towards the end of May, they ſhould be hardened by degrees to bear the open air, and in June may be tranſplanted into borders of rich earth. They will flower about the end of June, and will ripen their fruit in autumn. The perennial ſhrubby ſorts, after they have been brought forward in the hot-bed, as before directed for the annual ones, ſhould be planted ſingly in pots filled with rich earth, and plunged into a very moderate hot-bed, under a deep frame, where they may have room to advance. In the day-time, in warm weather, they ſhould have plenty of air, but muſt be covered with glaſſes every night, and ſhould be frequently watered. On the firſt approach of froſt, they muſt be removed into the ſtove, where they may have a temperate warmth. The fruit will continue in beauty moſt part of the winter.

CAPSIZE, *to*, in *Naval Language*, to upſet, or turn over any thing.

CAP-SQUARE, in *Artillery*, a ſtrong plate, generally of iron, which goes over the trunnion hole in each cheek of a gun-carriage, and is there curved or bent upwards into an arc, ſometimes of about 120°, but generally into a ſemicircular one nearly ſo as to form with the ſaid hole, (that is ſometimes let down into the cheek about two thirds of the diameter of the trunnion, but moſt commonly ſo as to have its centre about a quarter of an inch only below the upper ſurface of the cheek) a circle capable of receiving the ſame. It is faſtened to the priſe-plate by a hinge in the joint-bolt, by means of which, it is raiſed up or let down when wanted. The cap-ſquares, when faſtened down by means of the eye-bolts, or fore locks and keys, keep the trunnions in their holes and the guns on their carriages. There are two of them on every gun-carriage, viz. one on each cheek.

CAPSTAN, a large maſſy column ſhaped like a truncated cone, and paſſing perpendicularly through the deck of a ſhip, and turned by levers, or bars, which paſs through holes pierced in its upper extremity; ſerving, by means of a cable which winds round the barrel, to draw up burdens faſtened to the end of the cable. By the capſtan veſſels are drawn aſhore, and hoiſted up to be refitted; anchors weighed, and ſails hoiſted, cargoes diſcharged or taken in, &c.

The word is alſo written *capſtand*, *capſtern*, and even *capſtow*. It is formed from the French *cabeſtan*, which ſignifies the ſame.

The power of the capſtan is reducible to that of the AXIS *in peritrochio*.

The common moveable capſtan is exhibited in *Plate* III. *Mechanics*, *fig*. 15. A is the ſhaft, into the top of which four handſpikes, B, C, D, E, are put, for the men to turn by: this ſhaft paſſes through a collar at G, and works in a hole in the piece H; at F the rope is paſſed twice round the barrel, and to keep it from ſlipping when the barrel is turned, a man conſtantly pulls at the end or part J: this machine is prevented from moving by ſtakes, K, K, driven into the ground. Sometimes, inſtead of uſing the common barrel, AF, *fig*. 15, a double one, *fig*. 16, is uſed. A, B are the two barrels, the one A being ſmaller than the other; CC is the running rope, one end of which is faſtened to the barrel B, and the other to the barrel A; in ſuch a manner, that when the ſhaft is turned, by means of the bar, CD, one barrel will wind on the rope, and the other will wind it off; the middle of the rope goes round a pulley, D, which is hooked to the great rope E. When the machine is turned, ſo that the great barrel B winds on the rope C, and the little one A at the ſame time winds it off, it is plain that the great one takes up more rope than the other can ſupply, and it muſt therefore draw forwards the rope E; and if the two barrels are nearly of a ſize, the pulley D will advance very ſlowly, and with proportionally great power.

This capſtan might eaſily be converted into a crane, or windlaſs, for raiſing weights, merely by giving the compound barrel, AB, an horizontal poſition, and ſubſtituting a winch inſtead of the bar, CD. See CRANE. Dr. Robinſon aſcribes the invention of this kind of capſtan to an uninſtructed but ingenious country tradeſman. Encyclop. Brit. Suppl. art. Machinery, vol. xx. p. 107. It appears, however, ſays Mr. Brewſter, in his late edition of "Ferguſon's Lectures on ſelect Subjects," (vol. ii. p. 377.) to be the invention of the celebrated George Eckhardt, and likewiſe of Mr. Robert M'Kean of Philadelphia, ſon to the preſent governor of Pennſylvania.

*Fig*. 17 repreſents the capſtan uſed at the London docks for hauling the ſhips in and out of the entrance-locks. AB is a caſt-iron ſhaft, the lower end B of which works in a hole or ſocket in the bottom of a well; at A it moves in a collar in a caſt-iron plate fixed over the top of the well, and which acts as a cover thereto: by having theſe two centres at a conſiderable diſtance from each other, the capſtan works very ſteadily. At the upper end of this ſhaft is a caſt iron wheel, E, whoſe four ſpokes are hollow to receive the handſpikes by which it is turned; F is the conical barrel on which the rope is wound.

There are commonly two capſtans in a ſhip of war; the *main-capſtan* placed behind the main-maſt, ſtanding on the firſt deck, and reaching four or five feet above the ſecond: this is alſo called the *double-capſtan*, becauſe it has two drum-heads, and ſerves two decks for drawing of anchors; and becauſe its force may be doubled by applying hands on each deck. It has bars, whelps, &c. for turning and ſtopping it. See *Plate* III. *Mechanics*, *fig*. 18. The other is the *jeer-capſtan*, or *little-capſtan*: this ſtands on the ſecond deck, between the main-maſt and the mizen: its uſe is, chiefly, to heave upon the jeer-rope, or to heave upon the viol, to hold off by when the anchor is weighed; and on other occaſions where a leſs force is required, than to weigh the anchors, &c. See *fig*. 19.

The French call that an *Engliſh capſtan* where there are only half-bars uſed: and which, for that reaſon, is only half perforated: this is thicker than the others.

There is alſo a *flying capſtan*, which may be moved from place to place.

The parts of a capſtan are, the foot *d*, which is the loweſt part; the ſpindle *f*, the ſmalleſt part of which turns round in an iron ſocket, called the ſaucer; the whelps, *b*, a ſort of brackets ſet into the body of the capſtan cloſe under the bars, and reaching downwards from the lower part of the drum-head to the deck; the barrel A, the main body of the whole; the drum-head *c*, which is a broad cylindric piece of wood fixed above the barrel and whelps, in which are the holes for the bars to be put into; the bars, which are ſmall pieces of timber by which the men heave; the pins, as *e*, which are little bolts of iron, thruſt perpendicularly through the holes of the drum-head, and through a correſpondent hole in the end of the bar, made to receive them when the bars are fixed; the pawls, which are pieces of iron bolted to one end of the beams of the deck, cloſe to the body of the capſtan, but ſo as that it have liberty to turn about every way; and againſt them do the whelps of the capſtan bear; ſo as that by them the capſtan may be ſtopped from turning back. There are alſo hanging pawls, as *g*, *g*, *fig*. 18, which reach from the deck above to the drum-head immediately beneath it; and laſtly, the ſwifter, which is a rope paſſed horizontally through holes in the outer ends of the bars and drawn tight, deſigned to keep the men ſteady whilſt they work, and to afford room for a greater number to work at once.

An important improvement has lately been propoſed to the capſtan by capt. Hamilton of the royal navy, which is that of reducing the number of whelps from ſix to five, making the lower part more obtuſe, and filling it up circular by the chocks, and alſo making the upper part more perpendicular in the ſides, and open, the whelps being a portion of a circle.

Several improvements in the ſtructure of the capſtan were propoſed to the Academy of Sciences at Paris, in conſequence of the prize offered by the Academy from the year 1739 to 1741. Seven memoirs on this ſubject were publiſhed in the 5th volume of the prize pieces, forming a detail of 296 pages in 4to. The laſt improvement was ſuggeſted by Stephen-Charles de la Lande, formerly profeſſor of mathematics in the military ſchool. A report on this ſubject was made to the "Bureau de Conſultation" in 1794. The method which he propoſes for obviating the inconvenience to which the common capſtan is ſubject, when different rounds of rope are coiled about the barrel, by means of a ſcrew or ſpiral placed round the capſtan, is particularly deſcribed in the ſupplement to Montucla's "Hiſt. de Mathematiques," vol. iv. p. 585—588.

In *fig.* 20. are ſhewn Mr. Plucknett's patent additions to a capſtan, which ſave the time and trouble of ſurging the meſſenger, or rope, by which the cable is hauled in. A is a double circular inclined plane, cut in the deck under the capſtan. B, C, D, are lifters of caſt-iron, ſhewn in *fig.* 21, having a broad flat head, *a*, and a ſquare bar, *b*, with a wheel, *c*, in the bottom of it, which runs on the inclined plane, A, the ſquare part, *b*, *fig.* 2, works through the pawl-wheel, E, *fig.* 20. When the capſtan is turned, the lifters running on the inclined plane below, will move up and down; and when the rope has wound itſelf down to the bottom of the capſtan, they will puſh it up again, as ſhewn at B and C, *fig.* 20. Theſe capſtans are now in uſe in many ſhips of war, as well as merchant-men, and anſwer the purpoſe very well.

The terms belonging to the uſe of the capſtan are, *rig the capſtan*, i. e. fix the bars in their reſpective holes, thruſting in the pins in order to confine them; *heave the capſtan*, i. e. go round with it heaving on the bars; *ſurge the capſtan*; and *come up capſtan*, that is, ſlacken and let go the cable which you heave by; in a like ſenſe they alſo ſay, *launch out the capſtan*; *pawl the capſtan*, or fix the pawls to prevent it from recoiling during any interval or pauſe in heaving.

CAPSTAN-*bars*, the pieces of wood employed in heaving round the capſtan.

CAPSULA, or CAPSELLA, denotes a bag, pouch, or receptacle of divers kinds of things.

The word is a diminutive of the Latin *capſa*, literally ſignifying a little box, or caſe; particularly a bag, or ſatchel, wherein boys carry their books, &c. to ſchool.

CAPSULA, in *Chemiſtry*, is an earthen veſſel, in form of a pan; wherein things are frequently placed, that are to undergo very violent operations of the fire.

CAPSULA *Gliſſoni*, in *Anatomy*, is the anterior or right margin of the leſſer omentum, (omentum minus ſive gaſtrohepaticum) which contains ſeveral veſſels and nerves belonging to the liver and gall-bladder, connected and ſurrounded by cellular and adipoſe ſubſtance. For a further account of this part, ſee LIVER and PERITONEUM.

CAPSULA *Communis* of the vena portarum, is a covering of firm and compact cellular ſubſtance, ſurrounding the trunk of the vena potarum, and attending its ramifications throughout the liver, where it includes alſo the concomitant branches of the hepatic artery and ductus hepaticus. See LIVER.

CAPSULÆ *Atrabiliariæ*, or renales, the glandular bodies which are ſituated above the kidneys, and which are alſo deſcribed under the names of glandulæ renales, or ſupra renales, and renes ſuccenturiati. See KIDNEY.

CAPSULE, in *Botany*, (capſula, Lat. a little box) according to Linnæus is a hollow pericarp, or ſeed-veſſel, which opens ſpontaneouſly in a determinate manner, but differently in different plants, to afford a paſſage for the ripened ſeeds. Gærtner in his excellent work, "De Fructibus et Seminibus Plantarum," uſes the term in a more extenſive ſenſe, and ſtates it to be a dry conceptacle, either membranous, coriaceous, or woody, ſometimes without valves, but much more frequently opening by the means of valves, which differ from each other in number, ſituation, and figure. He divides it into four ſpecies; utricle, ſamara, follicle, and capſule in the ſtricteſt ſenſe of the word. To paſs over the evident want of logical preciſion in giving the ſame name to a whole, and to one of its parts in contradiſtinction to the reſt, the firſt two, not opening ſpontaneouſly, may be much more advantageouſly conſidered as diſtinct kinds of pericarp. See thoſe words. The follicle of Gærtner correſponds with that of Linnæus in his Syſtema Naturæ, and practical works. He had called it conceptacle in the Philoſophia Botanica, and uniformly ſeparates it from the capſule: but as it poſſeſſes all the characters expreſſed in his definition of a capſule, it would doubtleſs be more proper to treat it as a particular modification of that kind of ſeed-veſſel. See FOLLICLE.

Capſules differ from each other with reſpect to their number, the conſiſtence of their outward covering, their external form, their internal diviſion, and their mode of dehiſcence, or opening.

1. With reſpect to their number, they are either ſingle, as in lychnis, papaver, and the greateſt number of plants; or more than one in the ſame ſimple flower; either completely ſeparate from each other, as in pæonia, caltha, and ſedum; or more or leſs united, towards the bottom, as in dictamnus, nearly in their whole length as in ſtaphylæa, or ſtill more intimately as in thoſe which are called coccous, or grained. The laſt are deſcribed by Linnæus and moſt other botaniſts as conſiſting of only one capſule; but ſince each of the cocci or grains has the ſame mode of dehiſcence as occurs in pæonia, dictamnus, and others which are univerſally deemed polycapſular, it ſeems more conſonant with nature to conſider them as diſtinct. Thoſe of ceanothus americanus are ſaid by Gærtner to ſeparate ſpontaneouſly from each other in a ſtate of maturity. It muſt be acknowledged, however, that when the various capſules of this kind are compared together, they are found gradually to recede from the polycapſular character, till at length they are ſo cloſely united, that it is not eaſy to draw a preciſe line of diſtinction between them and thoſe which are ſtrictly one.

2. With reſpect to the conſiſtence of their outward covering, they are membranous, as in oxalis; coriaceous, or reſembling leather, as in æſculus; fleſhy, or ſucculent, as in pontederia; or woody, as in bankſia and cedrela.

3. With reſpect to their external form, by far the greater number of capſules are roundiſh, or egg-ſhaped; but they are ſometimes globular, as in centunculus and hottonia; cylindrical, as in dianthus; inverſely heart-ſhaped, as in veronica; angular, as in campanula; trigonous, or three-ſided, as in polemonium; four ſided, as in parnaſſia; five-ſided, as in linum; three-furrowed, as in canna; three-lobed, as in crocus; and ſo paſſing gradually to the compound capſule,

which is didymous, or two-grained, as in mercurialis; three-grained, as in euphorbia; five-grained, as in ayenia.

4. With reſpect to their internal diviſion, they conſiſt of one or more cells, (loculamenta.) When there are two or more cells, the ſubſtance by which they are ſeparated is called the diſſepiment, or partition, and the central column, the columella. See thoſe words. Some of the cells frequently become abortive as the fruit ripens, and ſometimes entirely diſappear. The only method of determining their natural number with certainty is, to make a tranſverſe ſection of the germ at an earlier period of the flower.

5. With reſpect to their mode of dehiſcence, or opening, they are one, two, three, four, five, or many-valved. A capſule is ſaid to be one-valved when it does not ſeparate into diſtinct parts. Capſules of this kind open in various ways. 1. With lateral holes; about the middle, as in moſt ſpecies of campanula; near the baſe, as in trachelium; and near the ſummit, as in papaver. 2. With a ſingle longitudinal ſlit, or chink, (rima); extending but a little below the ſummit, as in ſtaphyllæa; to the middle, as in colchicum; and from the top almoſt to the bottom, as in butomus, caltha, and many others. This ſlit is generally on the inner or concave ſide; but is found on the outer or convex one in magnolia, ægicera, and a few more. 3. With a ſhort tranſverſe ſlit on the ſummit, as in oldenlandia and hedyctis. 4. With an entire round hole at the ſummit, as in jaſione and roella; or with three, as in antirrhinum orontium. 5. With ſhort teeth, as in ceraſtium; or with deeper diviſions, but not ſo low as the middle (bifariam, &c. dehiſcentes), as in dianthus and agroſtemma. If the diviſions deſcend to the middle of the capſule, it is ſaid to be ſemi-valved; and if ſtill lower down, whether they reach the baſe or not, it is called by Linnæus two or more-valved, according to their number; two-valved, as in circæa; three-valved, as in crocus and epilobium; four-valved, as in parnaſſia; five-valved, as in droſera, &c. Gærtner calls every longitudinal diviſion a valve, although it be only a minute tooth, which ſeems preferable to the arbitrary diſtinction made by Linnæus, without any eſſential difference; but it would, as we conceive, be ſtill better to give that name only to ſuch as extend to the baſe of the capſule. They open either from the top, as in epilobium, and moſt other genera; or from the baſe, as in circæa. Gærtner aſſerts, that this difference is of no importance: but however inconſiderable it may appear in the eye of the phyſiologiſt, it ought by no means to be paſſed over in ſilence by the diſcriminating and arranging botaniſt.

Capſules are more than one-valved: 1. When they ſplit longitudinally from the ſummit, or the baſe, into two or more diviſions: 2. When they ſplit longitudinally with more than one chink, leaving the ſummit and the baſe entire, as in oxalis, xyris, and many of the orchideæ: 3. When they divide tranſverſely into two ſegments, appearing as if they had been cut round, (circumſciſſæ); about the middle, as in anagallis; near the ſummit, as in hyoſcyamus; or a little above the baſe, as in trianthema.

**CAPSULE** of the cryſtalline lens, in *Anatomy*, a production of the membrana hyaloidea, which ſurrounds the cryſtalline humour, and retains it in its ſituation. See EYE, *Anatomy of*.

**CAPSULATE PLANTS**, CAPSULATÆ *plantæ*, are ſuch as have a tetrapetalous regular flower, conſiſting of four diſtinct petala in each flower, and which bear their ſeeds in ſhort *capſulæ*: by which they are diſtinguiſhed from the *ſiliquoſæ*, which have their ſeed in long caſes, or pods.

**CAPTAIN**, in French, *capitaine*. This word, in its ordinary acceptation, ſignifies an officer who commands a company, whether it be a troop of cavalry or a company of infantry or artillery. This word had formerly a much more general meaning than it has at preſent. For it denoted the commander in chief of an army or body of troops. And in this ſenſe we ſtill make uſe of it when we ſay, that Anſlear, Annibal, Scipio, Cæſar, Turenne, Conde, Marlborough, Eugene, &c. were great captains. It was the name firſt given to the chief, head, or commander of a troop, company, or any other body of men by land or ſea.

A captain uſed to be a very conſiderable officer, and had the command of a thouſand, ſometimes of four thouſand, and ſometimes of a greater number of men.

From the time of Louis XII. to that of Henry IV. perſons moſt diſtinguiſhed for their conduct in the French armies were called captains.

In the legions of ſix thouſand men each, that were inſtituted by Francis I. every captain commanded one thouſand men, who were divided into ten centuries, commanded each by an officer who had not the name of captain, but that of centenier or centurion.

There have been inſtances in France of officers commanding corps from four to ſix thouſand men under the ſole title of captain. But theſe large bodies ſo commanded were compoſed of ſtrangers or foreigners, as Scots, Germans, Swiſs, Italians, whom gentlemen of theſe nations brought into the ſervice of the French kings, a practice that continued even under Louis XIII.

In the moſt remote times of the ancient French militia the name of captain was not given to their officers except the generals. Thoſe, who commanded under the dukes and counts were the viguers and the centeniers, during the firſt and ſecond races of their kings.

But when their ſovereigns, beſides employing the troops of their vaſſals, gave commiſſions to certain ſeigniors to raiſe companies of gens d'armes, theſe ſeigniors took the title of captain in the ſenſe annexed to it at preſent. In the buſineſs of war, this appellation indeed has always denoted a commandant or chief of troops or ſoldiers. In the old French romances that of *chevetaine*, which comes from the word chef or chief, is ſometimes made uſe of. And captain comes from *caput*, which alſo ſignifies chief.

The rank of captain, in the ordinary acceptation of the word is between that of a major and that of a lieutenant. A captain commandant is he who commands in chief a company or has the chief command of a company.

In every nation almoſt, and in every ſervice, there are captains of different denominations by the addition of other words expreſſive of the functions or duties of thoſe, on whom the compounded appellations are beſtowed.

We for inſtance make uſe of the compound term *Captain General.* By the conſtitution the king is captain general or generaliſſimo of all the forces in his united kingdoms of Great Britain and Ireland and their dependencies. The term comprehends the firſt military rank, power, and authority in the realm. In 1799 his majeſty was pleaſed to delegate this rank with the powers and authorities annexed to it to his royal highneſs the duke of York.

*Captain Lieutenant.* This compound term in our ſervice denotes the commanding officer of the colonel's troop or company in every regiment, when the colonel is either abſent or gives up the command of it to him. By an order in 1772 this officer takes rank as a full captain, and by a late regulation he ſucceeds to the firſt vacant troop or company, the price of a captain-lieutenantcy and of a company being now the ſame. The title of captain-lieutenant is ſtill made uſe of in foreign countries.

A *captain reformed* is one, who on a reduction of the army at the termination of a war and the re-eſtabliſhment of peace, loſes his company but retains his rank and pay, whether he be on duty or not.

A *captain on half pay* is one who loſes his company on a reduction of an army and retires on half pay, until ſeniority or a call for his ſervices, puts him again on duty and full pay.

A *captain en ſecond*, or ſecond captain, is one, whoſe company has been broken up, and who is joined to another to ſerve under the captain of it, during whoſe abſence, through ſickneſs or otherwiſe, he commands.

The French, by annexing others to the word captain, multiplied the compound denominations of this title to a great degree. Of theſe the following are the principal:

Capitaine general.
Capitaine lieutenant.
Capitaine en ſecond.
Capitaines des portes.
Capitaine réformé.
Capitaine conducteur general d'artillerie.
Capitaine des guides.
Capitaine des charrois.
Capitaine général des charrois de l'artillerie.
Capitaine général des vivres.
Capitaine des mulets.
Capitaine des ouvriers.
Capitaine conducteur d'artillerie.
Capitaine de mineurs.
Capitaine en pied.
Capitaine en pied ſur un vaiſſeau de guerre.
Capitaine de port.
Capitaine d'armes.
Capitaine des gardes du corps du roi.
Capitaine des cent gardes Suiſſes du roi.
Capitaine des gardes de la porte du roi.
Capitaine des gardes de la prévoté de l'hotel du roi.
Capitaine des gendarmes de la garde du roi.
Capitaine des chevaux legers de la garde du roi.
Capitaine aux gardes Françoiſes.
Capitaines en ſecond aux gardes Françoiſes.
Capitaines aux gardes Suiſſes.
Capitaines dans la gendarmerie de France.
Capitaines des gardes du corps du Monſieur frère du roi.
Capitaine des Suiſſes de la garde ordinaire du corps de Monſieur frère du roi.
Capitaines des gardes du corps de Monſeigneur le comte d'Artois frère du roi.
Capitaine des Suiſſes de la garde ordinaire de Monſeigneur le comte d'Artois frère du roi.
Capitaines commandants d'infanterie Françoiſe.
Capitaines commandants des grenadiers.
Capitaines commandants de chaſſeurs.
Capitaines a la ſuite des regiments de l'infanterie.
Capitaines a la ſuite de l'infanterie.
Capitaines a la ſuite des places.
Capitaines dans le regiment Suiſſes.
Capitaines commandants dans les regiments Allemands.
Capitaines commandants dans les regiments Irlandois.
Capitaines commandants dans les regiments Italiens.
Capitaines commandants dans les regiments Corſes.
Capitaine des grenadiers royaux.
Capitaines dans les regiments provinceaux d'artillerie.
Capitaines dans les regiments provinceaux d'etat major.
Capitaines dans les bataillons d'etat major.
Capitaines commandants dans la cavalerie.
Capitaines a la ſuite d'un regiment de cavalerie.
Capitaines a la ſuite de la cavalerie.
Capitaines de cavalerie a la ſuite des places.
Capitaines commandants de carabiniers.
Capitaines attachés au corps des carabiniers.
Capitaines commandants de chevaux legers.
Capitaines commandants de houſſards.
Capitaines a la ſuite des houſſards.
Capitaines commandants de dragons.
Capitaines de dragons a la ſuite d'un regiment.
Capitaines a la ſuite des dragons.
Captaines de dragons a la ſuite des places.
Capitaines commandants de chaſſeurs a cheval.
Capitaines dans le corps du genie.
Capitaine commandant la compagnie des cadets gentils hommes dans l'ecole militaire.

There are alſo captains of ſeveral different denominations in their corps of artillery.

Since the revolution in France ſome of theſe denominations have ceaſed, and ſome of them have been changed into others. It is not therefore our intention to give a deſcription of each of them. We will only take notice of ſome of the principal ones, and then ſpeak of the knowledge and qualifications which captains ought to poſſeſs.

The title of *captain general*, or *capitaine general*, is very ancient in France, and conferred an almoſt unlimited command on the perſon who poſſeſſed it, in the diſtrict where he commanded. But it never correſponded to that of generaliſſimo or extended to the whole French army but in the caſe of the duke of Savoy in 1635, in the time of Louis XIII. This title was revived by cardinal Mazarin in 1656 in favour of the marquis de Caſtlemont and the marquis d'Uxelles, but not with ſuch extenſive powers. For they were under the orders of the marſhal of France, and it only in fact gave the command of all lieutenant generals. It was alſo conferred on others, as Meſſieurs de Crequi, d'Humieres, de Belleſons, and de Gadagni. But it did not continue long in exiſtence. The count de Teſſé alſo had the title of captain general in Italy in 1702.

In Spain the rank of a captain general correſponds with that of a marſhal of France, who has the command of an army.

Capitaine conducteur general d'artillerie, or captain-conductor general of artillery, is the perſon who commands all the captain conductors of artillery. He has charge of the equipages and takes care that they are properly arranged and march according to the orders of the general officer of artillery, which are tranſmitted to him by the commandants of the equipages of artillery.

Capitaine general des charrois de l'artillerie, the captain general of artillery-carriages, or the captain general of the carriage of artillery. This perſon ought always to be a man of much experience as well as of a naturally good and correct underſtanding with a clear arrangement of ideas. He has the command and direction of the whole carriage of the artillery.

Capitaine des guides, or captain of the guides, is the perſon charged with the aſſembling, chooſing, forming and furniſhing of guides. He ought to underſtand different languages, and particularly that of the country, in which the army is carrying on its operations. He ſhould be active, vigilant, and intelligent, practiſed in interrogating the guides he aſſembles, expert in diſcovering which of them are beſt acquainted with ſuch or ſuch a diſtrict or tract of country, in which of them he can place moſt confidence, and who amongſt them are fitteſt to be employed as ſpies. As the army advances he diſmiſſes thoſe that are found to be uſeleſs and chooſes others. He furniſhes ſome of them on foot and ſome mounted, and for this purpoſe procures both proviſions and horſes with forage from places in the neighbourhood of the army.

He encamps near the general's quarters, and when the general mounts on horſeback to reconnoitre, he accompanies him with the moſt intelligent of the guides.

### *Of the knowledge which it is neceſſary for captains to poſſeſs.*

That an officer of this rank ought to be well acquainted with every thing neceſſary for the proper diſcharge of the duties incident to his command or ſituation either in peace or war, in garriſon or in the field, is a poſition, too obvious to be diſputed, and requires no proof.

A captain then ought to underſtand the languages moſt generally ſpoken in Europe, and particularly that of the country with which the nation he belongs to is moſt frequently at war.

He ſhould be acquainted with geography in general, and more eſpecially with that of the country or countries in which his nation is carrying on war. He ſhould know the directions and extent of the principal hills and mountains in them, the courſes of the principal rivers, their depth and fording places, how far they are navigable by ſmall veſſels, by row-boats, or by canoes, the ſituations of the principal roads, bridges, defiles, fortified places, &c. &c. in them.

He ought to be well verſed in hiſtory, particularly that of his own country; and ſhould not only be acquainted with the beſt and moſt faithful accounts or narratives of battles, both ancient and modern, but ought to examine attentively and minutely the circumſtances mentioned as attending each of them, and contributing chiefly to its failure or ſucceſs. Such a courſe of ſtudy and reflection will ſoon enable him to acquire a knowledge of military management, reſources, and expedients, greatly beyond that which his own experience might ever afford him. When placed in an unuſual or trying ſituation, he will find in it ſomething ſimilar or unlike to what he had before read or thought of, which reſemblance or diſſimilitude will immediately ſuggeſt to him expedients, and means of extricating himſelf from difficulties. It is by ſuch a judicious, careful, and attentive peruſal of hiſtory that both the ableſt generals and ſtateſmen have been formed. For no man's experience alone, without the aid of ſtudy and reflection, is ſufficient to make a man eminent in any profeſſion.

A captain ought to be well acquainted, not only with the tactics, the manœuvres, the rules, and military regulations in the ſervice of his own country, but alſo with the different branches of the art of war, and to extend his ideas and knowledge beyond the parade or a review. Regulations, in time of peace, deliver general principles; but they do not point out the happy application of them; which on ſervice depends on the judicious regulations of military maxims by circumſtances. He ought to underſtand what ſort of works are beſt adapted to any particular ſituation or poſition; their form and deſtination; the manner of tracing or conſtructing them; the materials neceſſary for reveting them; the tools and utenſils wanted for erecting them; and in ſhort every branch of knowledge requiſite for ſecuring or fortifying any given poſition properly. He ſhould likewiſe underſtand the method of increaſing the ſtrength of any poſt by means of inundations, mines, paliſades, abattis, advanced works, lines of counter-approach, &c. &c. He ſhould know well how to defend an open city, town or village, a houſe, a church, an old caſtle, a church-yard, a barn, a farm-houſe, a block-houſe, a paſs or defile, a dike, a ravine, the paſſage of a river, a ford, a wood, &c.

A captain ought alſo to make himſelf well acquainted with the buſineſs and duty of an officer commanding an advanced guard, an outpoſt, a foraging party, and every other ſort of detachment.

A captain ſhould likewiſe underſtand mathematics to at leaſt a certain extent or degree. He ſhould know the uſe of mathematical inſtruments and poſſeſs a ſufficient knowledge of geometry for ſurveying and the meaſurement of heights and diſtances. He ought alſo to underſtand algebra, as far, at leaſt, as quadratic equations.

A captain ſhould alſo know how to ſketch ground expeditiouſly, and to repreſent properly on paper the relative ſituations of hills, riſing grounds, towns, villages, ravines, highways, and other roads, as well as the relative heights nearly of the different poſitions. But a knowledge that is merely confined to this, though it be neceſſary as an elementary part of inſtruction, is of but little value, and is calculated for rendering an officer vain and conceited, and for making him ſuppoſe that he knows every thing, whilſt in reality he knows ſcarce any thing that he ought to know. He ſhould be able to determine ſpeedily whether one poſition be preferable to another, either for the reception of troops, or for the purpoſes of defence. He ſhould know how to combine caſtles, houſes, churches, church yards, dikes, fences, copſes, woods, high-ways, &c. with field-works. He ought to underſtand the beſt methods of conſtructing ſuch works, as well as the proper application of artillery to the attack and defence of field-poſitions. The doctrine of poſitions, and the combinations of attack and defence, form indeed the ſublimeſt part of the art of war.

A captain, and indeed every other officer of engineers, ought to be thoroughly acquainted with fortification, the principles of conſtruction both regular and irregular, of the attack and defence both of fortified places and field-poſitions, the theory of revetements and demi-revetements, the conſtruction of batteries, &c. &c. independently of what they ſhould know in common with other officers.

A captain, or other officer of artillery, excluſive of what he ought to know in common with the reſt of the army, ſhould be thoroughly acquainted with a variety of things peculiar to the ſervice of his own corps. He ſhould underſtand, as well as any engineer whoſoever, the conſtruction of batteries; the ſituations and ſervices to which different ſorts of ordnance are beſt adapted; in what circumſtances it is better to make uſe of ſhells and hollow ſhot, than ſolid ones, and of howitzers and mortars, than cannon; the preparing and making up of ammunition; the charges beſt ſuited to various ſervices and ſituations; the practice of firing *en ricochet;* the windage fitteſt for different ſorts and pieces of ordnance; the theory of projectiles both in vacuo and in the air; the conſtruction of guns and gun-carriages; &c. &c.

As to the phyſical qualities or qualifications of captains, they ought to poſſeſs good conſtitutions, and to be capable of enduring the continuance of fatigue, which is of the firſt conſequence on actual ſervice. Troops without theſe qualities, let their arms and dreſs be ever ſo favourable for expedition, cannot make long and rapid marches, or perform their movements with celerity, which, *cæteris paribus*, will always enſure ſucceſs to the army, that poſſeſſes it in the greateſt degree. He ſhould alſo poſſeſs courage, or perſonal bravery, as well as coolneſs or ſteadineſs in every ſituation. He ought likewiſe to enjoy diſtinct viſion to prevent confuſion and miſtakes. For though Hannibal both fought and won ſome great and important battles after he loſt the ſight of one eye, every officer is not in point of talents, contrivance, and abilities, an Hannibal.

As to his moral qualities, he ought to be honourable, juſt, temperate, free from drunkenneſs, gambling, and every other ſpecies of debauchery and diſſipation, exemplary in his conduct, conciliating in his manners, not given to quarrelling, attentive to the comfort of his ſoldiers, obedient and reſpectful to his ſuperiors, mild and humane towards his inferiors, a preſerver of ſtrict diſcipline, and at the ſame time an enemy to ſevere and ignominious puniſhments.

CAPTAIN-*baſhaw*, ſignifies the Turkiſh high-admiral. See BASHAW.

He poſſeſſes the third office in the empire, and is inveſted with the ſame power at ſea that the vizir has on ſhore. Solyman II. inſtituted this office in favour of the famous Barbaroſſa; with abſolute authority over the officers of marine and arſenal, whom he may puniſh, caſhier, or put to death, as ſoon as he is without the Dardanelles. He commands in chief in all the maritime countries, cities, caſtles, &c. and at Conſtantinople is the firſt magiſtrate of police in the villages on the ſide of the Porte, and the canal of the Black Sea. The mark of his authority is a large Indian cane, which he carries in his hand, both in the arſenal and in the army.

The captain-baſhaw enjoys two ſorts of revenues; the one fixed and the other caſual. The firſt ariſes from a capitation of the iſlands of the Archipelago, and certain governments in Natolia and Gallipoli. The latter conſiſts in the pay of the men who die during the campaign; in the fifth of all prizes made by the begs; in the profits accruing from the labour of the ſlaves, whom he hires as rowers to the grand ſignior; and in the contribution he exacts in all places where he paſſes.

CAPTAIN *reis*, or CAPIDAN *reis*, an appellation given by the Turks to the grand pilot, anſwering to pilot royal among the French.

CAPTAIN, a title given to perſons commanding ſhips of war, carrying 20 guns or upwards. The commanders of ſhips in the ſervice of the Eaſt India company are alſo ſtyled captains; and the ſame title has deſcended, very improperly, to the maſters of other veſſels.

The charge of a captain in his majeſty's navy is very comprehenſive, inaſmuch as he is not only anſwerable for any bad conduct in the military government, navigation, and equipment of the ſhip he commands, but alſo for any neglect of duty, or ill management, in his inferior officers, whoſe ſeveral charges he is appointed to ſuperintend and regulate. On his firſt receiving information of the condition and quality of the ſhip he is appointed to command, he muſt attend her conſtantly, and haſten the neceſſary preparations to fit her for ſea. So ſtrict, indeed, are the injunctions laid on him by the lord high admiral, or commiſſioners of the admiralty, that he is forbid to lie out of his ſhip, from his arrival on board till the day of his diſcharge, unleſs by particular leave from the admiralty, or his commander in chief. He is enjoined to ſhew a laudable example of honour and virtue to the officers and men, and to diſcountenance all diſſolute, immoral, and diſorderly practices, and ſuch as are contrary to the rules of diſcipline and ſubordination, as well as to correct thoſe who are guilty of ſuch offences as are puniſhable according to the uſage of the ſea. He is ordered particularly to ſurvey all military ſtores which are ſent on board, and to return whatever is deemed unfit for ſervice. His diligence and application are required to procure his complement of men, obſerving carefully to enter only ſuch as are fit for the neceſſary duty, that the government may not be put to improper expence. When his ſhip is fully manned, he is expected to keep the eſtabliſhed number of men complete, and ſuperintend the muſter himſelf, if there is no clerk of the check at the port. When his ſhip is employed on a cruiſing ſtation, he is expected to keep the ſea the whole length of time previouſly appointed; but if he is compelled, by ſome unexpected accident, to return to port ſooner than the limited time, he ought to be very cautious in the choice of a good ſituation for anchoring, ordering the maſter, or other careful officer, to ſound and diſcover the depths of water and dangers of the coaſt. Previous to any poſſibility of an engagement with the enemy, he is to quarter the officers and men to the neceſſary ſtations, according to their office and abilities, and to exerciſe them in the management of the artillery, that they may be more expert in the time of battle. His ſtation, during the time of an engagement, is on the quarter-deck; at which time he is expected to take all opportunities of annoying his enemy, and improving every advantage over him, to exhibit an example of courage and fortitude to his officers and crew, and to place his ſhip oppoſite to his adverſary, in ſuch a ſituation, as that every cannon ſhall do effectual execution. At the time of his arrival in port, after his return from abroad, he is to aſſemble his officers, draw up a detail of the obſervations that have been made during the voyage, of the qualities of the ſhip, as to her trim, ballaſt, ſtowage, manner of ſailing, for the information and direction of thoſe who may ſucceed him in the command; and this account is to be ſigned by himſelf and officers, and to be returned to the reſident commiſſioner of the navy at the port where the ſhip is diſcharged, and to tranſmit a duplicate of the ſame to the navy board.

The pay of captains in the royal navy was formerly very ſmall; this defect was, however, made up by indulging them in many privileges not now allowed; as plundering of prizes, taking convoy-monies, and even carrying merchant goods, plate, &c. King James II. taking this laſt privilege away, in lieu thereof granted them an annual allowance of table-monies, almoſt equal to their whole former pay. But this not taking place, by reaſon of the abdication, king William III. in 1693, ordered the pay of captains to be doubled; but the fund for this failing at the peace of Ryſwick, a new eſtabliſhment was made in 1700, whereby nearly one-third was retrenched from the ſea-pay, and that of a firſt rate was fixed at 1l. of a ſecond rate at 16s. and a third rate at 13s. 6d. of a fourth rate at 10s. of a fifth rate at 8s. and of a ſixth rate at 6s. per day.

Captains of poſt ſhips, after three years from the date of their firſt commiſſion, rank as colonels in the army.

Admirals' ſhips, and thoſe of the firſt rate, in the French navy, have two captains, two lieutenants, and two enſigns.

CAPTAIN, or more properly, *maſter*, of a merchant ſhip, is the perſon who has the direction of the ſhip, crew, and lading, &c. The proprietor of the veſſel appoints the maſter, and the maſter engages his mate, crew, and pilots, &c.; though, when the proprietor and maſter reſide in or near the ſame place, they generally act in concert together. In the Mediterranean the maſter is called the *patron*, or *patroon*.

CAPTAIN, a title in the royal navy, given to thoſe perſons who have the charge or command of a gun, of the tops, &c.

CAPTAINS *of port*, in the French *Marine Affairs*, officers eſtabliſhed in ſome conſiderable ſea-ports where there are arſenals. To them belong the command of the guard of the place, the watching of the ſea, and the care and cuſtody of the veſſels brought into port.

There are ſuch captains at Toulon, Rochfort, Breſt, Havre, Dunkirk, and Port Lewis. They are to take care of mooring the king's ſhips, and oblige all to give the due ſalutes.

CAPTAIN's *Clerk*, a perſon employed by the captain to keep his accounts, &c. His pay is the ſame as that of a midſhipman. The captain is anſwerable for the faults of his clerk; nor can he receive his wages without proper certificates, and muſt make good all damages ſuſtained by his neglect or irregularity. By a recent regulation, no perſon can be a purſer unleſs he has ſerved two years as captain's clerk.

CAPTAINRY, *capitainerie*, in the French *Law*, denotes the government or command of a royal palace, and the lands dependent thereon.

The name is alſo applied to the office of captains of chaces or woods: ſuch are the capitainries of Fontainbleau, the wood of Boulogne, &c.

CAPTIAUX, in *Geography*, a town of France, in the department of the Gironde, and chief place of a canton in the diſtrict of Bazas; 3 leagues S. of Bazas. The place contains 1152, and the canton 3015, inhabitants; the territory comprehends 362½ kiliometres and 6 communes.

CAPTION, in *Law*, is that part of a legal inſtrument, as a "commiſſion," "indictment," &c. which ſhews where, when, and by what authority, it is taken, found, or executed. Thus, when a commiſſion is executed, the commiſſioners ſubſcribe their names to a certificate, declaring when and where the commiſſion was executed. The caption uſually commences with theſe words, *Virtute iſtius commiſſionis nos*, &c. or, *Executio iſtius commiſſionis patet in quadam ſchedula annexata*, &c. or *Capt. & cogn. die*, &c. or *Capt. fuit hæc reſponſ.* Captions of this kind relate chiefly to three ſorts of buſineſs; to commiſſions to take fines of lands, to take anſwers in chancery, and depoſitions of witneſſes.

Theſe captions, and the executions of the commiſſions, muſt now be in Engliſh, by 4 Geo. II. cap. 26.

The word *Caption*, is alſo uſed, vulgarly, for an arreſt.

Caption, in *Scots Law*, a writ iſſuing under his majeſty's ſignet, in his majeſty's name, obtained at the inſtance of a creditor in a civil debt, commanding meſſengers at arms, and other officers of the law, to apprehend and impriſon the perſon of the debtor until he pay the debt.—Alſo, the name of a writ iſſued by the court of ſeſſion againſt the agents of the court, to return papers belonging to proceſſes or law-ſuits, or otherwiſe to go to priſon.

CAPTIVE, a ſlave, or perſon taken by the enemy in war, or by a pirate or corſair. See Slave.

Captives, *captivi*, among the Romans, differed from *dedititii*, as the former were taken by force, whereas the latter ſurrendered themſelves.

By the *Lex Cornelia*, a Roman citizen taken captive, in caſe he returned, was reputed as having never been taken; if he died in captivity, he was reputed for dead the moment he was taken: in the former caſe he recovered all his right, and even the dominion over his children; in the latter his ſon became free from the time of his father's detention. Juſtin. Inſt. lib. i. tit. xii. § 5.

Formerly captives in war became the ſlaves of thoſe who took them; and though ſlavery, ſuch as obtained among the ancients, be now aboliſhed, ſome ſhadow of it ſtill ſubſiſts in reſpect of priſoners of war, who are reputed the property of their captors, and have no right to liberty, but by conceſſion from them, or till their ranſom is paid. Negro ſervants likewiſe, who are purchaſed when captives, continue in ſome degree the property of the maſters who buy them; though the property (if it indeed continues) conſiſt rather in the perpetual ſervice than in the body or perſon of the captive. Blackſt. Com. vol. ii. p. 402. See Negro and Slave.

The Romans uſed their captives with great ſeverity; their necks were expoſed to the ſoldiers to be trampled on, and their perſons afterwards ſold by public auction. Captives were frequently burnt in the funeral piles of the ancient warriors, as a ſacrifice to the infernal gods. See Burial. Thoſe of royal or noble blood had their heads ſhaven, and their hair ſent to Rome, to ſerve as decorations in female toys, &c. They were led in triumph loaden with chains through Rome, in the emperor's train, at leaſt as far as the foot of the Capitoline mount, for they were not permitted to aſcend the ſacred hill, but carried thence to priſon. Thoſe of the prime quality were honoured with golden chains on their hands as well as feet, and golden collars on their necks. If they made their eſcape, or killed themſelves to avoid the ignominy of being led in triumph, their images or effigies were frequently carried in their place."

CAPTIVITY is uſed in *Scripture* to denote the puniſhment inflicted by Providence on the Jews, for their idolatry and wickedneſs.

Their firſt captivity in Egypt, from which they were reſcued by Moſes, ſhould be conſidered rather as the reſult of providential diſpenſation than as a penal evil. See Exodus. The ſubſequent captivities of the Jewiſh people may be regarded as chaſtiſements of Providence for their relapſe into idolatry, and as means of reclaiming them to the acknowledgment and worſhip of the true God. The ſcripture hiſtory informs us of ſix captivities, which took place during the government by Judges. The *firſt* was that under Chuſhan-Riſhathaim, king of Meſopotamia, and continued eight years, from the year B.C. 1391 to 1383, when they were delivered by Othniel, the ſon of Kenaz, Caleb's younger brother. The *ſecond* was that under Eglon, king of Moab, and laſted 18 years, viz. from the year B.C. 1343 to 1325. From this they were reſcued by Ehud; and the eaſtern part of the country of Iſrael, after having been emancipated from the yoke of Moab, had reſt 80 years. However, in the mean while, the Philiſtines invaded the weſtern parts, and were repulſed by Shamgar. (Judg. iii. 31.) This is reckoned the *third* captivity. The *fourth* was that of the northern tribes by Jabin, king of Hazor, from which they were delivered by Deborah and Barak, in the year B.C. 1285; after which period the northern part of the territory of Iſrael had reſt 40 years. (Judg. iv. 2. v. 31.). The *fifth* captivity, comprehending north and eaſt Iſrael, was that under the Midianites, which laſted ſeven years, from the year B.C. 1245 to 1238; and from this the inſtrument of their deliverance was Gideon. (Judg. vi. 1, &c.) Their *ſixth* captivity was that under the Ammonites and Philiſtines. While Jair was judge over north and eaſt Iſrael (B.C. 1173), theſe diſtricts were in bondage to the Ammonites 18 years (Judg. x. 8.); and at the ſame time with Jair, Eli began to judge ſouth and weſt Iſrael 40 years, (1 Sam. iv. 18.), during which whole period that part of Iſrael was oppreſſed by the Philiſtines. (Judg. xiii. 1.). In the firſt of theſe 40 years of Eli, which was alſo the firſt year of Jair, Samſon was probably born; and he lived 40 years, judging weſt Iſrael (while Eli alſo was judge there, and while that part of the country was under the Philiſtines) 20 years. (Judg. xv. 20.). North and eaſt Iſrael were delivered from the Ammonites, after an oppreſſion of 22, or 21 complete years, in the year B.C. 1152. (Judg. x. 3.). The oppreſſion of the Philiſtines continued during the judicatures of Ibzan, Elon, Abdon, Eli, Samſon, and Samuel. Ibzan preſided over north and eaſt Iſrael five or ſix complete years, from the year B.C. 1147 to 1140 (Judg. xii. 7.), when he was ſucceeded by Elon. About the fifth year of Elon (B.C. 1155), Samuel was publicly known to be a prophet. (1 Sam. iii. 20. iv. 1.). About the ſeventh of Elon (B.C. 1133), Samſon pulled down the temple (Judg. xvi. 30.), and deſtroyed a great number of the Philiſtines. Uſher thinks that this calamity might encourage the ſouth and weſt Iſraelites to give them battle. (1 Sam. iv. 1.). Elon was ſucceeded in the judicature of north and eaſt Iſrael by Abdon, B. C. 1130; and Abdon by Samuel, B. C. 1122, who was now judge over north and eaſt Iſrael, as he had been before over ſouth and weſt Iſrael. (1 Sam. vii. 15, 16, 17.)

However, the moſt ſignal captivities which theſe people experienced, were thoſe of Iſrael and Judah, under the ſovereigns of theſe kingdoms, after they were ſeparated B. C. 975, denominated the *Aſſyrian* and *Babyloniſh*.

The *Aſſyrian* captivity, which comprehended that of the ten tribes, commenced in the reign of Pekah, king of Iſrael, B. C. 740, when Tiglath-Pilezer, king of Aſſyria, took ſeveral cities of Iſrael, and carried away captives, principally from the tribes of Reuben, Gad, and the half tribe of Manaſſeh. (1 Chron. v. 26. 2 Kings, xv. 29.). In the ſixth year of Hezekiah, king of Judah, and ninth year of Hoſhea, king of Iſrael, B. C. 721, Shalmaneſer, king of Aſſyria, took and deſtroyed Samaria, after a ſiege of three years, tranſplanted thoſe of the ten tribes, that had been ſpared by his father, Tiglath-Pilezer, to Nineveh, and provinces beyond the Euphrates, and thus diſperſed them among the Gentiles. (2 Kings, xviii. 10, 11.). Moreover, in the 22d year of Manaſſeh, king of Judah, B. C. 676, Eſarhaddon or Aſſaradinus, king of Aſſyria and Babylon, made the laſt deportation of the Iſraelites, and planted others in their ſtead; and in the ſame expedition, probably, took Manaſſeh captive, and carried him to Babylon. (2 Kings, xvii. 24. 2 Chron. xxxiii. 11. Ezra, iv. 2.). The Aſſyrian captivity of the ten tribes of Iſrael, ſometimes denominated Ephraim, from the chief of them, was predicted by Iſaiah (ſee chap. vii. 8.) in the firſt year of Ahaz, king of Judah, B. C. 741. "Within threeſcore and five years," ſays the prophet, "ſhall Ephraim be broken, that it be not a people." This period has very much puzzled the ſcripture critics. If this prophecy was delivered in the firſt year of Ahaz, and Shalmaneſer took Samaria, and carried away Iſrael (Ephraim) into Aſſyria, in the ſixth year of Hezekiah, we ſhall only have an interval of 21, inſtead of 65 years. For the ſolution of this difficulty, the learned Vitringa ſuppoſes that the text is corrupted, and that inſtead of 60 (שׁשׁים) and 5, it was originally written 16 (שׁשׁי) and 5. This conjecture would appear much more probable, if it could be proved, that it had ever been uſual to write the numbers or dates of years partly in words at length, and partly in numeral letters. But it is not neceſſary to recur to this expedient. For if we compute, from the firſt of Ahaz, 65 years in the reigns of Ahaz, Hezekiah, and Manaſſeh, they will terminate about the 22d year of Manaſſeh, when the captivity of the Iſraelites was completed by Eſarhaddon.

It has been generally ſuppoſed, that the greater part of the ten tribes was loſt in this captivity, which put a period to the kingdom of Iſrael. It is certain, that immediately upon their deportation, they were placed in Aſſyria and Media; and if they ſubſiſted any where, it is natural to imagine that they might be found there in the greateſt number. But authors have generally ſought for them elſewhere. Accordingly, the viſionary writer of the ſecond book of Eſdras (xiii. 40, &c.) affirms, that they adopted a reſolution of retiring from the Gentiles, and of emigrating into a country which had never been inhabited; that the Euphrates was miraculouſly divided for their paſſage; and that after purſuing their journey for a year and a half, they arrived at the country, Arſaxeth; a country the ſituation of which has not been duly aſcertained. See AFGHANS. Benjamin Tudela, a Jew of the 12th century, has aſſigned them a large and ſpacious country, with fine cities, in a ſituation that is altogether unknown. Eldad, another Jew, of the 13th century, has placed them in Ethiopia, and hath made the Saracens and 25 kingdoms tributary to them. Another Jewiſh writer, Peritſol of Ferrara, who lived in the 16th century, has allotted to them kingdoms in a country called Perricha, incloſed by unknown mountains, and bounded by Aſſyria, and likewiſe in the deſerts of Arabia, and even in the Eaſt Indies. Manaſſeh, a famous rabbi of the 17th century, and others, have aſſerted, that they paſſed into Tartary, and expelled the Scythians; and others again from Tartary have conveyed them to America. Moſt of theſe accounts are unfounded conjectures, and ſome of them are manifeſt forgeries of the Jews to aggrandiſe their own nation. However, ſome reſpectable modern writers imagine, that they have found exiſting traces of them in the northern parts of India, particularly among the AFGHANS. The difficulty of aſcertaining the habitations of the ten tribes, has induced others, among whom we may reckon Calmet, to maintain, that they returned into their own country, with the other two tribes, after the Babyloniſh captivity. To this purpoſe it is alleged, that their return was predicted. See Hoſea, xi. 11. Amos, ix. 14. Obadiah, 18. 20. Iſaiah, xi. 13, 14. Ezekiel, xxxvii. 16. Jerem. xxxi. 7, 8, 9. 16, 17. 20. xvi. 15. xlix. 2. &c. Zech. ix. 13. x. 6. 10. Micah, ii. 12. Beſides, in the hiſtorical books of ſcripture, waving any reference to the apocryphal book of Tobit, Iſraelites, as well as thoſe of Judah and Benjamin, are reported to have returned from the captivity. When Ezra numbered thoſe that were returned from the captivity, he only inquired whether they were of the race of Iſrael; and at the firſt paſſover, then celebrated in the temple, there was a ſacrifice of "12 he-goats for the whole houſe of Iſrael, according to the number of the tribes." Ezra, vi. 16, 17. viii. 35. Under the Maccabees, and in the time of our Saviour, Paleſtine was peopled with Iſraelites of all the tribes, without diſcrimination. However, as the decree of Cyrus extended to "all the people of God" (Ezra, i. 3.), and that of Artaxerxes to "all the people of Iſrael" (vii. 13), there can be no doubt that many of the Iſraelites availed themſelves of theſe decrees, and returned with Zerubbabel and Ezra to their own cities; nevertheleſs, the main body of the ten tribes remained behind. Accordingly, Ezra, upon whoſe authority we may depend, informs us, that there "roſe up the chief of the fathers of Judah and Benjamin" (ch. i. 5.), and he calls the Samaritans "the adverſaries of Judah and Benjamin" (ch. iv. 1.); and hence we may infer, that theſe two tribes were the principals, and that the others were only acceſſories. And if they did not return at this time, they cannot be ſuppoſed to have returned, at leaſt in a conſiderable body, at any future time; for hiſtory informs us of no ſuch adventure, nor do we know either the time or occaſion of their return, or who were their conductors in this expedition. Joſephus, who ſaw his country for ſeveral years in as flouriſhing a condition as any time ſince the captivity, affirms (Antiq. lib. xi. cap. 5. §. 2.), that Ezra ſent a copy of the decree of Artaxerxes to all of the ſame nation throughout Media, where the ten tribes lived in captivity, and many of them came with their effects to Babylon, deſiring to return to Jeruſalem; but the main body of the Iſraelites abode in that region; and therefore it hath happened, ſays this Jewiſh hiſtorian, that there are two tribes in Aſia and Europe, living in ſubjection to the Romans; but the ten tribes are beyond the Euphrates to this time; and he then adds, with the vanity of a Jew, ſpeaking of his countrymen, that they were ſo many myriads, that they could not be numbered. Others, who have found no ſufficient authority for admitting that the ten tribes of Iſrael were reſtored in the ſame manner as the two tribes of Judah and Benjamin, have therefore aſſerted (ſee Prideaux's Conn. pt. I. b. I.) that the ten tribes of Iſrael, which had ſeparated from the houſe of David, were brought to a full and utter deſtruction, and never after recovered themſelves again. For thoſe who were thus carried away (excepting only ſome few, who joining themſelves to the Jews in the land of their captivity returned with them) ſoon falling into the uſages and idolatry of the nations among whom they were planted, to which, indeed, they were too much addicted while they remained in their own land, after a while became wholly abſorbed in them; and thence utterly loſing their name, their language, and their memorial, were never after any more mentioned. To this ſtatement, however, it has been very juſtly objected, that if the whole race of Iſrael became thus extinct, we ſhall in vain expect the fulfilment of the numerous prophecies, that promiſe the future converſion and reſtoration of Iſrael as well as of Judah. The truth, ſays biſhop Newton (Diſſertations on the Prophecies, apud Works, vol. vii. p. 195, &c. ed. 8vo.), ſeems to lie between theſe two opinions. "Neither did they all return to Jeruſalem, neither did all, who remained behind, comply with the idolatry of the Gentiles, among whom they lived. But whether they remained, or whether they returned, this prophecy of Iſaiah (ch. vii. 8.) was ſtill fulfilled; the kingdom, the commonwealth, the ſtate of Iſrael was utterly broken; they no longer ſubſiſted as a diſtinct people from Judah; they no longer maintained a ſeparate religion; they joined themſelves to the Jews from whom they had been unhappily divided; they loſt the name of Iſrael as a name of diſtinction, and were thenceforth all in common called Jews. It appears from the book of Eſther, that there were great numbers of Jews in all the 127 provinces of the kingdom of Ahaſuerus, or Artaxerxes Longimanus, king of Perſia, and they could not all be the remains of the two tribes of Judah and Benjamin, who had refuſed to return to Jeruſalem with their brethren; they muſt, many of them, have been the deſcendants of the ten tribes whom the kings of Aſſyria had carried away captive; but yet they are all ſpoken of as one and the ſame people, and all without diſtinction are denominated Jews." See alſo Acts, ii. 9. ch. xxvi. 7. James, i. 1. Without doubt, ſeveral perſons of all the ten tribes are now in being, though we cannot diſtinguiſh them from the other Jews, with whom they are confounded and intermixed.

It appears, therefore, to be a fact, that the ten tribes of Iſrael were in a manner loſt in their captivity, while the two tribes of Benjamin and Judah were reſtored and preſerved ſeveral ages afterwards. Should an inquiry be made into the reaſon of this difference, it may be alleged, that the ten tribes had totally revolted from God to the worſhip of the golden calves in Dan and Bethel; and for this, and their other idolatry and wickedneſs, they were ſuffered to remain in the land of their captivity.

The *Babyloniſh* captivity comprehended that of the kingdom of Judah, or of the two tribes of Judah and Benjamin, who adhered to the houſe of David, and laſted 70 years.

The mode of eſtimating its duration has been attended with ſome difficulty, on account of the different captivities of the Jewiſh nation, which occurred about the ſame period. Of theſe there have been reckoned five. The *firſt* happened in the fourth year of Jehoiakim, B. C. 606, when Nebuchadnezzar, admitted to partnerſhip with his father in the kingdom of Babylon, marched to Carchemiſh, with a great army, to recover from the king of Egypt all that he had lately conquered in Syria and Phœnicia. In the courſe of this expedition, he invaded and ravaged Judæa, beſieged and took Jeruſalem, made Jehoiakim his ſubject and tributary, tranſported the fineſt children of the royal family and of the nobility, and among the reſt Daniel and his companions, to Babylon, to be bred up there for eunuchs and ſlaves in his palace, and alſo carried away the veſſels of the houſe of the Lord, and put them in the temple of his god at Babylon. (Dan. i. 1, 6.) The *ſecond* captivity happened in the ſeventh year of Jehoiakim, B. C. 603, when Nebuchadnezzar, immediately after his father's death, returned to Judæa, made captives of many Jews, and bound their king in order to carry him to Babylon; though he reſtored him afterwards to his kingdom, having received the ſtrongeſt aſſurances of ſubjection and allegiance. Notwithſtanding theſe profeſſions of obedience, Jehoiakim again rebelled, in the 11th year of his reign, B. C. 599. Nebuchadnezzar, hearing of this revolt, came againſt him with a prodigious army, and threatened all Judæa with deſtruction. Intimidated by this menace, Jehoiakim ſurrendered himſelf into the hands of his enemy, who ſlew him, together with many of the nobles, in Jeruſalem, and placed his ſon upon the throne. (2 Chron. xxxvi. 6.) Afterwards repenting of what he had done, and fearing leſt Jehoiachin ſhould embrace ſome future occaſion of revenging his father's death, Nebuchadnezzar returned within three months, carried that unfortunate prince into captivity, and appointed Zedekiah to reign in his ſtead. (2 Chron. xxxvi. 9. 2 Kings, xxiv. 10, &c.) This may be reckoned the *third* captivity of the Jews by the king of Babylon. On this occaſion Mordecai and Ezekiel were among the captives. (Eſth. ii. 5, 6. Ezek. i. 1, 2.) The *fourth* was in the 11th year of Zedekiah, 588 B. C., when the whole land was made deſolate, when the city and temple of Jeruſalem were deſtroyed, (the city being taken and burnt after a ſiege of 18 months, in the year B. C. 587, and the temple burnt in the year B. C. 586.) and when Zedekiah, king of Judah, was bound with fetters of braſs, and carried priſoner to Babylon, where he died. (2 Kings, xxxv. 2, 9. 2 Chron. xxxvi. 10. Ezek. xii. 13.) The *fifth* captivity occurred in the 21ſt year of Nebuchadnezzar's reign, B. C. 584, when that monarch ſent Nabuzaradan, captain of his guard, to revenge the death of Gedaliah, governor of Judæa. Nabuzaradan deſolated the land, and carried to Babylon the wretched remains of that miſerable nation.

To each of theſe captivities the date of the period of 70 years has been referred. But the firſt of them, in the fourth year of Jehoiakim, B. C. 606, ſeems to be the moſt accurate commencement of this period, and alſo the moſt agreeable to Scripture. The interval, extending thence to the ſecond year of Cyrus, B. C. 536, when the Jews were permitted to return to their own land, amounts to 70 years; for Cyrus conquered Babylon towards the cloſe of the year, B. C. 538; ſo that the year following, viz. 537, was the firſt year of his reign, and 536 the ſecond, and the 71ſt from the fourth year of Jehoiakim. The date of the Babyloniſh captivity may be aſcertained, ſays Playfair, (Chronol. p. 45.) by the following facts. Nebuchadnezzar became maſter of Tyre in the 34th year of his reign, the 26th of Jehoiakim's captivity, and 573 B. C. (572 B. C. Blair) as we learn from the Tyrian annals. (Joſeph. cont. App. l. i. §. 21.) Cyrus took Babylon in the 14th year of Hiram, and 36th after it had been taken by Nebuchadnezzar, i. e. in the end of the year 538 B. C. In this inſtance, therefore, the Tyrian records confirm the ſacred chronology.

The captivity and reſtoration of the two tribes were foretold; and moreover the preciſe time of both events was alſo prefixed and determined by the prophet Jeremiah, ch. xxv. 11. xxix. 10. This prophecy was firſt delivered (Jer. xxv. 1.) in the fourth year of Jehoiakim; and this ſame year Nebuchadnezzar began to put it in execution. If the commencement of the 70 years' captivity be fixed at the time when Jeruſalem was burnt and deſtroyed, their concluſion will fall about the time when Darius, the ſon of Hyſtaſpes, iſſued his decree for rebuilding the temple, after the work had been ſuſpended, which was in the fourth year of his reign and B. C. 518. Or again if we fix their commencement at the time when Nabuzeradan carried away the laſt remnant of the people, and completed the deſolation of the land, their concluſion will fall about the time when the temple was finiſhed and dedicated, and the firſt paſſover ſolemniſed in it, which was the ſeventh year of Darius and the 515th B. C. Hence Dr. Prideaux obſerves (Conn. part 1. book 3.), "that taking it which way you will, and at what ſtage you pleaſe, the prophecy of Jeremiah will be fully and exactly accompliſhed concerning this matter." Or, it may be ſaid to have been accompliſhed, as biſhop Newton obſerves (vol. vii. p. 187.), at three different times, and in three different manners, and therefore poſſibly all might have been intended, though the firſt was without doubt the principal object of the prophecy. The prophets Iſaiah (xliv. 28.) and Ezekiel (xxxvi. 10, &c.) have previouſly drawn lively pictures of the happy days that ſhould ſucceed the captivity, which were actually realized; for the people returning to their own country, enjoyed the bleſſings of liberty and affluence. The people were multiplied, their cities were inhabited, and their waſtes were cultivated. Whilſt the 10 tribes were diſperſed and loſt, thoſe of Benjamin and Judah, or the Jews, were reſtored, not ſo much for their own ſakes, as for the ſake of the promiſes made unto the fathers, the promiſe to Judah that the Meſſiah ſhould ſpring from his tribe, and the promiſe made to David that the Meſſiah ſhould be born of his family. It was therefore neceſſary for the tribe of Judah, and the families of that tribe, to be kept diſtinct until the coming of the Meſſiah. But ſince theſe ends have been fully anſwered, the tribes of Judah and Benjamin are as much confounded as any of the reſt; all diſtinction of families and genealogies is loſt among them, and the Jews themſelves acknowledge as much, when they ſay, that when the Meſſiah ſhall come, it will be part of his office "to ſort their families, reſtore their genealogies, and ſet aſide ſtrangers."

The captivity, conſidered as a diſpenſation of providence, will appear to have been highly neceſſary and proper, if we reflect, that the lenity of God was manifeſt in bringing this terrible overthrow on the Jews ſo gradually, after a ſucceſſion of judgments from leſs to greater for the ſpace of 22 years, which ſhould have been a warning to them, and by experience have convinced them, that the threatenings denounced by the prophets would certainly be executed:—that it was a juſt puniſhment of their ſins, particularly of their idolatry:—that it was the moſt effectual means to produce their reformation, the great end propoſed by divine wiſdom; and indeed it had this effect, in a very conſiderable degree, for they never more fell into idolatry, but retain the greateſt abhorrence of it even to this day:—that they had ſo far neglected the law of God, written by Moſes, as the rule of their conduct in all affairs civil and religious, and the ground of their happineſs, that at one time it was almoſt unknown and loſt among them (2 Kings, xxii. 8, 12.):—and that this diſpenſation was alſo calculated to produce beneficial effects among the nations, whither they were carried into captivity. The Jews, notwithſtanding their depravity in their own country, during the captivity of 70 years, muſt have been a burning and ſhining light, all over the countries of the eaſt.

Beſides the captivities already enumerated, there happened another conſiderable captivity and diſperſion of the Jews in the time of Ptolemy, the ſon of Lagus, uſually called Soter, about the year B. C. 319; who invaded Judæa, beſieged and took Jeruſalem, and carried above 100,000 of the inhabitants captives into Egypt, planting them in Alexandria and adjacent places. Ptolemy, though at firſt he treated Jeruſalem and Judæa with great ſeverity, conſidering afterwards the ſteadineſs with which they had perſiſted in the fidelity they had ſworn to their governors, on this and a variety of other occaſions, and convinced that this quality rendered them worthy of his confidence, choſe 30,000 of the moſt diſtinguiſhed among them and of ſuch as were moſt capable of ſerving him, and appointed them to guard the moſt important places in his dominions. Many of the Jews followed their captive brethren of their own accord, partly allured by the favour of the king, who gave them equal privileges with thoſe of Alexandria, and partly by the fertility of the country, ſo that this colony, from which ſprung the HELLENISTS, became very conſiderable. The laſt captivity of the Jews was that which happened in conſequence of the deſtruction of their city and temple under Titus about 40 years after our Saviour's aſcenſion. See JERUSALEM.

**CAPTIVITY**, *princes of the*, are heads or chiefs of the Jewiſh nation, appointed for the adminiſtration of juſtice among them, during their captivity both in the eaſt and weſt, ſince the deſtruction of their temple by the Romans. The prince of the captivity in the eaſt, is ſaid to have had the government of the Jews who dwelt in Babylon, Chaldæa, Aſſyria, and Perſia. The prince of the captivity in the weſt, had the direction of thoſe who lived in Judæa, Egypt, Italy, and other parts of the Roman empire. The Jews make a great difference between the patriarchs of Judæa, and the princes of the captivity at Babylon. The latter were called "rabbans," and were ſuppoſed to have deſcended from David, in a direct line by the males; the former or patriarchs, called "rabban," only deſcended from David by the females. The patriarch, who reſided in Judæa, made Tiberias the place of his cuſtomary abode, and aſſumed the title of "Roſchabboth," i. e. the head of the fathers or patriarchs. He preſided in aſſemblies, decided in caſes of conſcience, levied taxes for defraying the charges of his viſits, and diſpatched ſubordinate officers through the provinces to execute his orders. As to the princes of the captivity of Babylon, or the eaſt, their origin and ſucceſſion are unknown; but it does not appear that they ſprung up till about the end of the ſecond century. While the temple ſubſiſted, the eaſtern Jews, as well as weſtern, continued ſubject to the high prieſt. The firſt of theſe princes is ſaid to have been Huna, at the cloſe of the ſecond century; and from Huna to the perfection of the talmud, i. e. 300 years, they ſcarcely produce three. Calmet. See ÆCHMALOTARCHA.

**CAPTURE**, a prize, or prey; particularly that of a ſhip taken at ſea. Captures made at ſea were formerly held to be the property of the captors after a poſſeſſion of twenty-four hours; but the modern authorities require, that before the property can be changed, the goods muſt have been brought into port, and have continued a night *intra præſidia*, in a place of ſafe cuſtody, ſo that all hope of recovering them was loſt. Blackſt. Com. vol. ii. p. 401. See PRIZE and PRIVATEER.

**CAPTURE** alſo denotes an arreſt, or ſeizure of a criminal, debtor, &c. at land.

**CAPTURE**, *de Deſerteurs*. There exiſted under the old government of France an order, by which every intendant of a province or commiſſary of war was authoriſed to pay 100 livres to any perſon or perſons, who ſhould apprehend or ſecure a deſerter, and 300 livres for every man, that could be proved to have enticed a ſoldier away from either the regular army or the militia.

CAPUA, in *Ancient Geography*, a city of Italy, the metropolis of Campania, derives its name, according to Strabo, from *caput*, head. It was ſituated at ſome diſtance to the north of Neapolis, near the mountains; and it was the chief and moſt important city of Magna Græcia. According to Florus, it was one of the three moſt celebrated cities known to the ancients, who placed it next to Rome and Carthage.

"Altera dicta olim Carthago, atque altera Roma,
Nunc proſtrata jacet, proprioque ſepulta ſepulchro."

It is ſaid to have been founded by the Tyrrhenians, who had extended their power into Magna Græcia, about 48 years before the foundation of Rome, or 800 years before the Chriſtian æra. When the Samnites made themſelves maſters of the country, Capua fell into their hands, and Livy ſeeks the etymology of its name in that of their chief, called "Capys." The aſtoniſhing fertility of the adjacent country, and a lucrative commerce, poured, at an early period, immenſe wealth upon its inhabitants, ſo that it became one of the moſt extenſive and magnificent cities in the world. Riches produced exceſſive luxury and inſolence, in both which reſpects, Capua is particularly noticed by ancient writers. The luxury of Capua is ſaid even to have ſurpaſſed that of Sybaris itſelf. See Athenæus Deipnoſophiſt. l. xii. p. 528. ed. Caſaubon. By its inſolence it exaſperated neighbouring nations, which, on account of its effeminacy, it was not able to repel; and therefore it was reduced to the neceſſity of endangering its own ſafety by engaging the ſuccour of needy auxiliaries. The Roman ſoldiers who were ſent to the defence of Capua, were on the point of making it their prey; and the voice of the Roman people often loudly expreſſed their wiſh for a removal from the barren unwholeſome banks of the Tiber, to the garden of Italy, near thoſe of the Volturno. Jealous, and not without reaſon, of the ambition of Rome, or naturally inconſtant, as Livy and ſome other writers ſuggeſt, the Capuans warmly eſpouſed the quarrel of Carthage: and Hannibal, after the battle of Cannæ, made Capua his winter-quarters. In this ſcene of luxury and diſſipation, if we may credit Livy and ſome other hiſtorians, the rough and invincible ſoldiers of the Carthaginian general were metamorphoſed by pleaſure and indolence into ſoft minions, never afterwards fit to cope with the Romans in the field. Hence, it became a proverb, "Capuam Hannibali Cannas fuiſſe;" i. e. Capua was to Hannibal what Cannæ had been to the Romans. The judicious Monteſquieu obſerves, that the Carthaginian army, enriched by ſo many victories, would have found a Capua wherever they had gone. The pernicious effects of idleneſs and luxury are unqueſtionable; but the frequent defeats which Hannibal afterwards gave to the Romans, the ſeveral towns which he reduced in the ſight of the Roman armies, and the bravery with which he maintained himſelf in Italy for 13 years, after the winter ſpent at Capua, conſtrain us to aſcribe ſome degree of rhetorical exaggeration to the accounts of the Roman hiſtorians. Indeed, Livy himſelf points out a cauſe of the declenſion of the Carthaginian power in Italy, which is very different from the delights and debaucheries of Capua. Hannibal, diſappointed of promiſed ſuccour by a domeſtic faction, and deſerted by the Gauls and Italians, who were not natural allies of the Carthaginians, was under the neceſſity of withdrawing from the ſcene of conteſt, and of yielding to a ſuperior force, which drove him from Italy. Liv. l. xxiii. c. 13 and 32. l. xxvi. Whether Capua brought on the ruin of Hannibal or not, Hannibal, without doubt, occaſioned the ruin of Capua. After the departure of the Carthaginians, Capua, which had been long inveſted, ſurrendered at diſcretion to the conſuls Appius Claudius, and Q. Fulvius Flaccus, in the year of Rome 542. On this occaſion, 80 ſenators were ſcourged and put to death; the nobles impriſoned for life, and the citizens ſold and diſperſed. Vibius, Hannibal's principal friend, eſcaped this ignominious fate by a voluntary death; for whilſt the mob inſiſted upon throwing open the gates to the enemy, he aſſembled his ſteady aſſociates, and ſat down with them to a ſuperb banquet; after which, each of the gueſts ſwallowed a poiſonous draught, and expired in full poſſeſſion of their freedom. Although the buildings were left undemoliſhed, Capua was conſigned to be the lodging place for the huſbandmen of the adjoining plain, a warehouſe for goods, and a granary for corn. However, in proceſs of time, about 152 years after this event, Cæſar ſent thither colonies, and reſtored it to its ancient privileges. Cicero appears to have been the patron of this new city, and to have had in charge the inſpection of the ſea-coaſt from Formiæ, A. U. C. 704, B. C. 50. In this command of Capua he calls himſelf the "epiſcopus" of the Campanian coaſt, and he alſo mentions when proconſul of Cilicia, the "dioceſes" that were annexed to his government; and hence it is inferred, that theſe names, which were afterwards appropriated in the Chriſtian church to characters and powers eccleſiaſtical, carried with them in their original uſe, the notion of a real authority and juriſdiction. See DIOCESE. As Capua had been always the common ſeminary, or place of educating gladiators for the great men of Rome, Cæſar had a famous ſchool of them, at the time when Cicero had the command of it. This ſchool he had maintained under the beſt maſters for the occaſions of his public ſhews in the city; and as they were very numerous, and well furniſhed with arms, there was reaſon to apprehend they would break out, and make ſome attempt in favour of their maſter, which might have been of dangerous conſequence in the then exiſting circumſtances of the republic; and, therefore, Pompey thought it neceſſary to take them out of their ſchool, and diſtribute them among the principal inhabitants of the place, aſſigning two to each maſter of a family, by which he ſecured them from doing any miſchief. Cic. ad. Attic. 7. 14.

Tiberius, A.D. 26, dedicated in this place a temple to Jupiter; and in the reign of Nero, A.D. 57, the colonies of Capua, and alſo of Nocera, which were almoſt extinct, were revived and ſtrengthened by a number of old ſoldiers, ſent thither with the ſame prerogatives as the ancient inhabitants. When the cities of Campania were divided between Vitellius and Veſpaſian, Capua maintained its attachment to the former, and in conſequence of this preference, the third legion was quartered there for the winter, and the moſt illuſtrious families were treated with ignominy. At length, Genſeric the Vandal, in the times of the Lombards, was more cruel than the Roman conquerors had been; for he maſſacred the inhabitants, and burnt the town to the ground. Narſes rebuilt it; but in 841 it was totally deſtroyed by an army of Saracens, and the inhabitants were driven into the mountains. Some time after the retreat of theſe ſavage invaders, the Lombards deſcended again into the plain, but apprehending their force not to be ſufficient for the defence of a circuit ſo extended as the old city, they built a ſmaller one on the river Volturno, chuſing for its ſcite that of Caſilinum, which had diſtinguiſhed itſelf in the ſecond Punic war by the reſiſtance of its garriſon againſt Hannibal, and calling it by the old name of Capua. Since the foundation of the new city, old Capua, diſtant from it about two miles, has remained in ruins, occupying a conſiderable extent of ground. Of theſe, the moſt worthy of notice is the amphitheatre, which, though in a degraded and deſolate ſtate, indicates its former grandeur. Two ſmall villages now occupy part of the ſpacious incloſure of this city, which was the centre from whence the via Appia, via Latina, via Domitia, and others, branched off towards different provinces of Italy. Along the edges of theſe roads the ancients buried their dead in magnificent mauſolea, ſome few of which are yet ſtanding, and point out the direction of the highways. The "conocchia," a vulgar name given to one of theſe monuments, from a ſuppoſed reſemblance to a diſtaff, is the handſomeſt, and conſiſts of a cupola, ſurrounded with columns placed upon a ſquare tower.

In 856, Landulph formed at Capua an independent earldom, diſmembered from the duchy of Benevento; and in the courſe of a few generations, it acquired the title of a principality. In the 11th century, the Normans of Averſa expelled the Lombard race of princes, and Richard their chief became prince of Capua. The grandſon of Tancred of Hauteville drove out the deſcendants of Richard, and united this ſtate to the reſt of his poſſeſſions

Capua is at preſent a neat little city of Naples, in the country of Lavora, ſeated at the foot of a mountain, the ſee of an archbiſhop, founded in 968. It contains, beſide the cathedral, one collegiate, 16 pariſh churches, and 12 convents. It may be conſidered as the key of the kingdom; for though far removed from the frontier, it is the only fortification that really covers the approach to Naples, from which it is diſtant about 15 miles. The ſtreets are more open and airy than thoſe of other towns in this kingdom, and the buildings better. Many of them are conſtructed with materials brought from the ancient city. N. lat. 41° 7′. E. long. 15° 5′.

CAPUCHE. See Cowl, and next article.

CAPUCHINS, religious of the order of St. Francis, in its ſtricteſt obſervance. The capuchins are thus called, from *capuce*, or *capuchon*, a *ſtuff cap*, or *cowl*, wherewith they cover their heads; and which they added to the ordinary Franciſcan habit. They are cloathed with brown or grey; are always bare-footed; and never go in a coach, nor ever ſhave the head.

The Capuchins are a reform made from the order of Minors, commonly called *Cordeliers*, ſet on foot in the ſixteenth century by Matthew de Baſſi, a religious obſervant of the monaſtery of Monteſiaſcone, who, being at Rome, ſaid he was advertiſed ſeveral times from heaven, to practiſe the rule of St. Francis to the letter. Upon this he made application to pope Clement in 1525, who gave him permiſſion to retire into a ſolitude; together with as many others as would embrace the ſtrict obſervance; which ſome did accordingly. In 1528, they obtained the pope's bull. In 1529, the order was brought into complete form; Matthew was elected general, and the chapter made conſtitutions. In 1543, the right of preaching was taken from the Capuchins by the pope; but in 1545, it was reſtored to them again with honour. In 1578, there were ſeventeen general chapters in the order of Capuchins.

The Capuchins were at firſt reſtrained from ſpreading out of Italy; but Charles IX. of France, writing to pope Gregory XIII. to demand ſome Capuchins, that pope, by a bull, dated in 1575, took off the prohibition, and granted them leave to ſettle any where. The cardinal of Lorraine built them a convent at Meudon, and Henry III. another at Paris, in the rue St. Honoré. F. Zach. de Boverio has written the annals of the Capuchins in Latin, in three volumes folio, from the year 1524 to 1634.

Capuchin, in *Ornithology*, the name of a particular ſpecies of pigeon, in ſhape and make much like the jacobine, or jack, but ſomething larger than that; its beak alſo is longer; and it has a tolerable hood of feathers on the back part of its head, but has no cravat or chain down the ſhoulders as that ſpecies has. Its marks are the ſame with the jacobine, and it ſeems to be no other than a baſtard breed between that and a common pigeon.

Capuchin *Monkey*, in *Zoology*. See Capucina Simia.

Capuchin *Powder*, in the *Materia Medica*. See Cevilla, Sabadilla, and Veratrum.

CAPUCIATI, in *Eccleſiaſtical Hiſtory*. an appellation given to the followers of Wickliff in the fourteenth century, by reaſon they did not uncover themſelves before the hoſt, but kept on their *capuce*, or cap uſed in thoſe times. Spondanus ſpeaks of the capuciati, under the year 1387.

Capuciati. See Caputiati.

CAPUCINA, in *Entomology*, a ſpecies of Phalæna, (Bombyx) that inhabits Europe. The wings are dentated and ferruginous, with a dorſal reflected tuft.

Capucina, in *Zoology*, a ſpecies of Simia, of the long-tailed, or ſapajou tribe, called by Pennant the *Capucin monkey*. This kind is diſtinguiſhed by having no beard, the tail hirſute, (and prehenſile): hair and limbs black; haunches covered, or without calloſities. Simia imberbis nigra, cauda longa hirſuta, facie flaveſcente. Linn.

There are three kinds of monkey, ſimia trepida, appella, and capucina, that are nearly allied to each other: ſome conſider the two laſt as varieties of the ſame ſpecies; Schreber makes them diſtinct.

Gmelin deſcribes this animal as being about the ſize of the domeſtic cat: the general colour brown, with the head, legs, and tail black; face ſometimes black, ſometimes fleſh-coloured; tuſks approximate; noſe carinated near the eyes; a black retractile wrinkle juſt under the hair of the forehead; tail long, curved, and ſhaggy, with hair, which it carries ſpirally rolled up, and often coiled round the neck. In the Leverian Muſeum is a ſpecimen of this animal agreeing with the deſcription given of the ſpecies by Mr. Pennant and Dr. Shaw. The face is round, flat, and fleſh-coloured; encircled with upright whitiſh hairs; the breaſt covered with long ſhaggy yellowiſh white hairs; top of the head blackiſh; hair on the ſhoulders and upper part of the back lighter than on the lower part; tail as in the former ſpecies; toes with crooked claws inſtead of flat nails.

Simia capucina is ſaid to be a native of South America. The animal ſmells muſky, has a wailing voice, ſometimes ſhrieks like the cicada, or when irritated yelps like a whelp, and terrifies or repels its enemies by hideous howlings.

CAPUCINUS, in *Conchology*, the name by which Rumpfius diſtinguiſhes *conus monachus* of Linnæus.

Capucinus, in *Entomology*, a ſpecies of Bostrichus in the Fabrician ſyſtem, (*Dermeſtes*, Linn. and *Boſtrichus*, Geoffr.) The colour of this inſect is black, with red abdomen and wing-caſes; and retuſe thorax. Inhabits Europe.

Obſ. Lepechin deſcribes a variety of this inſect with a black abdomen. This is found in Siberia.

Capucinus, the name given by Walch to the Linnæan butterfly, Papilio Iphicla, which ſee.

CAPUL, in *Geography*. See Capoul.

CAPURA, in *Botany*, Linn. Mant. 225. Schreb. 599. Willd. 683. Juſſ. 437. Claſs and order, *hexandria monogynia*.

Gen. Ch. *Cal.* none. *Cor.* monopetalous, tubular; tube cylindrical; border with ſix roundiſh diviſions, the outer alternate ones narrower. *Stam.* Filaments ſcarcely any; anthers ſix, oblong, within the tube; the alternate ones higher. *Piſt.* Germ ſuperior, triangularly roundiſh, truncate; ſtyle cylindrical, very ſhort; ſtigma nearly globular. *Peric.* Berry?

La Marck thinks it has ſome affinity to the genus *Dais.*

Eſſ. Ch. *Calyx* none. *Corolla* ſix-cleft. *Stamens* within the tube. *Stigma* nearly globular.

Sp. C. *purpurata.* A tree. *Branches* alternately in pairs at right angles with each other, purpliſh. *Leaves* deciduous, oppoſite, egg-ſhaped, reſembling thoſe of lonicera xyloſteum, entire, rather acute, on very ſhort petioles. *Flowers* in axillary cluſters, purple, ſhorter than the leaves. A native of the Eaſt Indies.

CAPURSO, in *Geography*, a town of Naples, in the country of Bari; 3½ miles S.E. of Bari.

CAPUT. See HEAD.

CAPUT, in the *Univerſity of Cambridge.* See CAMBRIDGE.

CAPUT *Baroniæ*, the head of the barony, in *Ancient Cuſtoms*, denotes the ancient or chief ſeat or caſtle of a nobleman, where he made his uſual reſidence, and held his court: ſometimes alſo called *caput honoris*, or the head of the honour.

The *caput baroniæ* could not be ſettled in dowry; nor could it be divided among the daughters in caſe there were no ſon to inherit; but was to deſcend entire to the eldeſt daughter, *cæteris filiabus aliunde ſatisfactis.*

CAPUT *Coli*, in *Anatomy*, the commencement of the large inteſtine, which is alſo called the cœcum. See INTESTINE.

CAPUT *Draconis*, a denomination given by ſome to a fixed ſtar of the firſt magnitude, in the head of the conſtellation draco, called alſo by the Arabs *raſaben* and *eltanin.* See NODE.

CAPUT *Gallinaceum*, in *Botany*, Lob. Ic. ii. p. 81. See HEDYSARUM *onobrychis.*

CAPUT *Gallinaginis*, or *Verumontanum*, in *Anatomy*, a ſmall production of the proſtate gland, projecting into the lower part of the urethra, where that canal penetrates the proſtate, and having on its ſurface the openings of the ducts, formed by the union of the vaſa deferentia, and veſiculæ ſeminales. See GENERATION, *Organs of.*

CAPUT *Jejunii*, a name given to Aſh-Wedneſday, as being the firſt day of the Lent-faſt.

CAPUT *Lupinum.* An outlawed felon was anciently ſaid to have *caput lupinum*, and might be knocked on the head like a wolf, becauſe, having renounced all law, he was to be dealt with as in a ſtate of nature, when every one that ſhould find him might ſlay him: but now the wilful killing of ſuch a one is murder, unleſs in the endeavour to apprehend him.

CAPUT *Meduſæ*, in *Aſtronomy*, a northern conſtellation included in that of PERSEUS.

CAPUT *Meduſæ*, in *Botany*, Moriſ. Hiſt. iii. p. 210. See ELYMUS *Caput meduſæ.* See alſo EUPHORBIA *Caput meduſæ.*

CAPUT *Mortuum.*—*Tête morte*, Fr. *Todtenkopfe*, Germ. This term is at preſent obſolete. It was uſed by the old chemiſts to expreſs the reſidues of diſtillations after all the volatile parts had been driven off by the action of heat. Theſe reſidues were at firſt thrown away as of no value. Glauber was the firſt who particularly employed himſelf in their examination, and was rewarded for his pains by the diſcovery of the ſalt that bears his name, (ſulphat of ſoda), in the caput mortuum remaining after the diſtillation of muriatic acid from common ſalt and green vitriol; and of ſulphat of potaſh in the reſidue after the diſtillation of nitric acid from nitre and ſulphat of iron.

CAPUT *Pancreatis*, in *Anatomy*, that portion of the pancreas, which is attached to the duodenum. See PANCREAS.

CAPUT *Porcinum*, *ſwine's head*, a denomination given by the Romans to an order of battle more frequently called *cuneus.*

CAPUT *Purgia*, a barbarous term uſed by ſome phyſicians to denote medicines which cleanſe the head, either in the way of ſneezing, more frequently called *errhines*; or by chewing in the way of ſalivation, called *apophlegmatizants.* See ERRHINA and STERNUTATIVE.

CAPUT-*ſerpentis*, in *Conchology*, a ſpecies of ANOMIA, the ſhell of which is obovate, ſtriated, and downy; one valve with a long perforated beak. Linn. Fn. Suec.

Inhabits the deeps of the Norway ſeas, and is generally found adhering to the *madrepora prolifera.* Shell white, longitudinally ſtriated. Upper valve prominent behind, declining at the anterior part, and marked with a groove in the middle; lower valve rounded, and retuſe before.

CAPUTA, in *Ancient Geography*, a town of Armenia Minor. Ptolemy.

CAPUTIATI, or CAPUCIATI, in *Eccleſiaſtical Hiſtory*, a ſect of fanatics, ſo called from a ſingular kind of cap that was the badge of their faction, which infeſted the province of Burgundy, the dioceſe of Auxerre, and ſeveral other parts of France, towards the cloſe of the 12th century, and excited much diſturbance among the people. They wore upon their caps a leaden image of the Virgin Mary, and they publicly declared that it was their purpoſe to level all diſtinctions, to abrogate magiſtracy, to remove all ſubordination among mankind, and to reſtore that primitive liberty and natural equality that were the ineſtimable privileges of the firſt mortals. They were attacked with the force of arms by Hugo, biſhop of Auxerre. Moſh. Eccl. Hiſt. vol. iii. p. 128.

CAPUTUADE, in *Geography*, a port of Africa, in Byzacium, where the Roman fleet landed the troops that made war againſt Gelimer; diſtant, according to Procopius, five days' journey from Carthage. Juſtinian, he adds, built a town in this place incloſed by ſtrong walls.

CAPYÆ, in *Ancient Geography*, a town of the Peloponneſus, in Arcadia, near Mantinæa, according to Dion. Hal. and Strabo, who ſuppoſed it to have been built by Æneas.

CAPYBARA, or CAEYBARA, in *Zoology*, the American name of a ſpecies of CAVIA, found in that part of the world, and called by Engliſh writers the *water cavy*, or *river cavy.* It is diſtinguiſhed by having no tail, and the fore-feet three-toed, and palmated. See CAVIA.

CAPYS, in *Entomology*, a ſpecies of SPHINX, (Zygæna) of a black colour, with the tip of the anterior pair white. Fabr.—Inhabits Surinam.

CAPYTIUM, in *Ancient Geography*, a town of Sicily. Ptolemy.

CAR. See CARR.

CAR, or KAR, ſignifies in the oriental languages a *town*; and of courſe enters into the compoſition of the names of ſeveral places.

CAR, or CAM LOUGH, in *Geography*, a ſmall lake in the county of Armagh, Ireland, at the foot of Slieve Gullien mountain, from which a narrow and rapid ſtream flows for a courſe of about four miles, when its waters contribute to the ſupply of Newry canal. This lake, river, and a ſmall village, all of the ſame name, are mentioned on account of the great buſineſs done on the banks of the ſtream. So elevated is the ſource of it, that there are a great number of ſcites of mills, all of which are overſhot. So ſudden, indeed, are the falls, that no head of water is required as a mill-pond for any of the works, the tail-race of the higher mill being the head of the next below, and ſo in ſucceſſion until it reaches the valley. In the ſpace of within two miles, there are four extenſive bleach-greens, three of which can finiſh 50,000 webs in a year; a very large boulting-mill, beſide two other flour-mills; a flax-mill, and ſome other manufactories about to be eſtabliſhed. Theſe numerous works furniſh an eminent inſtance of the ſuperior ſpirit and induſtry of the people in this part of Ireland, who ſo eagerly ſeize every natural advantage for furthering and increaſing their trade. Coote's Armagh.

CARA, in *Botany*, Franciſc. Gært. tab. 25. *fig*. 8. See DIOSCOREA *aculeata*.

CARA, in *Geography*, a river of European Ruſſia, which directs its courſe towards the Arctic Ocean, and forms the boundary between Aſia and Europe, for the ſpace of about 140 miles; the Arabian chain terminating ſo far from the ſea of Cara-ſkoi, or Karſkoi.

CARABA, or CRAB-*tree*, in *Botany*, attains in Guiana the height of 40 feet, and conſiſts of numerous branches, covered with long, narrow leaves of a green colour. Its numerous white bloſſoms are ſucceeded by nuts about the ſize of a large cheſnut, the form of which is angular and flattiſh; within the thin, brown, huſky ſhell is contained a white oleaginous kernel. From theſe kernels the Indians extract, by bruiſing, macerating, and boiling, a yellowiſh, bitter, butyraceous oil, with which they conſtantly greaſe and rub their naked ſkins: thus defending themſelves from muſquetoes, ſoftening their ſkins, and preſerving them from taking cold by dews, rain, &c. Bancroft's Guiana, p. 81.

CARABAYA, or CARAVAYA, in *Geography*, a diſtrict or juriſdiction of South America, in the dioceſe of Cuzco, and vice-royalty of Buenos Ayres, commencing 60 leagues S.E. of Cuzco, and extending above 50 leagues. The greater part of it is cold; but the vallies are fertile, producing various ſorts of fruits, grain, and pulſe, and affording ſufficient paſture for cattle of all kinds. This province has ſeveral gold mines, particularly that called "Aporama," which is very rich and the metal 23 carats fine, and alſo ſilver mines, which produce vaſt quantities of that metal. The river which ſeparates this province from the mountains of the wild Indians abounds ſo much in gold, that at certain times the Caziques ſend out a certain number of Indians in companies from the towns in their reſpective diſtricts, to the banks of the river, where, by waſhing the ſands in ſmall wells dug for that purpoſe, they ſoon find ſufficient quantity of gold to pay the royal tribute. This kind of ſervice they call "Chichina."

CARABE, or KARABE, denotes yellow AMBER.

CARABIA, in *Ancient Geography*, a town of Macedonia, placed by Ptolemy in Mygdonia.

CARABIN, or CARBINE, in French *Canon carabiné*, is a fire-arm about a tenth of an inch ſmaller in the bore than a muſket, and about five inches ſhorter, having its barrel about three feet one inch long, and its whole length, including the ſtock, about four feet one inch. Carabines, or canons carabiné, have the outſide of their canons or barrels of the ſame figure and form with thoſe of common muſkets. But they are generally, or at leaſt often rifled on the inſide, having longitudinal grooves ſometimes ſtraight, but much oftener circular or ſpiral, running the whole length of the bore. When grooved, they are generally fired with leaden bullets, that are rammed down along the grooves with iron rammers or ram-rods, which ramming, together with the force and velocity with which they are driven back along the ſame grooves by the inflamed powder, conſiderably alters their ſhape and figure. The common obſervation, however, that a ball ſo rammed down and fired from ſuch a piece goes farther than one of the metal that has windage, in conſequence of its being long enough in the barrel for the complete inflammation of the charge of powder, is founded in miſtake. The grooves, when they are made winding, give the ball a ſort of rotatory motion round its axis in the direction of its flight, that prevents its deflection from the path of its projection.

CARABINEER, or CARBINEER, in French *Carabinier*, was a ſoldier choſen from among the beſt and moſt expert ſhooters, who ſerved ſometimes on foot, but generally on horſeback, and carried a carabine longer than the ordinary fuſee, and commonly rifled. No corps in the French ſervice has diſtinguiſhed itſelf more than the carabineers. They immortalized themſelves at the battle of Fontenoy. Any deficiencies in it, either in men or officers, were filled up from the regiments of French cavalry, according to their ſeniority. As to the time of raiſing it, or its ſeniority of creation, it would have been the twelfth regiment in that ſervice; but in conſequence of ſome other regiments having the name of Royal, and therefore ſtanding before them, it only occupies the twenty-ſecond rank or place.

Formerly, all regiments of light armed horſe were called carabineers. But, ſince the eſtabliſhment of huſſars and chaſſeurs, they have loſt that appellation. And now all the heavy foreign cavalry are denominated carabineers.

CARABINS, otherwiſe called *Argoulets*, were a ſpecies of huſſars in the ancient French militia, and ſometimes acted on foot. There were choſen and reſolute men. All the principal officers of the army uſed to have them as their guards. And they were often ſtationed at the outpoſts for the purpoſe of haraſſing the enemy, guarding narrow paſſes, &c. In action they generally engaged in front of the dragoons, or on the wings of the firſt line. The term comes from the Arabian word *Karab*, which ſignifies generally a warlike inſtrument of any kind.

CARABON, in *Botany*. Lam. Encyc. (Kari-bepou: Rheed. Mal. 4. p. 109. tab. 53. Olea malabarica Nimbo dicta, fructu racemoſo rotundo: Rai. hiſt. 1545.) *Cal.* ſmall, with five acute diviſions. *Cor.* Petals five, lanceolate. *Stam.* Filaments ten, the length of the petals. *Piſt.* germ ſuperior: ſtyle ſmall, whitiſh: ſtigma headed, greeniſh. *Peric.* Berry round, with one ſeed. A large ever-green tree. *Branches* reddiſh, woolly. *Leaves* winged, with a diſagreeable ſmell and a ſouriſh bitter taſte. *Flowers* in terminal panicles, ſmall, whitiſh, with a ſtrong ſmell. An oil is expreſſed from the fruit. A native of Malabar, where it bears flowers and fruit twice in the year. Allied to Melia and Murraya.

CARABUS, in *Entomology*, a genus of Coleopterous inſects that have the antennæ filiform: thorax ſomewhat heart-ſhaped, truncated behind, and with the wing-caſes margined.—This is the eſſential character of the genus carabus, but which is diſtinguiſhed further by having ſix feelers, each of which has the laſt joint obtuſe, and truncated: the abdomen ovate; and the poſterior thighs furniſhed with an appendage at the baſe. The mouth is alſo ſmall, the lip, in ſome entire and truncated as in the true Fabrician carabi: dentated as in his *ſcarites*, or trifid, as in his *manticora*, all which belong to the Linnæan carabi, except a few of the Scarites that are Tenebriones of that author. The legs of the carabi are alſo long, the thighs compreſſed, ſhanks round and ciliated within, the anterior part ſpinous before the tips, and the tarſi of all the legs compoſed of five joints

Olivier divides the Linnæan Carabi into a variety of new genera, as cychrus, caloſome, galerite, brachinus, anthie, manticore, ſcarite, leſteve, and odacanthe. An arrangement ſomewhat ſimilar to this appears in the different ſyſtems propoſed by Fabricius, but not the ſame, and further alterations ſtill have been adopted by other French authors beſides Olivier. We think the carabi may, notwithſtanding, be extremely well diſtinguiſhed by adhering much nearer to the example of Linnæus; the manticora and ſcarites we ſhould ourſelves ſeparate as diſtinct genera from the carabus, but it is impoſſible to conceive the neceſſity of rending the Linnæan genus into ſo many parts as Olivier has to form ſo many new genera:—improvement, and not innovation, ſhould be the leading object of naturaliſts when they preſume to deviate from the authority of their predeceſſors. That the Linnæan carabi, even if we abide by the Linnæan method, ſhould be ſeparated into diſtinct tribes, is ſufficiently apparent to every entomologiſt; we only mean to maintain that by thus dividing them into tribes, they may with few exceptions be retained under one generical title with more convenience, and more propriety, than under ſuch a number of different genera as the French writers are inclined to make of them. Fabricius even ſeems aware of this, for although he forms new genera of part of the Linnæan carabi, his own genus carabus is divided into four diſtinct ſections: * *Thorace cordato.*—** *Thorace poſtice anguſtato.*—*** *Thorace quadrato.*—**** *Thorace rotundato margine prominulo obtuſo.* Mr. Marſham, in his recently publiſhed work, Entomologia Britannica, has alſo ſhewn that it is far better to ſubdivide the Linnæan carabi into ſections than to conſtitute new genera; the ſpecies of carabus found in England, which are thoſe that chiefly demanded his attention, he divides into ſix ſections, in the following manner. 1. Thorace poſticè angulato.—2. Thorace poſtice truncato integro, elytris æquali.—3. Thorace poſticè truncato integro, elytris anguſtiori.—4. Thorace poſticè truncato integro elytris anguſtiori, ſub-elongato, attenuato.—5. Thorace poſticè rotundato.—6. Thorace remoto. Gmelin divides the carabus genus into only two parts, diſtinguiſhing the inſects according to their ſize, *majores* and *minores*, in the laſt edition of the Linnæan Syſtema Naturæ. Turton, in his tranſlation of that work, entirely deviates from his author; he adopts the Fabrician ſubdiviſions, and this is certainly an improvement, but it ſhould have been mentioned as ſuch. The following arrangement of the numerous ſpecies of this genus will be found to correſpond as nearly with the Linnæan and Fabrician authorities as the lateſt obſervations and diſcoveries of authors will conveniently admit.

Many of the inſects of this genus poſſeſs the ſame habits of life. Their larvæ live in the earth, under ſtones, or in decayed wood, and are for the moſt part unknown. In the laſt or perfect ſtate a number of the ſpecies are deſtitute of wings, but they are remarkably active, and run ſwiftly. Some kinds avoiding the light appear only in the night time, while others ramble about in the middle of the day, and ſeem to be moſt vigorous when the ſun ſhines intenſely hot, at which time numbers of them may be ſeen running in pathways, and ſandy places. If theſe inſects are cloſely purſued, they emit a ſtrong, and highly fetid odour, and when caught immediately eject both from the mouth and vent, a duſky greeniſh, or in ſome ſpecies, a reddiſh liquor of an extremely acrid and cauſtic nature, the ſmell of which is ſimilar, but rather more powerful than the odour it ſends forth when purſued. This offenſive humour ſeems to be a proviſion of nature deſigned to compenſate for having denied thoſe creatures wings to facilitate their retreat from other voracious inſects that are furniſhed with wings, the ſmell being alone ſufficiently repulſive, it is reported, in many ſpecies, to check their ferocious purſuers till they can retire to ſome place of ſafety. They can alſo, as we may know by experience when handling them, defend themſelves extremely well by means of their jaws with which they can pinch ſmartly, and no doubt inflict a ſevere wound on the generality of inſects; one or two ſpecies of the winged kind of carabi, if not more, are able alſo to terrify their antagoniſts by making a loud, and frequently repeated ſnapping noiſe, which by ſome has been compared to the exploſion of a muſquet in miniature. This faculty is more completely exemplified in the little ſpecies which the French call *Bombardier*, *Carabus crepitans* of Linn. Faun. Suec. and of later entomologiſts. It has been affirmed by ſome lively writers, that "this inſect poſſeſſes the extraordinary faculty of diſcharging from behind, on being purſued or irritated, a bluiſh, fetid, and penetrating vapour, accompanied by a very ſmart exploſion." "And this operation (it is added) the inſect has the power of repeating ten, twelve, or even twenty times in ſucceſſion with equal violence, thus frequently eſcaping by terrifying its purſuers." (Shaw, Zool.) Another hiſtorian of this pigmy muſqueteer inſiſts that "the ſmoke emitted at the time of each exploſion is ſo denſe as to completely conceal the inſect for the ſpace of a few moments from its purſuers, during which interval the wary creature, like an able warrior, may, and does frequently effect its retreat in good order under cover of the ſmoke occaſioned by its own fire." The recital of this laſt account excites a ſmile; we wiſh that much of the firſt mentioned circumſtances may not prove a goſſip's tale for the credit of thoſe who have aſſented to it. This inſect, it really appears on credible authority, is able to make a loud noiſe, either by means of the vent, or by rubbing its wing-caſes ſmartly together, and to repeat the noiſe at pleaſure, or as its dangers may require; what has been further ſtated muſt be at leaſt received with caution by thoſe diſpoſed even to liſten attentively to reports ſo marvellous.

The ancients conſidered the carabi as poiſonous, and ſuppoſed that if their cattle happened to devour any of them, which muſt often happen when they were grazing, an inflammation of the inteſtines would enſue. The carabi formed alſo an article in their materia medica; both Hippocrates and Pliny ſpeak of them, and attribute to them the ſame properties as the cantharides.

The ſpecies of this genus are as follow.

### Section 1ſt. *Thorax heart-ſhaped.*

Carabus *maxilloſus* of Thunberg, is one of the largeſt ſpecies of this genus. It inhabits the Cape of Good Hope. Olivier deſcribes the ſpecies from a ſpecimen in the Bankſian cabinet. This inſect is apterous; black; mandibles exſerted, and as long as the head; thorax produced behind, and bilobate. Obſ. The antennæ are black with the tips fuſcous; head exſerted, flat in front, with the ſhield rounded and entire; mandibles acute, or pointed at the tips and entire; ſhells glabrous, black, and very ſlightly dotted. Fabr. This muſt not be confounded with manticora maxilloſa of Fabricius, which De Geer calls a carabus (C. tuberculatus.)

Carabus *thoracicus*. Apterous, or without wings, black; thorax lengthened behind into two lobes: ſides and margins of the ſhells villous, white, Fabr. Thunb. Obſ. This is much allied to the preceding inſect, and inhabits the ſame country.

Carabus *coriaceus*, one of the Linnæan ſpecies. This is of the apterous or wingleſs kind; its colour black and opake; ſhells connected, with intricate ſubrugoſe dots. Linn. An inhabitant of Europe, and called by Geoffroy Bupreſtis ater.

Carabus *glabratus*; apterous, entirely black, very ſmooth, and gloſſy. Fabr. Obſ. This is the *Carabus glabratus* of Paykull, and *Carabus convexus* of Herbſt. Inhabits Germany and Sweden.

Carabus *violaceus*, of Linn. and Paykull, is a ſpecies nearly allied to the former. It is apterous, of a black colour, with ſmooth ſhells, the edges of which, and the margin of the thorax are violet.

Carabus *purpuraſcens*, is of the apterous kind, and a black colour, with ſtriated ſhells; margins of the thorax and ſhells violet. Inhabits Germany. Fabr.

Carabus *cyaneus*, *Carabus intricatus* of Linnæus. This is apterous, of a black colour: wing-caſes with rough intricate dots. Paykull, Monog. This is called by Geoffroy *Bupreſtis nigro-violaceus*. Inhabits woods in Europe. Mr. Marſham deſcribes the Linnæan carabus intricatus as an Engliſh ſpecies. Vide Ent. Brit.

Carabus *catenulatus*, of Scopoli. *Carabus prollematicus* of Herbſt. This inſect bears a ſtrong reſemblance to C. purpuraſcens, but has the body ſhorter, and is in other reſpects diſtinct. It is of the apterous kind; colour black; thorax and wing-caſes edged with azure; ſhells ſtriated, and marked with a triple row of impreſſed dots.

Carabus *carolinus*. Apterous, black; thorax and ſhells very ſmooth, and braſſy-green. Inhabits South Carolina.

Deſcribed by Fabricius from the cabinet of Gygot d'Orcy of France. It is of a large ſize with the head black, and braſſy behind; thorax braſſy with an impreſſed dorſal line; ſhells without ſpots; body and legs black. Fabr.

Carabus *hiſpanus*. Apterous, black; thorax azure; wing-caſes rough and golden. Fabr. Found by Prof. Vahl in Spain. Obſ. The body is black; margins of the ſhells azure; legs black.

Carabus *monilis*, a native of Saxony, Hybner. This is black, with the thorax coppery; ſhells ſtriated, coppery-green, with three ſtreaks of oblong elevated dots. Size of the following ſpecies.

Carabus *hortenſis*. Apterous, black, ſhells ſomewhat rough with a triple ſeries of hollow bronzed dots, and azure margin. Linn. A native of Europe, and inhabits England, Donov. Brit. Inſ. This is the *carabus violaceus* of De Geer. Colour variable from black to greeniſh or braſſy-green. Found in gardens chiefly. About an inch in length.

Carabus *gemmatus*. Apterous, black, ſhells ſtriated with a triple ſeries of double, or two-lobed braſſy dots. Fabr. *Carabus ſtriatus* of De Geer. An European ſpecies.

Carabus *concolor*. Apterous, black, wing-caſes ſtriated, with a triple ſeries of excavated dots. Fabr.

This inhabits Germany. Size ſmaller than *carabus hortenſis*. The head is black, gloſſed with copper, and immaculate; thorax black, ſlightly tinged with azure; excavated dots of the ſame colour as the ſhells, not braſſy as in hortenſis, and the body black.

Carabus *tædatus*. A North American ſpecies of the apterous kind, and black colour; ſhells ſomewhat ſmooth, fuſcous, with a triple ſeries of excavated dots. Fabr. Obſ. The ſuture of the ſhells is black.

Carabus *irregularis*. This is apterous; head and thorax coppery: ſhells more duſky, with the margins, and triple ſeries of excavated dots coppery. Found in decayed beech trees in Europe. Helwig.

This reſembles *carabus hortenſis*: the antennæ are black with the firſt joint ferruginous, its head coppery, and mouth black; ſhells irregularly punctured; and body black.

Carabus *arvenſis*. Apterous, black, and coppery; ſhells ſtriated with a triple ſeries of hollow dots. Paykull, Monogr. Inhabits Europe, principally Germany. Probably the ſame as *Carabus catenulatus*, Marſh. Ent. Brit.

Carabus *hungaricus*. Apterous, black; ſhells very ſmooth, and punctured with a triple row of black dots. Inhabits Hungary, Smidt. Obſ. The body is entirely black, and the margins are not bluiſh, as in ſome analogous inſects.

Carabus *retuſus*. An inſect the ſize of C. *hortenſis*, found on the ſhores of Patagonia, and preſerved in the Bankſian cabinet. This is apterous; ſhells ſtriated, greeniſh, with a triple ſeries of braſſy hollow dots, and retuſe at the baſe. Fabr. Obſ. The antennæ of this inſect are brown, but at the baſe black; the head greeniſh, with black mouth; thorax green and impreſſed on each ſide at the baſe; ſhells with crenated ſtriæ; body black.

Carabus *Maderæ*. Apterous, black, with the ſhells retuſe at the baſe.

Deſcribed by Fabricius from a ſpecimen in the Bankſian cabinet found at Madeira. Much allied to the preceding; the antennæ black with fuſcous apex; ſhells ſlightly ſtriated, and marked with a triple ſeries of minute greeniſh impreſſed dots: legs black.

Carabus *convexus*. Apterous, convex, black, ſmooth, with the poſterior part of the thorax emarginate. Paykull. A native of Germany.

Carabus *auratus*. Apterous; ſhells golden and furrowed; antennæ and legs rufous. Linn. Inhabits Europe.

Carabus *ſplendens*. Apterous; above bronzed, and gloſſy, ſuture of the ſhells coppery. Found in Jamaica. Boſe. Obſ. This is a large ſpecies. The head is marked with two furrows, and braſſy, its mouth and antennæ black; ſhells very ſmooth; body black. *Carabus ſplendidus* of Gmelin.

Carabus *ſuturalis*. An inſect reſembling the foregoing that inhabits Terra del Fuego, deſcribed by Fabricius, from a ſpecimen in the Bankſian cabinet. This is of the apterous kind; ſhells ſtriated, and greeniſh with golden ſuture.

The antennæ of this ſpecies are dark brown, ferruginous at the baſe; head green, mouth fuſcous; thorax green with golden margin; ſhells ſlightly ſtriated with a triple ſeries of ferruginous dots; breaſt greeniſh; legs ferruginous.

Carabus *nitens*. Apterous; ſhells rough, greeniſh, with longitudinal raiſed lines, golden margin, and black legs. Linn. *Carabus auræus* of Degeer.

Carabus *auronitens*. Nearly allied to the former; it is of the apterous kind, with rough greeniſh ſhells marked with three longitudinal raiſed lines, and rufous thighs. Inhabits Germany.

Carabus *morbilloſus*. Apterous; thorax coppery; ſhells ſtriated, coppery, with longitudinal elevated dots, and rugged furrows. Fabr.

Carabus *rugoſus*. Apterous, black; ſhells with rugoſe ſtriæ, and three rows of elevated dots between them. Deſcribed by Fabricius from the cabinet of Seheſtedt as a native of Morocco; it is twice the ſize of carabus granulatus.

Carabus *clathatus*. Apterous, blackiſh-braſſy, with rows of coppery excavated dots between the ſtriæ. Linn. Inhabits Europe.

Carabus *granulatus*. Apterous, blackiſh; ſhells braſſy, with rows of oblong raiſed dots between the ſtriæ. Linn, &c. Inhabits Europe.

Carabus *roſtratus*. Apterous; ſhells ſmooth, and black, and wider than the thorax; head very narrow.

This is an European ſpecies, and has been deſcribed by authors under various names; Degeer calls it carabus coadunatus, Linnæus tenebrio roſtratus, and Paykull as well as Fabricius carabus roſtratus, and by Fabricius in his appendix cychrus roſtratus.

Carabus *attenuatus*. Apterous, black, ſhells ſlightly gloſſed with coppery, with a triple ſeries of elevated dots; thorax narrower; head very narrow. Panzer, &c. This inhabits Europe, particularly Germany: in the laſt work of Fabricius it ſtands in the new genus cychrus under the ſpecific name of *attenuatus*.

Carabus *elevatus*. Apterous; thorax with reflected margin; ſhells violaceous; body black. Fabricius.

This and the following ſpecies inhabit South America, and are deſcribed from the Hunterian muſeum.

Carabus *unicolor*. Apterous; thorax with reflected margin; body black, and ſhells ſtriated.

Carabus *attelaboides*. Apterous, black; thorax ſomewhat heart-ſhaped, and narrow; head attenuated behind; ſhells grooved and furrowed. Fabr. An Indian ſpecies, in the Bankſian cabinet.

Carabus *leucophthalmus*. Apterous, black; ſhells ſtriated; thorax with ſhort impreſſed lines at the baſe. Linn. Inhabits Europe, and is found in England.

Carabus *planus*. Winged, depreſſed, black, with ſlightly ſtriated wing-caſes. Fabr. Ent. Syſt. *Carabus ſpiniger* of Paykull, and *carabus obſoletus* of Faun. Etruſc. Obſ. Mr. Marſham in his Ent. Brit. conſiders this inſect the ſame as the foregoing; namely, carabus leucophthalmus of Linn. Fabricius tells us it is rather larger, and has the body entirely black, and without ſpots; thorax heartſhaped, ſmooth, and without the little impreſſed lines at the baſe as in the former inſect.

Carabus *ſtriatulus*. Winged, black; thorax at the baſe with an impreſſed dot; wing-caſes ſtriated, and glabrous in the middle. Deſcribed by Fabricius from the Bankſian cabinet. Inhabits the ſhores of Patagonia.

Carabus *ſabuloſus*. Winged, pale; head, and dorſal ſpot on the body black. Fabr. A native of Saxony.

Carabus *arenarius*. Winged, pale; with two black dorſal ſpots on the wing-caſes. Inhabits ſandy ſhores of Wales. Deſcribed from the Bankſian cabinet. Fabr.

Carabus *lateralis*. Winged, black; thorax and ſhells margined with ferruginous. An European ſpecies, and inhabits woods. Daldorf.

Carabus *ruficornis*. Winged, black; wing-caſes furrowed, and ſlightly downy; antennæ and legs rufous. Paykull, &c. Common in woods in Europe. Inhabits England. Liſter, Marſham, &c.

Carabus *picicornis*. An Italian ſpecies of the winged kind, with the head, antennæ, and legs rufous. Muſ. Allioni.

Carabus *flavicornis*. Winged, black; margin of the thorax, with the antennæ, and legs yellowiſh. Paykull. Inhabits Saxony. Hybner.

Carabus *fulvipes*. Winged, black; thorax canaliculated; ſhells ſtriated and ſmooth; antennæ and legs ſmooth. Inhabits the woods in Germany. Smidt.

Carabus *piceus*. Winged; thorax grooved with two ſtriæ on each ſide; antennæ and ſhanks of the legs piceous, or pitchy. Linn. and Schæffer. Found in European woods.

Carabus *femoralis*. Winged; head and thorax braſſy; wing-caſes duſky, and ſtriated; thighs rufous. Inhabits Sierra Leona. Bankſian cabinet.

Carabus *terricola*. Winged, black, and gloſſy; wing-caſes with ſmooth ſtriæ; extremity of the antennæ, and the legs rufous. Paykull, Monogr. Inhabits Germany, and is found under ſtones. Fabr.

Carabus *madidus*. Winged; thorax with an impreſſed black dot on each ſide at the baſe; thighs rufous. Paykull. Inhabits England.

Carabus *americanus*. Winged, black; thorax, antennæ, and legs ferruginous. A native of America.

Carabus *janus*. Winged; thorax ferruginous; wing-caſes azure. Fabr. *Carabus bicolor* of Olivier. Inhabits Carolina. Obſ. The antennæ are villous, black, with the firſt joint rufous: head advanced, cylindrical, and brown; body black, with ferruginous feet.

Carabus *fumans*. Winged, entirely ferruginous, except the wing-caſes, which are blue-black. Inhabits America.

Carabus *crepitans*. Winged; head, thorax, and legs ferruginous; wing-caſes black. Linn. Le bupreſte à téte, corcelet et pattes rouges et ètuis bleus. Geoffr.

This is the bombardier of French writers mentioned in the introduction, which is ſaid to poſſeſs the faculty of terrifying its enemies by repeated loud exploſions and fetid vapours emitted from the vent, whence its name crepitans, "Terrefactus crepitu ani hoſtem pellere tentat." This ſingular ſpecies inhabits Europe. Mr. Marſham deſcribes it as a native of this country. Ent. Brit. Fabricius ſpeaks of a variety of this ſpecies about half the ſize, that occurs in Germany.

Carabus *ſclopeta*. Ferruginous; wing-caſes azure; with the future at the baſe ferruginous. Fabr. Found abundant in France under ſtones. It is much ſmaller than C. crepitans; there is a rare variety of it in which the future is the ſame colour as the wing-caſes.

Carabus *ſpinibarbis*. Winged, azure; mouth, antennæ, and ſhanks rufous. Inhabits England. Marſham.

Carabus *æneocephalus*. Winged, bluiſh-black with ſtriated wing-caſes, and a rufous ſpot on the poſterior part. Fabr.

An inhabitant of the South American iſlands, and allied in appearance to the former. The head is braſſy-green, and gloſſy. Antennæ black, with the firſt joint rufous. Thorax heart-ſhaped, punctured, braſſy-green with a ſmall impreſſed line on each ſide at the baſe.

Carabus *humeralis*. Winged, black with ſtriated wing-caſes; ſpot at the baſe, and the legs rufous. Inhabits Italy. Allioni.

Carabus *trilobus*. Winged, braſſy-green; wing-caſes with two white ſpots; antennæ and legs yellow. A native of Guinea. Iſert.

Carabus *multipunctatus*. Winged, ſomewhat braſſy with numerous irregular impreſſed dots. Linn, Paykull, &c. Inhabits Europe.

Carabus *oblongopunctatus*. Winged, black, with ſtriated wing-caſes, and numerous impreſſed dorſal ſpots. Inhabits Germany.

Carabus *varioloſus*. Thorax ſomewhat cordated or heart-ſhaped; black; ſhells azure; baſe of the abdomen and legs rufous. Fabr. Inhabits Auſtria.

Carabus *axillaris*. Ferruginous; ſhells ſtriated, and black, with a pale ſpot at the baſe. Inhabits Auſtria. Fabr.

Carabus *cinctus*. Winged, fuſcous; head and thorax braſſy-green; margins of the wing-caſes, and legs pale. Inhabits Coromandel. Bankſian cabinet.

Carabus *rufipes*. Winged, black; antennæ, legs, and margin of the wing caſes rufous. Fabr. Muſ. Lund. Native place unknown.

Carabus *nitidulus*. Winged, black; margin of the wing-caſes ſhining-braſſy. Inhabits Kamtſchatka. Bankſian cabinet. Obſ. The head and thorax black, gloſſed with coppery; wing-caſes ſtriated, the ſtriæ punctured alternately. Legs black.

Carabus *Dianæ.* Winged, black; wing-caſes ſtriated; lunule at the baſe, and the legs ferruginous. Inhabits Saxony. Hybner, &c.

This is of the middle ſize; head ſmooth, black; antennæ ferruginous. Thorax heart-ſhaped, and grooved; body black; legs ferruginous.

Carabus *agilis.* Winged, rufous; wing-caſes and abdomen black. Paykull. Inhabits Sweden. The crown of the head is black, and the wing-caſes truncated.

Carabus *ruficollis.* Winged; thorax ferruginous; wing-caſes truncated, ſtriated, greeniſh; head flat, and black. Fabr.

Deſcribed as a native of South America from a ſpecimen in the cabinet of Dr. Hunter. It is of the middle ſize; antennæ black, with fuſcous tips; thorax elongated, heart-ſhaped, and ſlightly grooved; wing-caſes ſhining; abdomen black with ferruginous vent; legs black, thighs rufous at the baſe.

Carabus *olens.* Winged; thorax rufous; wing-caſes fuſcous with three rufous ſpots. Inhabits Italy. Boſc.

This inſect very much reſembles a cicindela. The body is of the middle ſize, elongated, and more depreſſed than uſual in the carabus genus. The antennæ are ferruginous, with the firſt joint longeſt, incurvated, and thick at the end; head black and gloſſy, mouth ferruginous; ſhells ſlightly ſtriated; legs rufous.

Carabus *faſciatus.* Winged; thorax rufous; ſhells yellowiſh with a common black band. Paykull, &c. Inhabits Sweden.

Carabus *atricapillus.* Winged; thorax rufous; wing-caſes teſtaceous, and obtuſe; head black. Linn. Inhabits Europe. Conſidered by Fabricius and others as a variety only of Paykull's carabus agilis. It varies frequently in having the margins of the ſhells black. This inſect is found in England.

Carabus *4-puſtulatus.* Winged, yellow, with fuſcous wing-caſes, each marked with two yellow ſpots. Fabr.

Inhabits Africa. Deſcribed from the Bankſian cabinet. This is an inſect of ſmall ſize; its antennæ are fuſcous; thorax heart-ſhaped, yellow with an impreſſed dorſal line; wing-caſes ſlightly ſtriated and truncated.

Carabus *oblongus.* Winged, black; thorax oblong; wing-caſes ſtriated, fuſcous, with yellow antennæ and legs. A native of Germany. Smidt. Obſ. This is a ſmall inſect, with a black ſhining head, and yellow feelers; thorax grooved, black, and ſhining; ſtriæ on the wing-caſes crenated; abdomen pitchy.

Carabus *rubens.* Winged; thorax ferruginous; wing-caſes rounded, teſtaceous, with the head fuſcous. Inhabits Germany. Fabr. This very much reſembles carabus atricapillus; the ſhells are ſtriated, and without ſpots; the head fuſcous.

2d Section. *Thorax narrowed behind.*

Carabus *venator.* Apterous, black, with ſmooth wing-caſes, and a grey ſpot at the baſe. Inhabits Senegal. Olivier. Obſ. The head is advanced, and very large, with each ſide of the front impreſſed; thorax behind with acute margin; wing-caſes glabrous, and ſmooth.

Carabus *ſulcatus.* Apterous, black, with margin of the thorax white; wing-caſes furrowed, margin and three ſpots white. Olivier. This inhabits Senegal, and reſembles the preceding; at the baſe of the wing-caſes is a ſmall oblique white line, a white dot before, another behind the middle, and one at the apex.

Carabus *nimrod.* Apterous, black; wing-caſes furrowed with two remote villous grey ſpots. Olivier. This alſo is a native of Senegal. The body is black; thorax immaculate.

Carabus *10-guttatus.* Apterous, black; ſhells with nine furrows, and ten white dots. Linn. Inhabits Africa. Called by Degeer carabus alboguttatus.

Carabus *6-guttatus.* Apterous, black; wing-caſes ſmooth; with two grey ſpots. Inhabits India. Olivier, Donov. Inſ. Ind. &c. This is of a large ſize; the ſhield is ſquare, and entire: jaws advanced, bent, and pointed; legs black.

Carabus *4-guttatus.* Apterous, black; thorax with two large pitchy tubercles, and a ſmall grey dot on each ſide; wing-caſes furrowed; with elevated carinated lines, and two remote grey ſpots. A native of Africa.

Carabus *7-guttatus.* Apterous, black; above brown; ſhells ſtriated with ſeven white dots. Fabr. Inhabits the Cape of Good Hope.

Carabus *tabidus.* Apterous, black; wing-caſes with rugoſe furrows. Fabricius.

Deſcribed from the Bankſian cabinet as a native of the Cape of Good Hope. Its ſize is about half that of carabus 4-guttatus; the front is grooved on each ſide; thorax with two raiſed dorſal lines on the back part; wing-caſes rather pointed behind; body deep black.

Carabus *nigripennis.* Apterous, rufous; ſhells grooved, and black. Inhabits the Cape of Good Hope. Voet. &c.

Carabus *variegatus.* Apterous; wing-caſes flat and ſmooth, with white ſinuate margin and ſpots on the diſk. A native of the Eaſt Indies, deſcribed by Forſkal. Obſ. The eyes are teſtaceous; lateral margin of the thorax whitiſh; wing-caſes with five white dots in the diſk; body black.

Carabus *exclamationis.* Apterous; margin of the thorax white; wing-caſes with a white margin, line, and dot in the middle. Fabricius. From Barbary.

Carabus *trilineatus.* Apterous, black; edges of the thorax white; wing-caſes whitiſh, with black line and future. Inhabits Germany. Deſcribed by Thunberg under the name of carabus lineatus.

Carabus *cephalotes.* Winged, black, very ſmooth, with convex thorax. Linn.

Carabus *cicindeloides.* Apterous, and black; wing-caſes ovate, flat, ferruginous, and villous edged with white. Inhabits the Cape of Good Hope, Stockh. Tranſ.

Carabus *lævigatus.* Winged, black, depreſſed; thorax and ſhells very ſmooth. Inhabits Coromandel.

Carabus *interruptus.* Winged, black; thorax and wing-caſes remote. Inhabits the Eaſt Indies. Herbſt. Scarites clypeatus. Roſſi.

Carabus *tricuſpidatus.* Winged, black; antennæ, and legs ferruginous; ſhield tricuſpidate. Inhabits Barbary. Muſ. Desfontaines.

Carabus *calydonius.* Winged; head with an obtuſe projecting horn; mandibles horned.

Scarites calydonius, Roſſi. This kind inhabits Italy. The head is large with a large obtuſe compreſſed horn in front; mandibles with a ſtrong recurved tooth; ſhells punctured in ſtriæ.

Carabus *complanatus.* Winged, yellowiſh, with two black bands on the wing-caſes. Linn. Found in St. Domingo.

Carabus *bimaculatus.* Winged, black; head and wing caſes truncated; dot at the baſe, and band in the middle ferruginous. Linn. Inhabits India. Donov. Inſ. Ind. Obſ. The thorax is variable in this ſpecies, being ſometimes yellow, ſometimes black, and not unfrequently ſpotted.

Carabus *tripuſtulatus.* Winged, black; with two yellow ſpots on each wing-caſe, the poſterior ones approximate; legs yellow.

A native of Siam. Size of the laſt ſpecies, and which, as Fabricius intimates, may prove to be only a variety of it. The head is flat, ſmooth, and black, with the mouth teſtaceous; thorax flat, ſmooth, black and without ſpots; wing-caſes ſtriated, black with two large yellow ſpots; the legs yellow, with a ſingle tooth on the anterior ſhanks.

Carabus 6-*puſtulatus*. Rufous with black wing-caſes, and three red dots. Inhabits the Eaſt Indies. Edler.

The head and thorax are rufous; wing-caſes ſtriated, and black, the red ſpot at the tip lunate; abdomen rufous with black margin; legs rufous.

3d Section. *Thorax ſquare.*

Carabus *varioloſus*. Apterous, black; ſhells ſprinkled with irregular impreſſed dots.

Inhabits Tranſylvania. Saldoner. It is of a large ſize, and entirely black: antennæ black with fuſcous tips; thorax margined; ſhells connected, and variouſly ſprinkled with large irregular impreſſed dots, ſome of which are confluent.

Carabus *ſtriola*. Apterous, depreſſed; black; two impreſſed lines on each ſide of the thorax at the baſe; ſhells ſtriated. Fabr.

Much allied to carabus leucophthalmus, but is broader, and more depreſſed; the colour is entirely black. Inhabits Saxony.

Carabus *metallicus*. Apterous, black, with a ſmall impreſſed line on each ſide of the thorax at the baſe; thorax and ſhells braſſy. A native of Saxony. Smaller than the preceding. Head black; feelers ſomewhat ferruginous; thorax braſſy, ſhining, and grooved in the middle; ſhells ſlightly ſtriated; body black. There is a variety of it with duſky thorax; and coppery ſhells. Hybner, &c.

Carabus *politus*. Winged, gloſſy-black; wing-caſes ſtriated; antennæ rufous. Inhabits the Eaſt Indies.

Deſcribed from the cabinet of Lund. In ſize and appearance it much reſembles C. leucophthalmus; the head is large and exſerted; antennæ rufous with the firſt joint black; lip heart-ſhaped; jaws ſtrong and thick at the extremity; thorax grooved; body black.

4th Section. *Thorax rounded, with a ſlightly prominent obtuſe margin.*

Carabus *alternans*. Apterous, black; ſhells with reticulated ſtriæ, which are broader alternately, and marked with a triple ſeries of elevated braſſy-dots retuſe at the tip. Fabricius.

This inſect reſembles the next ſpecies; the antennæ are black, cinereous at the tip; head large; eyes globular, prominent, and teſtaceous; thorax black, and immaculate; ſhells deeply ſtriated, and interſected with ſmaller ones, the longitudinal ſtriæ alternately broader; and three ſtreaks of oblong raiſed braſſy dots; legs black. Inhabits South American iſlands.

Carabus *calidus*. Apterous, black; ſhells with crenated ſtriæ; the ſtriæ equal, and marked with a triple row of indented golden dots. Inhabits South American iſlands. Muſ. von Rohr. Obſ. The antennæ are reddiſh at the tip, and on each ſide near the baſe of the wing-caſes is a ſingle golden dot.

Carabus *ſericeus*. Apterous, black; an impreſſed dot on each ſide the thorax at the baſe; ſhells ſomewhat ſtriated, with a triple row of braſſy dots. Inhabits Germany. Smidt. Allied to the two preceding, but diſtinct. The antennæ are black, at the tip fuſcous; head black; thorax and body black. Fabr.

Carabus *porcatus*. Apterous, black; ſhells ſtriated and granulated at the tip.

Inhabits New Holland, and is deſcribed by Fabricius from a ſpecimen in the Bankſian cabinet. This is of a moderate ſize.

Carabus *reflexus*. Apterous, black; wing-caſes furrowed, with two yellow ſpots. Inhabits Coromandel. Obſ. The head is black, and impreſſed on each ſide; thorax unequally punctured, and ſlightly reflected at the edge; ſhells connected, with eight grooves; legs black.

Carabus *angulatus*. Apterous, hairy, and black; thorax canaliculated; ſhells grooved, with two interrupted yellow bands. Inhabits Coromandel. Fabr.

Carabus *caſſideus*. Apterous, black; thorax margined; ſhells ſmooth. Found in France. Boſc.

Carabus *ſilphoides*. Apterous, black, with margined thorax; ſhells ſtriated, punctured, with rows of larger punctures. Inhabits France and Italy. Roſſi.

Carabus *globoſus*. Apterous, black, with convex thorax, and ſtriated ſhells. A native of Morocco. Scheſtedt.

Carabus *indagator*. Apterous; ſhells very ſmooth, with a triple row of braſſy dots. Inhabits Barbary. Believed to be the *carabus auropunctatus* of Paykull.

Carabus *ſycophanta*. Winged; gloſſy-violet; wing-caſes golden and ſtriated. Linn. Inhabits woods in Europe.

Carabus *inquiſitor*. Winged; wing-caſes ſtriated, braſſy-green, with a triple ſeries of dots. Linn. A native of Europe, and frequents woods.

Carabus *ſcrutator*. Winged; wing-caſes ſtriated, greeniſh, with a triple ſeries of dots; thorax azure; margin reflected and golden. Inhabits Virginia. Fabricius.

Carabus *reticulatus*. Winged, black; wing-caſes reticulated, braſſy-green; the margin of the thorax greeniſh. Inhabits Europe. Zſchuck.

In ſize and appearance reſembles carabus inquiſitor; the antennæ are black, with the laſt joint ferruginous; wing-caſes very finely reticulated.

Carabus *longicornis*. Winged, black; head and thorax dotted; wing-caſes with crenated ſtriæ; antennæ and legs ferruginous. A native of Morocco. Fabr. Obſ. The antennæ are nearly as long as the body, whence its ſpecific name longicornis: the head is black, with ferruginous feelers; thorax rounded at the ſides, dotted, and black; wing-caſes black, and without ſpots; thighs blackiſh.

Carabus *brevicollis*. Winged, black, with ferruginous antennæ.

This inſect inhabits Germany. Helwig.

Carabus *rotundicollis*. Pitchy-ferruginous; ſhells paler antennæ and legs pale teſtaceous. Inhabits England. Marſh. Ent. Brit.

Carabus *ochropus*. Pitchy black; antennæ and legs pale teſtaceous. A native of England. Marſham.

Carabus *punctulatus*. Winged, depreſſed, black; ſhells punctured, ſlightly ſtriated, and retuſe at the baſe. Inhabits Saxony. Paykull, &c.

The head is ſmooth and black; antennæ ſhort and browniſh; thorax ſmooth, black, and immaculate; wing-caſes nearly ſmooth; body black; ſhanks of the legs ſpinous.

Carabus *obſcurus*. Black and winged; thorax dotted; wing-caſes ſtriated; legs piceous. Inhabits Saxony, Hybner; and England, Marſham. Rather larger than carabus ruficornis.

Carabus *micans*. Winged; ſhells ſhining gold with a teſtaceous ſpot at the tip; legs rufous. Country unknown. Boſc. Obſ. The head is ſmooth and coppery; thorax grooved, and gloſſed with green; body black.

Carabus *bicolor*. Winged; above black, beneath ferruginous. Inhabits North America. This reſembles carabus obſcurus, but differs in having all the lower ſurface with the legs and antennæ ferruginous.

Carabus *holoſericeus*. Winged, ſilky-black; head braſſy and ſhining. Fabr. Obſ. The head is braſſy, with the mouth and antennæ black; wing-caſes ſtriated: legs black.

Carabus *ſulcatus*. Winged, black; thorax variolous; wing-caſes grooved, with a ferruginous ſpot in the middle. Found at the Cape of Good Hope. Fabr.

Carabus 2-*notatus*. Winged, black; head with two rufous dots in front; antennæ yellow at the baſe. Inhabits Germany. Daldorf.

The body of this ſpecies is entirely black; head ſmooth and gloſſy; thorax ſmooth; wing-caſes ſtriated; legs variable from red to black.

Carabus *fulvicollis*. Winged, azure; mouth, thorax, and thighs rufous; wing-caſes ſtriated, and truncated. Inhabits Barbary. Fabr.

Carabus *pilicornis*. Winged; ſhells ſtriated with impreſſed dots; antennæ hairy. Fabr. Inhabits England. Donov. Brit. Inſ.

Carabus *ſemipunctatus*. Winged; thorax roundiſh; wing-caſes fuſcous, ſtriated, with anterior hyaline ſpots, and dots on the poſterior half. A new ſpecies lately diſcovered in South Wales. Donov. Tour. 1805.

Carabus *cæruleſcens*. Winged, bluiſh black, with ſtriated wing-caſes; antennæ at the baſe red. Linn. *Carabus virens*. Myller. Obſ. This ſpecies varies in colour from bluiſh to braſſy, coppery and green.

Carabus *lepidus*. Winged, braſſy-green; thorax with two ſtriæ on each ſide; wing-caſes ſtriated. Fabr. *Carabus lepidus*. Leſke. Itin. A native of Europe.

Carabus *ſchach*. Winged, black, with ſtriated wing-caſes, and a large oblong ſpot behind; antennæ and legs rufous.

This kind inhabits South America, and reſembles in ſize and appearance carabus pilicornis. The head is black; ſtriæ on the wing-caſes crenated; body black.

Carabus *cupreus*. Winged, coppery; baſe of the antennæ red. Linn. Inhabits woods in Europe.

Carabus *carnifex*. Winged, braſſy-green; antennæ and legs rufous. Found in Terra del Fuego. Bankſian Cabinet.

This is of a ſmall ſize; head braſſy, and ſhining; mouth ferruginous, poſterior part of the thorax with an impreſſion on each ſide; wing-caſes ſtriated, and ſubretuſe at the tip.

Carabus *vulgaris*. Winged, braſſy-black; antennæ and legs black. Linn. Very common in ſandy places in Europe. Obſ. This is *carabus ovatus* of Roſſi, Helw. &c. and *carabus affinis*, Schrank.

Carabus *communis*. Winged, braſſy; antennæ at the baſe and the ſhanks rufous. Marſham, Panzer. Rather ſmaller than the former, and is found in ſimilar ſituations. Panzer ſpeaks of a variety that has the legs entirely rufous inſtead of the ſhanks only.

Carabus *ovatus*. Winged, black; ſhells ſtriated and ſmooth; antennæ and legs ferruginous. Fabricius. Inhabits Saxony.

Carabus *latus*. Winged, black; ſhells with crenated ſtriæ, antennæ and legs ferruginous. Linn. Inhabits Europe. The ſpecies is ſometimes found in England, in woods.

Carabus *abdominalis*. Winged, black; antennæ, diſk of the abdomen, and legs ferruginous. Inhabits the Cape of Good Hope. Fabr.

Reſembles the former in ſize and aſpect; the head is black; feelers ferruginous; thorax ſmooth and black; ſhells ſtriated, black, and without ſpots.

Carabus *helopioides*. Winged, black; wing-caſes with ſmooth ſtriæ; antennæ and legs black. A native of Germany. Helwig. Entirely reſembles the Fabrician *carabus ovatus*, except in being totally black.

Carabus *azureus*. Winged, azure; antennæ and legs red. Bergſtr. Nomencl. Inhabits Germany.

Carabus *erythrocephalus*. Winged, black; head rufous; antennæ and legs yellow. Fabr.

This is a native of Germany, and is of a moderate ſize; the thorax is black and gloſſy; wing-caſes ſtriated and black.

Carabus *analis*. Winged, black; mouth, antennæ, vent, and legs ferruginous. Fabr. This reſembles the former in ſize and aſpect; the head is black; thorax black, with an impreſſed dorſal line, and two little impreſſed lines at the baſe; wing-caſes black, with crenated ſtriæ. Inhabits Germany. Smidt.

Carabus *lineola*. Winged, ferruginous, with a ſmall black line on the wing-caſes. Deſcribed from the Bankſian Cabinet. The ſpecies inhabits North America.

Carabus *ferrugineus*. Winged, ferruginous, and entirely convex. Marſh. Inhabits England, and the reſt of Europe. C. *ferrugineus* of Linn. Paykull, &c.

Carabus *ruſimanus*. Winged, black, and convex; antennæ and ſoles of the feet ferruginous. Marſh. Inhabits England.

Carabus *paliens*. Winged, pale, with ſtriated wing-caſes. Fabr. Is found in Saxony.

Carabus *Surinamenſis*. Winged, teſtaceous; thorax and wing-caſes ſtriated and fuſcous. Inhabits Surinam.

Carabus *dorſiger*. Winged, ferruginous; ſhells with a broad black lunule; abdomen black. Fabr.

This is a native of Barbary. The head is duſky; ſhells ſtriated; legs ferruginous.

Carabus *aterrimus*. Winged; thorax margined, black; wing-caſes black, ſtriated, with three impreſſed dots. Inhabits woods in Europe. Fabr. &c.

Carabus *æneus*. Winged, above braſſy; antennæ and legs ferruginous. Fabr. This is an European ſpecies, and inhabits England. The body varies from black to ferruginous.

Carabus *nigricornis*. Winged, green, downy, with numerous punctures; thorax ſhining golden; wing-caſes with obſolete ſtriæ and duſky; legs piceous. Marſh. Inhabits England. Obſ. This is *carabus nitidulus* of Thunberg.

Carabus *parumpunctatus*. Winged, oblong, and braſſy above; beneath black; wing-caſes ſtriated, with ſix impreſſed dots; ſhanks piceous. Fabr. Found in Germany.

Carabus 6-*punctatus*. Winged; head and thorax greeniſh; wing-caſes coppery. Linn. An European ſpecies.

Carabus *diſcoideus*. Winged, black, outer margin of the wing-caſes, with the antennæ, rufous. Inhabits Germany. Smidt.

Carabus *marginatus*. Winged, green, margin of the wing-caſes and the ſhanks teſtaceous. Linn. Inhabits woods in Europe.

Carabus *veſtitus* of Paykull and Fabricius is ſuppoſed to be a variety of the Linnæan *carabus marginatus*. It is of the winged kind, green-braſſy colour, with the edges of the thorax, and wing-caſes, with the antennæ and legs pale. Geoffr. Fabr. &c. Inhabits Hungary.

Carabus *pallipes*. Winged, black; border of the thorax and wing-caſes, with the legs pale. Deſcribed by Fabricius from the Hunterian Muſeum, as a native of America. Obſ. The antennæ are black pale at the baſe; head black, with ferruginous mouth; ſhells ſtriated; body black.

Carabus *fuſcus.* Winged, fuſcous; wing-caſes obſoletely ſtriated; antennæ, margin of the thorax, and legs yellow. Inhabits Germany.

Carabus *nigrita.* Winged, black and gloſſy; thorax caniculated; wing-caſes ſtriated. A native of Europe.

Carabus *quadrum.* Winged; thorax rounded, black; wing-caſes ſtriated with a pale ſtripe. Inhabits Senegal. Boſc.

Carabus *melanocephalus.* Winged; thorax and legs ferruginous; head and wing-caſes black. Linn. Paykull, &c.

This is *bupreſtris dorſo rubro* of Panzer, and *le bupreſte noir à corcelet rouge* of Geoffr. Found in woods of Europe, and in England. The head is black; wing-caſes deep black, and ſtriated; thorax red. Linn. Fn. Su.

Carabus *cyanocephalus.* Winged; thorax and legs ferruginous; head and wing-caſes blue. Linn. Inhabits European woods, and is found in England. Donov. Brit. Inſ.

Carabus *rufibarbis.* Winged, black; antennæ, mouth and legs rufous. Found in Germany. Smidt. Size of the preceding; body black and gloſſy; thorax ſlightly canaliculated; wing-caſes ſtriated; mandibles of the mouth black.

Carabus *lividus.* Winged, yellowiſh; head and thorax black; wing-caſes fuſcous and ſtriated. Inhabits Denmark. Lund. This inſect is of a ſmall ſize. The mouth is black; antennæ pale; thorax ſmooth, black, and without ſpots; body and legs yellowiſh.

Carabus *amethyſtinus.* Winged, azure; head and thorax ſhining-braſſy. Fabr.

Deſcribed as a native of Cayenne, from the cabinet of Von Rohr. The antennæ are hairy, brown, with ferruginous baſe; wing-caſes ſtriated; body azure.

Carabus *crux-major.* Winged; thorax orbiculate; wing-caſes black, with two rufous ſpots. Linn.—Thorax yellow, glabrous; wing-caſes behind black, with two yellow ſpots. *Carabus crux-minor.* Marſh. Ent. Brit. *Carabus crux-major.* Fabricius. Inhabits Europe. Obſ. *Carabus bipuſtulatus* of Fabricius, which that author deſcribes as an Engliſh ininſect, and refers to the cabinet of Lee, is this ſpecies.

Carabus *crux-minor.* Winged; thorax orbiculate and rufous; ſhells truncated and red, with a black croſs. Linn. *Carabus crux-major.* Marſh. Ent. Brit. *Le chevalier noir* of Geoffr. and *Bupreſtis cruciata* of Panzer. This inhabits European woods, and is, as well as the preceding ſpecies, found in England, but rarely.

Carabus *vittatus.* Winged; thorax orbiculate, and rufous; wing-caſes black, with a white ſtripe. Inhabits North America. Fabricius. Obſ. The antennæ of this are black; head rufous; ſcutel ſmall, and of the ſame colour; wing-caſes glabrous, with a longitudinal white ſtripe on a black ground; margin rufous; body ferruginous with black legs.

Carabus *turcicus.* Winged; thorax orbiculate and rufous; wing-caſes black, with a pale lunule at the baſe.

The country of this inſect, which Fabricius deſcribes from the Hunterian Collection, is unknown. The head is black; mouth and antennæ reddiſh; thorax margined, and without ſpots; wing-caſes ſtriated, ſlightly truncated, black; abdomen black; legs pale.

Carabus *hæmorrhoidalis.* Winged; thorax ſomewhat orbiculated, and rufous; wing-caſes black, and rufous at the tip. Found at Dreſden. Muſ. Romanus. The antennæ are rufous, blackiſh at the tip; head and thorax without ſpots; wing-caſes ſlightly ſtriated, and the body black.

Carabus *picipes.* Winged; thorax orbiculated, gloſſy-black; wing-caſes fuſcous, with ferruginous legs. Inhabits Sweden. Paykull.

Carabus *andreæ.* Winged; thorax orbiculated, ſhining-black; wing-caſes pale, with a black ſpot in the middle. Inhabits Italy. Dr. Allioni.

Carabus *elevatus.* Rufous; wing-caſes ſilky and pale, with a common black band. Found in France. Boſc.

Carabus *germanus.* Winged, azure; head, wing-caſes, and legs teſtaceous. Linn. Inhabits woods of Germany. Schæffer.

Carabus *velox.* Winged, blackiſh, antennæ and legs pale; wing-caſes very obtuſe. Linn. Found in ſandy places in Europe.—Obſ. The wing-caſes are ſtriated, obtuſe, and almoſt truncated.

Carabus *rufeſcens.* Winged, ferruginous, crown of the head and tail black. Fabr. An Engliſh ſpecies in the Hunterian Collection. It is of a ſmall ſize, and entirely ferruginous, except the crown and tail. *Carabus rufeſcens* of Paykull.

Carabus *præuſtus.* Winged, teſtaceous; crown of the head, tip of the wing-caſes, and the abdomen black. Inhabits Germany. Smidt. Obſ. This is of an oblong figure; the mouth and antennæ are teſtaceous; thorax rounded, ſmooth, and without ſpots; ſhells ſtriated; body teſtaceous, with black abdomen; legs teſtaceous.

Carabus *apricarius.* Black above, beneath ferruginous; wing-caſes with crenated ſtriæ. Paykull, Monogr. Inhabits the ſandy plains of Dalekarlia. Suppoſed to be the *carabus fulvus* of Geoff. and Degeer.

Carabus *lunatus.* Winged; thorax orbiculate and rufous; ſhells yellow, with three black ſpots. Fabr. *Carabus eques*, Schrank, Beytr. This inſect is found in England.

Carabus *praſinus.* Winged, black: head and thorax braſſy; wing-caſes ferruginous, with a large, common, black ſpot at the tip. Inhabits Europe. Fabr. *Carabus veridanus* of Paykull.

Carabus *curſor.* Winged; thorax braſſy-green; ſhells black, with a ferruginous ſpot at the tip. Inhabits Italy. Dr. Allioni.

Carabus *furcatus.* Livid; wing-caſes with a black abbreviated line in the middle, forked at the baſe.

This is of a ſmall ſize, and inhabits America. The head is duſky, with a black ſpot between the eyes, and the wing-caſes are ſtriated.

Carabus *diſcus.* Winged; thorax rufous; head black; wing-caſes teſtaceous, with a common dorſal fuſcous ſpot. Inhabits Germany. Smidt. Obſ. This is ſmall, and has the mouth and antennæ black; thorax rounded; wing-caſes ſtriated; legs rufous.

Carabus *meridianus.* Winged, black; anterior part of the wing-caſes and the legs teſtaceous. Linn. *Caralus meridianus,* Paykull. Inhabits ſandy places in Europe.

Carabus *vaporariorum.* Winged; thorax, anterior part of the wing-caſes, with the margin, antennæ, and legs ferruginous. Linn.

Carabus *comma.* Winged, black, with fuſcous thorax; wing-caſes grey, with a linear black ſpot. Inhabits America. Drury.

Carabus 4-*maculatus.* Winged; thorax ferruginous and glabrous; wing-caſes very obtuſe and fuſcous with two white ſpots. Linn.

Carabus 4-*guttatus.* Winged; thorax deep black; ſhells black, with two white dots on each. Deſcribed by

Fabricius as an Engliſh inſect. *Carabus 4-guttatus* of Paykull.

Carabus *uſtulatus.* Winged; thorax black; wing-caſes duſky, with two pale bands. Inhabits Europe. *Carabus dentellus*, Thunberg, and *Elophorus rupeſtris*, Fabr. Mant. &c.

Carabus *dorſalis.* Winged; thorax black; ſhells pale, with a large black dorſal ſpot. Fabr. Inhabits Germany.

Carabus *biguttatus:* Winged; thorax braſſy; wing-caſes black, with a pale ſpot at the tip. Inhabits woods of Norway.

Carabus *guttula.* Winged, deep black, with a white hyaline ſpot on the poſterior part of the wing-caſes. A native of Germany. Smidt. *Carabus riparius* of Paykull.

Carabus *teſtaceus.* Winged; head and thorax ferruginous; wing-caſes teſtaceous. Linn. Found in Europe.

Carabus *truncatus.* Winged; thorax ferruginous; wing-caſes ſtriated, abbreviated, and black. Inhabits Saxony. Hybner.

Carabus *bipunctatus.* Winged, braſſy; antennæ and legs black; ſhells with two impreſſed dots. Linn. An European ſpecies.

Carabus *abbreviatus.* Winged; thorax rufous; wing-caſes abbreviated and teſtaceous. Found among the rocks of Norway. Fabr.

Carabus *celer.* Winged, braſſy, and ſhining; legs ferruginous. Found among moſſes in Europe. Fabr.

Carabus *minutus.* Winged, black; ſhells and legs piceous. Inhabits Germany, and lives in the trunks of trees. Smidt.

Obſ. This, as the name implies, is a ſmall ſpecies. The head is black; antennæ piceous; thorax roundiſh, black, and without ſpots; wing-caſes ſtriated; body black, and legs ferruginous.

Carabus *pygmæus.* Winged; above ſhining-braſſy; beneath deep black. Inhabits Germany. Smidt.

Carabus *triſtis.* Winged, black, with rufous legs. Found in Germany. Smidt. Obſ. Small; antennæ entirely black; head and thorax glabrous and black; wing-caſes ſtriated. Paykull ſpeaks of a variety of this inſect with piceous legs, which he ſays is found in Sweden.

Carabus *truncatellus.* Winged; above duſky-braſſy; beneath deep black; wing-caſes obtuſe. Linn. Inhabits Europe. Size ſmall; antennæ and legs deep black.

Carabus *minimus.* Winged, deep black, with ſtriated ſhells. Inhabits Germany. Smidt. Obſ. This is very ſmall; head and thorax black, and without ſpots; antennæ and legs black.

### 5th Section. *Thorax various, or uncertain.*

Carabus *ruguloſus.* Apterous, thorax angulated behind, braſſy; ſhells greeniſh, fore-part ſtriated; tip and margin rugoſe. Marſh. Inhabits England.

Carabus *gibboſus.* Thorax truncated behind, and entire; ovate, convex, gibbous; wing-caſes with crenated ſtriæ; legs and antennæ piceous. Marſh. Taken near Colcheſter, by the late Mr. Curtis, on *Rubo fruticoſa.*

Carabus *rufangulus.* Thorax truncated behind, and entire, black; wing-caſes duſky; antennæ and legs ferruginous; margin of the thorax rufous. Inhabits England. Marſh.

Carabus *tibialis.* Gloſſy black; ſhanks and ſoles of the feet piceous, ferruginous. Found in England. Marſh.

Carabus *convexus.* Black; wing-caſes ſtriated; ſtriæ dotted; antennæ ferruginous; legs piceous. An Engliſh ſpecies. Marſh.

Carabus *diſcolor.* Above ſhining-azure; beneath ferruginous. A new Engliſh ſpecies. Marſh.

Carabus *immunis.* Blue-black, with teſtaceous legs. Inhabits England. Marſh.

Carabus *echinatus.* Ferruginous and hiſpid; head and thorax duſky, punctured; wing-caſes ſtriated, with a large black ſpot. Inhabits England. Marſh.

Carabus *lateralis.* Black; ſides of the thorax behind ferruginous; legs pale. A native of England. Marſh.

Carabus *punctomaculatus.* Black, ſmooth, and gloſſy; ſhells truncated, with two white ſpots. Inhabits England. Marſh.

Carabus *acutus.* Braſſy-black and very gloſſy; wing-caſes ſomewhat attenuated, and pointed; ſhanks pale. Inhabits England. Marſh.

Carabus *femoralis.* Duſky-black; wing-caſes ſomewhat truncated at the tip; thighs pale at the baſe. Inhabits England. Marſh.

Carabus *dilutus.* Pale ferruginous; eyes black; legs pale teſtaceous. Inhabits England. Marſh.

Carabus *elegantulus.* Black; antennæ ferruginous; wing-caſes and legs teſtaceous. An Engliſh ſpecies. Marſh.

Carabus *ochropus.* Piceous-black; antennæ and legs pale teſtaceous. Inhabits England. Marſh.

Carabus *rugimarginatus.* Ferruginous-black, and rather depreſſed; ſtriæ on the wing-caſes deeply punctured; margin of the thorax rough with dots. Inhabits England. Marſh.

Carabus *circulatus.* Black; antennæ, legs, and margin of the ſhells teſtaceous. Found under ſtones by the ſide of the river Uſk, near Crickhowell, Monmouthſhire. Marſh.

Carabus *purpureo-cæruleſcens.* Bluiſh-black; wing-caſes ſtriated, with numerous punctures between the ſtriæ; antennæ, feelers, and legs rufous. Found near Maldon in Eſſex. One of the new Engliſh ſpecies deſcribed by Mr. Marſham. Ent. Brit.

Carabus *nitidulus.* Bluiſh-black and gloſſy; antennæ at the baſe, ſhanks, and tarſi reddiſh; wing-caſes ſtriated with punctures. Marſh. Inhabits England.

Carabus *pulchellus.* Bluiſh-black and gloſſy; legs reddiſh; ſhells ſtriated with dots. Marſh. Inhabits England.

Carabus *ruficollis.* Black; head black and gloſſy; antennæ, thorax, and legs rufous-ferruginous. Inhabits England. Marſh.

Carabus *fulvus.* Ferruginous; legs paler; eys black. Inhabits England, and varies in having the legs more or leſs pale.

Carabus *inæqualis.* Black; antennæ and legs rufous. Inhabits England. Marſh.

Carabus *foraminuloſus.* Piceous, thorax dotted; ſhells ſtriated; legs ferruginous. Inhabits England. Marſh.

Carabus *nigriceps.* Ferruginous; head black; thorax very glabrous, and ſomewhat obcordated. Inhabits England. Marſh.

Carabus *linearis.* Ferruginous-fuſcous; wing-caſes paler, abbreviated, and truncated at the tip; legs pale. Olivier, &c. Inhabits England. Marſh.

Carabus *leproſus.* Blue; baſe of the antennæ, and legs ferruginous; ſhells brown, with two white ſpots. Inhabits Denmark. Pontopp.

Carabus *Inderienſis.* Duſky-green, beneath black; legs teſtaceous; ſhells ſtriated, the lateral margin yellowiſh-grey. Inhabits Siberia. Pallas.

Carabus *aiacer.* Apterous, black, and without ſpots;

thorax rounded behind and grooved. Inhabits the Cape of Good Hope. Thunberg.

Carabus *lunulatus*. Apterous, black; thorax lunated; wing-caſes ſtriated. Thunberg. Inhabits the Cape of Good Hope. Obſ. This is about the ſize of *Carabus violaceus*, but broader and more depreſſed.

Carabus *diſſormis*. Apterous, black; thorax tranſverſe, truncated behind; ſhells ſtriated. Thunberg. An African ſpecies, found at the Cape of Good Hope. Size of C. *hortenſis*.

Carabus *dorſalis*. Black; antennæ and wing-caſes red, with a black margin. Inhabits the Cape of Good Hope. Thunberg.

Carabus *aduſtus*. Thorax and wing-caſes fuſcous; head, antennæ, and legs red. Found at the Cape of Good Hope. Thunberg.

Carabus *afer*. Black; antennæ and legs reddiſh; wing-caſes ſmooth. Thunberg. Inhabits the Cape of Good Hope. Same ſize as *Carabus vulgaris*.

Carabus *Capenſis*. Ferruginous; thorax and ſuture of the ſhells with a longitudinal black line. Inhabits the Cape of Good Hope. Thunberg. Obſ. The body is glabrous; abdomen black or ferruginous.

Carabus *faſcialis*. Ferruginous; ſhells with a black band. Inhabits the Cape of Good Hope. Thunberg. This is very cloſely allied to *Carabus faſciatus*, and may be the ſame ſpecies.

Carabus *fimbriatus*. Apterous, black; ſides of the thorax, and margin of the wing-caſes downy white. An African ſpecies. Herbſt.

Carabus *Herbſtii*. Shells tranſverſely undulated with three rows of golden dots. Inhabits Germany.

Carabus *Pomeranus*. Coppery, beneath black; ſhells with three rows of raiſed dots, and decuſſate ſtriæ. A native of Pomerania. Herbſt.

Carabus *cylindricus*. Black, cylindrical; thorax narrowed, and grooved in the middle; ſhells with nine grooves, and dotted on the outer margin. Herbſt.

Carabus *marchicus*. Beneath black; head and thorax light grey; feelers and antennæ brown, ferruginous at the baſe. Inhabits Pruſſia. Herbſt.

Carabus *ſplendidus*. Brown; head and thorax braſſy-green; legs pale. Inhabits India. Herbſt.

Carabus *mango*. Piceous; legs ſpinulous; antennæ and margin of the thorax yellowiſh; ſhells with eight ſtriæ. Inhabits India. Herbſt.

Carabus *Friſchii*. Black; thorax with a ſingle groove, and eight furrows on the wing-caſes. Inhabits Pruſſia. Herbſt. Gmel.

Carabus *Indicus*. Black; antennæ grey at the tip; thorax with an impreſſed line; wing-caſes with ſeven grooves. Inhabits India. Herbſt.

Carabus *Mulleri*. Braſſy-black; wing-caſes ſtriated and punctured with three impreſſed dots. Inhabits Europe. Herbſt. Gmel.

Carabus *atratus*. Entirely gloſſy-black: thorax rounded; ſhells obſoletely ſtriated, with four indented dots at the ſuture. Inhabits Pruſſia. Herbſt. Gmel.

Carabus *fuſco-rufus*. Reddiſh-brown; ſhells ſtriated; thorax rounded. Inhabits Germany. Herbſt. ap. Fueſsli.

Carabus *lapideus*. Black, beneath brown; ſhells blue, with nine punctured ſtriæ, the outermoſt crenated. Inhabits Pruſſia. Herbſt. ap. Fueſsli.

Carabus *platys*. Totally black; thorax ſlightly margined; ſhells glabrous, and obſoletely ſtriated. Inhabits Pruſſia. Herbſt. ap. Fueſsli.

Carabus *virgo*. Black; antennæ and legs brown; thorax ſinuated behind; ſhells obſoletely ſtriated. Inhabits Pruſſia. Herbſt. ap. Fueſsli.

Carabus *glaber*. Gloſſy-black; ſhells brown, ſtriated; mouth, feelers, and legs piceous. Inhabits Pruſſia. Herbſt. ap. Fueſsli.

Carabus *globator*. Black; thorax hemiſpherical; ſhells ſtriated with punctures; mouth and feelers ferruginous; antennæ fulvous, and nearly moniliform at the baſe. Inhabits Pruſſia. Herbſt. ap. Fueſsli.

Carabus *lampros*. Gloſſy, very ſmooth, braſſy-black; beneath black; wing-caſes ſtriated with punctures; antennæ grey; legs brown. Inhabits Pruſſia. Herbſt. ap. Fueſsli.

Carabus *pyropus*. Gloſſy-black; margin of the thorax raiſed; antennæ and legs piceous. Inhabits Pruſſia. Herbſt. ap. Fueſsli.

Carabus *micros*. Bay-brown; ſhells ſtriated with punctures: eyes black. Inhabits Pruſſia. Herbſt. ap. Fueſsli.

Carabus *chalcos*. Braſſy; beneath black; antennæ ferruginous at the baſe; wing-caſes ſtriated with punctures. Inhabits Pruſſia. Herbſt. ap. Fueſsli.

Carabus *mixtus*. Pale yellow; head black; poſterior part of the wing-caſes ſpeckled with black. Herb. ap. Fueſsli. Inhabits Pruſſia.

Carabus *ſpinoſus*. Apterous, black; ſhells with eight grooves, and roughly dotted, poſterior part ſpinous. Inhabits the Cape of Good Hope. Voet.

Carabus *Thunbergii*. Wing-caſes teſtaceous, with a common violet ſpot; head and thorax black. Inhabits Upſal. Upſ. Tranſ.

Carabus *Upſalienſis*. Wing-caſes green, ſtriated; thorax flat, braſſy, and punctured. Inhabits Upſal. Upſ. Tranſ.

Carabus *pictus*. Depreſſed, teſtaceous; ſtriæ on the wing-caſes and the legs grey. Found by Pallas in the ſandy deſerts of Siberia, under carrion.

Carabus *didymus*. Bluiſh-black; wing-caſes yellow, with a double fuſcous ſpot. Inhabits Denmark. Müll.

Carabus *minimus*. Thorax ſomewhat black; wing-caſes ſtriated; legs and antennæ fuſcous. Inhabits Denmark, infeſts plants, and is ſcarcely larger than a flea. Müll. Fn. Fridrichſd.

Carabus *flavus*. Yellow; wing-caſes ſtriated; head, thorax, and ſpot at the tip of the wing-caſes green. Inhabits Denmark. Müll.

Carabus *feneſtratus*. Black; wing-caſes fuſcous, with oblique, yellow, ſemi-tranſparent ſpots. Inhabits Denmark. Müll.

Carabus *inflexus*. Black; ſhanks and joints of the feet piceous; wing-caſes with a flexuous ſeries of impreſſed dots. Inhabits Denmark. Müll.

Carabus *flavipes*. Black; wing-caſes braſſy; legs and antennæ fulvous. Inhabits Denmark. Müll.

Carabus *nigricans*. Black; wing-caſes, antennæ, feelers, and legs piceous. Inhabits Denmark. Müll.

Carabus *cæruleus*. Black; wing-caſes azure; antennæ, feelers, and legs fulvous. Inhabits Denmark. Müll.

Carabus *ſimilis*. Black; poſterior part of the thorax excavated at both ſides; ſtriæ of the wing-caſes ſlightly dotted. Inhabits Denmark. Müll.

Carabus *æſtivus*. Yellow; head ferruginous; thorax and wing-caſes black. Inhabits Denmark. Müll.

Carabus *flexilis*. Yellowiſh; head black; wing-caſes livid. Inhabits Scandinavia. Müll.

Carabus *lugubris*. Black, opake; antennæ and feelers fulvous; ſhanks and tarſi ferruginous. Inhabits Europe. Müll.

Carabus *pubeſcens*. Black, downy; wing-caſes ſtriated; antennæ, feelers, and legs fulvous. Inhabits Europe. Müll.

Carabus *lævis*. Braſſy; head and thorax green; wing-caſes coppery; legs piceous. Inhabits Denmark. Müll.

Carabus *vernalis*. Black; antennæ, feelers, and legs yellow; wing-caſes ſtriated with dots. Müll.

Carabus *pullus*. Black; wing-caſes ſtriated; legs piceous. Inhabits Denmark. Müll.

Carabus *aurichalceus*. Yellowiſh, above braſſy. Inhabits Denmark. Müll.

Carabus *rubicundus*. Apterous, beneath black; thorax violet; wing-caſes reddiſh, the ſuture and margin white. Lepechin. Inhabits Ruſſia.

Carabus *Forſteri*. Black; head, thorax, and ſhells gloſſy-green; antennæ and legs rufous. Inhabits America. Forſter.

Carabus *lineatus*. Thorax ferruginous; wing-caſes grey, with a common black line at the ſuture, and another in the middle; legs grey; tarſi black. Inhabits America. Forſter.

Carabus *fulvicornis*. Black; wing-caſes with ſmooth ſtriæ, the outermoſt punctured; feelers, antennæ, and legs pale yellow. Inhabits Europe. Hoppe.

Carabus *adſperſus*. Apterous; above braſſy-green, beneath black; wing-caſes with four rows of indented golden dots and raiſed lines. Inhabits Europe. Degeer. Gmelin.

Carabus *varius*. Above braſſy-black, beneath black; body ovate and ſhort; thorax convex; wing-caſes ſmooth; antennæ rufous at the baſe. Inhabits Europe. Degeer. Gmelin.

Carabus *verſicolor*. Braſſy, body ovate and ſhort, braſſy black above, beneath black; thorax convex; wing-caſes ſmooth; antennæ rufous at the baſe. Inhabits Europe. Degeer. Gmelin.

Carabus *ſubſtriatus*. Shining black; ſhells ſlightly ſtriated, with four impreſſed dots. Inhabits Europe. Degeer. Gmelin.

Carabus *Penſylvanicus*. Reddiſh-brown; head duſky; wing-caſes ſtriated; body beneath, legs, and antennæ teſtaceous. Degeer. Inhabits Europe.

Carabus *halenſis*. Black; ſhells ſtriated, and ferruginous towards the thorax; antennæ and legs teſtaceous. Inhabits Saxony. Schall.

Carabus *mærens*. Black; wing-caſes ſtriated, and thorax rough and opake. Inhabits Saxony.

Carabus *Schalleri*. Black; ſmooth; wing-caſes with very minute punctured ſtriæ.

Carabus 8-*ſtriatus*. Green, punctured; wing caſes with eight ſtriæ; legs pale. Inhabits France. Geoffr.

Carabus *nitidus*. Shining-green; wing-caſes with eight ſtriæ and three impreſſed dots; legs pale. Inhabits France. Geoffr.

Carabus *viridis*. Green; wing-caſes with eight ſtriæ, anterior part and margin fulvous. Inhabits France. Geoffr.

Carabus *nobilis*. Black; thorax deep black; wing-caſes red, with a black croſs. Inhabits France. Geoffr.

Carabus *ærugineus*. Shining; head and ſhells green; thorax coppery, with twelve dots. Inhabits France. Geoffr.

Carabus *ſtrigoſus*. Black, thorax ferruginous; wing-caſes ſtriated, with four livid ſpots. Inhabits France. Geoffr.

Carabus *nigricollis*. Entirely black; wing-caſes ſtriated, with four livid ſpots. Inhabits France. Geoffr.

Carabus 8-*maculatus*. Black, ſhells ſtriated, with eight livid ſpots. Inhabits France. Geoffr.

Carabus *minutulus*. Entirely black and ſmooth. Inhabits France. Geoffr.

Carabus *tenebrioides*. Black, thorax broad; wing-caſes ſtriated, with punctures. Inhabits France. Geoffr.

Carabus *laticollis*. Entirely green; thorax broad. Inhabits France. Geoffr.

Carabus *fuſcipes*. Black, ſmooth; legs and baſe of the antennæ ferruginous. Inhabits France. Geoffr.

Carabus *ſpinipes*. Piceous; thorax with an excavated longitudinal line; ends of the legs ſpinous. Inhabits Europe. Scopoli.

Carabus *elegans*. Thorax linear, and as long as the ſhells; legs rufous. Inhabits Europe. Scopoli.

Carabus *cordatus*. Thorax inverſely heart-ſhaped. Inhabits Europe. Scopoli.

Carabus *junceus*. Body ſomewhat linear; thorax narrowed behind. Inhabits Carniola and Helvetia. Scopoli.

Carabus *Scopoli*. Braſſy-green; wing-caſes teſtaceous, with the whole margin and band fuſcous. Inhabits Carniola. Scopoli.

Carabus *ſalicinus*. Black dotted; wing-caſes fuſcous, ſtriated; antennæ and legs ferruginous. Inhabits Carniola. Scopoli. Found on willows, &c.

Carabus *arenoſus*. Braſſy-fuſcous; thorax ſomewhat roundiſh, and dentated behind; legs rufous. Inhabits ſandy places in Carniola. Scopoli.

Carabus *lucidus*. Gloſſy-black; wing-caſes and legs teſtaceous. A ſmall ſpecies, and inhabits Hungary. Scopoli.

Carabus *atomarius*. Apterous, black, glabrous; wing-caſes edged with violaceous, ſmooth, and ſprinkled with minute, confluent, violaceous dots. Muſ. Leſk. Gmel.

Carabus *miliarius*. Apterous, black; wing caſes with elevated ſcattered dots; outer margins braſſy-violet. Inhabits Europe. Leſk. Gmel.

Carabus *fractus*. Apterous, black; wing-caſes ridged, the alternate ridges broken irregularly. Inhabits Europe. Leſk. Gmel.

Carabus *cypris*. Apterous, black, and coppery; wing-caſes with four ridges each, containing three rows of elevated dots. Inhabits Europe. Leſk. Gmel.

Carabus 5-*lineatus*. Black; thorax rounded, laterally truncated behind with an impreſſed dorſal line, and a double one on each ſide at the baſe; wing-caſes ridged, the five innermoſt joining the ſixth at the tip. Inhabits Europe. Leſk. Gmel.

Carabus *tricolor*. Ferruginous black; head, antennæ at the baſe, and thorax black; wing-caſes depreſſed, ſtriated, tip truncated, and with the outer edge of the thorax ferruginous. Inhabits Europe. Leſk. Gmel. Obſ. Antennæ cinereous and glabrous.

Carabus *confluens*. Black; thorax rounded at the ſides; wing-caſes ſtriated, the firſt and eighth, ſecond and ſeventh, united at the tip. Inhabits Europe. Leſk. Gmel.

Carabus *Leſkii*. Deep black; head and thorax black; wing-caſes brown, with ſilky ſtriæ; antennæ and legs ferruginous. Inhabits Europe. Leſk. Gmel.

Carabus *trichrous*. Black; antennæ and legs ferruginous; wing-caſes finely ſtriated; head and thorax braſſy, the latter with an impreſſed dorſal line, and two ſmaller on each ſide behind. Leſk. Gmelin makes three varieties of this ſpecies; namely, β Carabus antennis baſi rubris. Leſk. γ Carabus ater. Leſk. δ Carabus niger. Leſk. All theſe inhabit Europe.

Carabus *pullus.* Ferruginous black; wing-caſes ſtriated; antennæ rufous. Inhabits Europe. Leſk. Gmel.

Carabus *quadratus.* Thorax nearly ſquare, with an impreſſed dorſal line, and a ſmaller one on each ſide behind; wing-caſes ſtriated. Leſk. Gmel.

Carabus *plicatus.* Black; thorax ſomewhat orbicular, and plaited on each ſide behind. Inhabits Europe. Leſk. Gmel.

Carabus *picatus.* Piceous; wing-caſes black and ſtriated; thorax with an impreſſed dorſal line, and two ſmaller on each ſide behind, the inner one moſt elevated. Inhabits Europe. Leſk. Gmel.

Carabus *emarginatus.* Black; thorax nearly ſquare, and truncated behind; wing-caſes ſtriated and emarginated at the tip. Inhabits Europe. Leſk. Gmel.

Carabus *chalybeus.* Black; head and thorax braſſy; ſhells braſſy-black, and ſtriated, with greeniſh outer margin. Inhabits Europe. Leſk. Gmel.

Carabus *erythroceras.* Black; thorax nearly ſquare, and rounded at the ſides; wing-caſes ſtriated; antennæ rufous; legs ferruginous. Inhabits Europe. Leſk. Gmel.

Carabus *concolor.* Black; thorax nearly ſquare; ſhells deep black, and very finely ſtriated. Inhabits Europe. Leſk. Gmel.

Carabus *erythropus.* Black; thorax ſquare behind; wing-caſes ſtriated; antennæ and legs rufous. Inhabits Europe. Leſk. Gmelin ſpeaks of a variety of this ſpecies with ſtriæ of dots on the wing-caſes.

Carabus *crenatus.* Black; wing-caſes with crenated punctured ſtriæ. Inhabits Europe. Leſk. Gmel.

Carabus *diſtinctus.* Above black, beneath ferruginous; thorax truncated behind. Inhabits Europe. Leſk. Gmel.

Carabus *rubicornis.* Black, antennæ red; poſterior part of the thorax truncated, with an impreſſed dorſal line. Inhabits Europe. Leſk. Gmel.

Carabus *punctulus.* Black, with a row of minute dots on the ſhells. Inhabits Europe. Leſk. Gmel.

Carabus *biſpinoſus.* Black; thorax truncated behind; anterior ſhanks thick, and two-ſpined. Inhabits Europe. Leſk. Gmel.

Carabus *erythromelas.* Black, antennæ and ſhanks ferruginous. Inhabits Europe. Leſk.

Carabus *viridans.* Greeniſh-black; antennæ and legs rufous: wing-caſes ſtriated with flat finely punctured ridges. Inhabits Europe. Leſk.

Carabus *multicolor.* Black, head and thorax green; wing caſes bluiſh-green, with yellow down; mouth, baſe of the antennæ, and the legs rufous. Inhabits Europe. Leſk.

Carabus *obfuſcatus.* Fuſcous, thorax truncated behind; wing-caſes ſtriated; antennæ and legs ferruginous. Inhabits Europe. Leſk.

Carabus *dolens.* Black; wing-caſes ſtriated; ſhanks ferruginous. Inhabits Europe. Leſk.

Carabus *exciſus.* Ferruginous-glabrous; thorax truncated before and jagged behind; wing-caſes ſtriated. Inhabits Europe. Leſk.

Carabus *limbatus.* Black; thorax margined, plaited behind; wing-caſes ſtriated; legs black-ferruginous. Inhabits Europe. Leſk.

Carabus *trunculatus.* Black; thorax truncated behind; wing-caſes ſtriated; legs ferruginous-brown. Inhabits Europe. Leſk.

Carabus *chloromelas.* Black, above green; antennæ and legs ferruginous. Inhabits Europe. Leſk.

Carabus *ſinuatus.* Black; wing-caſes ſtriated, and ſinuate at the apex; antennæ rufous at the baſe. Inhabits Europe. Leſk.

Carabus *pallidicornis.* Black; wing-caſes ſtriated; thorax truncated behind, outer margin, with the legs and antennæ, pale. Inhabits Europe. Leſk.

Carabus *aurichalceus.* Braſſy-black; antennæ and legs rufous. Inhabits Europe. Leſk.

Carabus *rotundatus.* Black, above braſſy; thorax rounded; wing caſes ſtriated; ſhanks ferruginous. Inhabits Europe. Leſk.

Carabus *lituratus.* Piceous; head, legs, and ſtriated wing-caſes teſtaceous, the laſt with a common black violet ſpot at the tip; thorax violet. Inhabits Europe. Leſk.

Carabus *cylindricus.* Teſtaceous, cylindrical; head black; thorax orbicular and rufous. Inhabits Europe. Leſk.

Carabus 4-*notatus.* Black, thorax orbicular; wing-caſes blue-brown, with four teſtaceous dots; legs teſtaceous. Inhabits Europe. Leſk.

Carabus 6-*notatus.* Braſſy-black; thorax rounded; wing-caſes ſtriated, with three pair of impreſſed dots at the future. Inhabits Europe. Leſk.

Carabus *fucicornis.* Black, above braſſy; thorax rounded and punctured; wing-caſes with crenated ſtriæ; antennæ brown; legs rufous. Inhabits Europe. Leſk.

Carabus *triſpinoſus.* Black; head and orbicular thorax braſſy; wing-caſes ferruginous, braſſy, and ſtriated with punctures; legs rufous; thighs thick; ſhanks ſpinous. Inhabits Europe. Leſk.

Carabus *mæſtus.* Ferruginous; thorax rounded; wing-caſes ſtriated; head brown; antennæ and legs teſtaceous. Inhabits Europe. Leſk.

Carabus *porphyropus.* Piceous, thorax truncated; wing-caſes ſtriated; antennæ and ſhanks rufous. Inhabits Europe. Leſk.

Carabus *atratus.* Black; thorax orbicular; wing-caſes pale, varied with black; antennæ and legs ferruginous fuſcous. Inhabits Europe. Leſk.

Carabus *lepidus.* Above braſſy-green, beneath bluiſh; thorax nearly ſquare, with four impreſſed ſtriæ behind; anterior ſhanks dilated at the tip. Inhabits Luſace. Leſk.

CARAC, Karek, or Charedsi, in *Geography.* See Karek.

CARACA, in *Botany*, Rumph. Amb. 5. p. 373. tab. 132. See Dolichos *bulboſus.*

CARACAL, in *Zoology*, an animal of the lynx tribe, by ſome called the Perſian lynx. See Felis *caracal.*

CARACALLA, in *Antiquity*, a long garment, having a ſort of capuchin or hood a-top, and reaching to the heels; worn equally among the Romans by the men and the women, in the city and the camp.

Spartian and Xiphilin repreſent the emperor Caracalla as the inventor of this garment, and hence ſuppoſe the appellation *caracalla* was firſt given him. Others, with more probability, make the caracalla originally a Gallic habit, and only brought to Rome by the emperor above-mentioned, who firſt enjoined the ſoldiery to wear it. The people called it *Antoninian*, from the ſame prince, who had borrowed the name of Antoninus.

The caracalla was a ſort of caſſock, or ſurtout. Salmaſius, Scaliger, and after them Du-Cange, even take the name *caſaque* to have been formed from that of *caraque*, for *caracalla.* This is certain from St. Jerom, (epiſt. 128, ad Fabiolam,) that the caracalla which became an eccleſiaſtical garment, was a kind of cloak with a cowl; for both he, and Eucherius, (Inſtruction. l. ii. c. 10.), deſcribing the ephod, or ſacerdotal garment of the Jewiſh prieſts, tell us, it was made "in modum caracallæ," after the manner of the caracalla, or monkiſh dreſs, "ſed ſine cuculla," but without a cowl. The garment of Amphibalus, a monk of Caerleon, which St. Alban put on when he ſuffered death, is called by Bede, and other ancient writers, caracalla, which is rendered by the Saxon interpreter of Bede, a monkiſh habit. Thomas Walſingham, (apud Uſſer Britan. Eccleſ. antiq. p. 78.), relates, that this garment was preſerved in the church of Ely, in a large cheſt, which was opened in the reign of Edward II. A. D. 1314. The caracalla is deſcribed as made of ſeveral pieces cut and ſewed together, and hanging down to the feet; but it is more than probable there were ſome made ſhorter, eſpecially out of Rome, otherwiſe we do not ſee how it could have fitted the purpoſes of the ſoldiers.

Caracalla, in *Biography* and *Hiſtory*, a Roman emperor, was the ſon of the emperor Severus and Julia Domna, and born A. D. 188. At the age of eight years, his family name "Baſſianus," which he derived from his maternal grandfather, was changed by Severus, on his becoming emperor, into the highly reſpected names of Marcus Aurelius Antoninus; conferring upon him at the ſame time the dignity of Cæſar, which title was confirmed to him in the following year, viz. A.D. 197, by a decree of the ſenate. By theſe names he choſe to be diſtinguiſhed; but his infamous conduct has cauſed his hiſtory to be tranſmitted to poſterity under the nick-name of Caracalla, which was occaſioned by his fondneſs for a Gauliſh robe ſo called, (ſee the preceding article) worn by himſelf in preference to any other, and gratuitouſly diſtributed among his ſoldiers and the inhabitants of Rome, for their uſe. In his eleventh year, the emperor induced the ſoldiers, after the capture of Cteſiphon, to proclaim him "Auguſtus;" Geta his brother, receiving at the ſame time the title of Cæſar, and the name of Antoninus. The act of the ſoldiers was confirmed by the ſenate, and Severus recompenſed them with liberal donations. Before he had completed his 14th year, the emperor, whilſt he was at Antioch, proſecuting a war againſt the Jews, in which this youth had the title of commander, and for the ſucceſsful iſſue of which the ſenate decreed him a triumph, gave him the manly robe, and made him his colleague in the conſulſhip, A. D. 202. In the following year he married the daughter of Plautianus, the pretorian prefect, and an inſolent favourite, whoſe abuſe of the infamous power with which he was entruſted, brought him to an untimely end. Caracalla was inſtrumental in procuring the prefect's death, A. D. 205; and his hatred of the father was ſoon followed by an invincible diſlike of the daughter, whom he had married againſt his inclination. To the ruin of Plautianus ſucceeded that of his family; for his ſon Plautus, and daughter Plautilla, were baniſhed to the iſland of Lipari, where they languiſhed in miſery and perpetual alarms, till Caracalla, after he became emperor, ordered them to be killed. Caracalla and his brother Geta, who was declared "Auguſtus," and inveſted with the tribunitian power, A. D. 208, had conceived from their infancy an implacable hatred againſt one another. With a view of diverting their minds and allaying the animoſity that ſubſiſted between them, Severus took them with him in his expedition to Britain. But the ambition of Caracalla led him to avail himſelf of every opportunity that occurred for ingratiating himſelf with the officers and ſoldiers, and for inducing them to acknowledge him ſole emperor in prejudice to his brother, whom he regarded as an odious rival. In order to haſten his attainment of the ſovereign power, he even attempted to murder his father, whilſt he was concluding a treaty with the Britons, and receiving their arms. He afterwards intrigued with the officers and ſoldiers for the purpoſe of depoſing him. Some have ſaid, that during his laſt illneſs, Caracalla endeavoured to bribe the phyſician, who attended him, in order to haſten his death. Severus, who died at York, A. D. 211, was ſucceeded by his two ſons, whom he had inveſted with the ſovereign power during his life-time, and by his laſt will appointed to reign jointly after his death. The early antipathy that ſubſiſted between the two brothers was invincible; and the intreaties, rebukes, and exhortations, both of their father and their preceptor Antipater, had been altogether ineffectual to their reconciliation. As ſoon as Severus had expired, Caracalla endeavoured to exclude his brother, by his influence with the army, from any ſhare in the ſovereignty: but the ſoldiers proteſting that they would equally obey both the ſons of Severus, as he had appointed both to ſucceed him, he was forced to acknowledge his brother partner in the empire, and to ſuffer the ſoldiers to take the uſual oath of allegiance to each. After this ceremony, Caracalla concluded a ſhameful treaty with the Britons; and both the brothers, about the middle of ſummer, ſet out for Rome with their mother Julia, and the aſhes of their deceaſed father. In the progreſs of their journey, Caracalla attempted to murder Geta; and this attempt increaſed their mutual animoſity and jealouſy to ſuch a degree, that they afterwards marched with their ſeparate guards, and with no leſs warineſs than if they had been in an enemy's country; lodging conſtantly in different houſes, and carefully watching the motions of each other. On their arrival at Rome, they were received with great ſolemnity: but the diſcord that prevailed, and that was every day increaſing between the two princes, produced two contending factions; and it was therefore propoſed to make a diviſion of the empire between them. Geta, who loved a quiet life, conſented, that if Caracalla would ſurrender Aſia and Egypt, he would retire to Alexandria, or Antioch, and leave him in unmoleſted poſſeſſion of the reſt of the empire. But this ſcheme was defeated by their mother Julia. Towards the cloſe of this year, Caracalla made another attempt to murder his brother during the feaſt of Saturn; and this outrage occaſioned almoſt an open war between the two princes, and a great deal of bloodſhed. In the following year, A. D. 212, he effected his purpoſe, on occaſion of an interview which was propoſed, with a view to their reconciliation; when ſome centurions whom he had placed in ambuſh ruſhing on Geta with their ſwords in their hands, and urged on by the monſter Caracalla himſelf, diſpatched him with many wounds, whilſt he was ſeeking refuge in the arms of his mother, who in endeavouring to ſave him was herſelf alſo wounded. Having by this atrocious act made himſelf ſole maſter of the empire, he conciliated the attachment of the army by the moſt extravagant donations, and by circulating reports, as well as by public declarations, that his brother was a traitor, and that he had ſlain him unwillingly in his own defence, he eſtabliſhed his own power. In order to delude the ſoldiers and the people, and to gain credit to theſe unfounded pretences, he repaired to the camp of the prætorian cohorts, and proſtrating himſelf upon the ground before the images of the tutelary deities, he offered up ſacrifices of thankſgiving for his happy eſcape: juſtifying himſelf alſo by ſimilar declarations to the ſenate, before which he appeared, ſurrounded with his guards, and armed with a cuiraſs, he obtained the approbation of that baſe and venal aſſembly. By artifices of this nature he ſucceeded in prevailing with the prætorians to declare him ſole emperor, and Geta a public enemy. That Caracalla himſelf was active as one of the executioners in the

the aſſaſſination of his brother is not improbable, if we conſider, that ſome years after this event, he conſecrated in the temple of Serapis, at Alexandria, the ſword which he had uſed in the murder of Geta. When the ſavage deed was perpetrated, he forbade his mother, by menaces againſt her life, even exhibiting any ſigns of ſorrow on the occaſion: and he actually put to death Fadilla, the only remaining daughter of Marcus Aurelius, for diſobeying a ſimilar injunction.

In order to conciliate the ſenate, he made an oſtentation of clemency, by allowing all exiles to return to the city; and as he made no diſtinction between the innocent and the guilty, he thus filled Rome with multitudes of villains who had richly deſerved the puniſhment inflicted on them. With a view of ſatisfying the public, Caracalla permitted the memory of his brother to be honoured, uſing at the ſame time this memorable expreſſion, "Sit divus, dum not ſit vivus," i. e. "Let him be a god, as long as he is not alive;" and accordingly the ſenate iſſued a decree, by which he was enrolled among the gods. Notwithſtanding theſe apparent but undiſtinguiſhing tokens of clemency, and this ſeeming reſpect for his deceaſed brother, Caracalla was rigorous and cruel in his conduct towards all thoſe who manifeſted any reſpect for Geta, or who had any connection with him whilſt he lived; and he adopted every method which he could deviſe for eraſing the remembrance of him from the minds of ſurvivors. Dion Caſſius informs us, that in the general maſſacres of his partiſans and friends, he ordered all his domeſtics, to the number of 20,000 perſons, to be inhumanly put to death; it was death even to mention his name; and no one was allowed to uſe it even on the ſtage, where it was familiarly applied to ſlaves. All the money that bore his name was ordered to be melted down; and the inſcriptions were eraſed. The dead bodies of thoſe who were maſſacred were treated with indignity, burnt without ceremony, or were expoſed to the beaſts and birds of prey. Not ſatisfied with the murder of perſons of inferior rank, Caracalla ſacrificed to his rage and jealouſy a great number of illuſtrious victims, among whom, Papinianus, the prætorian præfect, and the moſt eminent civilian in the opinion of Zoſimus and Cujas, that ever lived, was the moſt diſtinguiſhed. Papinianus had returned the confidence of Severus by faithful and zealous endeavours to promote union and concord between the two brothers; and having thus diſguſted Caracalla, he was deprived of the poſt of prætorian prefect. But the immediate cauſe of his death was his laudable refuſal to concur in furniſhing Caracalla with apologies for the murder of his brother. "It is eaſier," he nobly replied, "to commit a parricide, than to juſtify it; and to accuſe an innocent perſon is a ſecond parricide." In ſhort, no ſex, rank, or age, eſcaped the cruelty of this monſter of wickedneſs: and he ſeems to have equalled, or even exceeded Caligula in the indulgence of the moſt malignant paſſions. Indeed, in another reſpect he alſo reſembled him, as a portion of real inſanity ſeems to have blended itſelf with a temper and character radically and habitually vicious. His acts of rapine and extortion correſponded to thoſe of his cruelty; and he ſeems to have made it his ſtudy through his whole reign to haraſs and oppreſs his people. Fond of public ſpectacles, he ſquandered with profuſion in the ſupport of theſe, what he extorted from the people; and his prodigality to the ſoldiers, with a view of engaging their affections, was unbounded. In games and ſhows he himſelf took an active part, fighting on occaſions of this kind with wild beaſts, and driving chariots in the circus. Whilſt he indulged a taſte altogether unſuitable to his high rank and office, and the meaneſt kind of curioſity and inquiſitiveneſs, he deſpiſed every quality that was likely to command eſteem; and his ignorance, and his contempt of literature and of learned men, were notorious. His debaucheries were as deteſtable as his other bad qualities; and yet, with an unpardonable hypocriſy, he affected zeal for chaſtity and even for religion, though he forbade any one's calling him by the names of the divinities he worſhipped: but his pretended piety was blended with a paſſion for the deluſive arts of magic and judicial aſtrology.

Having eſtabliſhed in the capital of his empire a character deteſtable for cruelty and oppreſſion, and levelled the prerogatives of the Roman people by extending them to all the ſubjects of his empire, he determined to trace the footſteps of Alexander the Great, for whom he profeſſed an extravagant veneration, in the path of military glory. Ambitious of reſembling this conqueror in every circumſtance of his hiſtory, he condeſcended to aſſociate upon the moſt intimate terms with his ſoldiers, and to take part with them in all their military labours and exerciſes; and having thus fitted himſelf, as he conceived, for all the offices of a great commander, he left Italy, A. D. 213, and commenced his expeditions by viſiting Gaul, where he exerciſed ſuch cruelties that he was more hated and abhorred there than he had ever been at Rome. He afterwards croſſed the Rhine, and conducted an expedition againſt the Catti and the Alemanni, now firſt mentioned in hiſtory; but he was obliged to purchaſe a peace with large ſums, and the liberty of returning with ſafety into the Roman dominions. As ſoon as it was known in Germany that he had bought a peace of theſe people, all the nations inhabiting that extenſive country flew to arms, and compelled him to grant them yearly penſions, the ſupply of which reduced him to the neceſſity of coining falſe money. In an interview with the Barbarians on this occaſion, he was guilty of an act of perfidy, which of itſelf is ſufficient to fix an indelible ſtain on his memory. Having ordered all the youth of Noricum to take arms, and join him, he commanded his troops to fall upon them and to put them all to the ſword. For this pretended victory he aſſumed the title of "Alemannicus." From the borders of the Rhine he marched to the Lower Danube, and obtained ſome ſlight advantages over the Barbarians, then hardly known, but afterwards too intimately connected with the affairs of declining Rome, called by the Romans Geti, and in ſubſequent times Goths. Having made an alliance with the Dacians, he paſſed from the banks of the Danube into Thrace; and afterwards croſſing the Helleſpont, he arrived at Ilium, and paid ſingular honours to the memory of Achilles at his ſuppoſed tomb. The death of Feſtus, his favourite freedman, whom he is ſuppoſed to have poiſoned, for the purpoſe which he propoſed, furniſhed him with an opportunity of reſembling Achilles in his funeral of Patroclus. Accordingly, he ſpared no expence in rendering the obſequies of Feſtus extremely pompous. From Ilium he went to Pergamus, to ſeek relief in the temple of Æſculapius, under the diſorders of mind and body, of which he had reaſon to complain, and which were probably owing to the agitations of remorſe and terror. Having ſpent the winter at Nicomedia, he prepared for attacking the Parthians and Armenians; but Artabanus was under a neceſſity, on account of the inteſtine diviſions of Parthia, to avert the attack by a timely ſubmiſſion. By the baſeſt perfidy, he made captives of Abgarus, king of Edeſſa, and the king of Armenia; but the only fruit which Caracalla reaped from his perfidy was the defeat of Theocritus, one of his generals, the conſequent ſhame he ſo juſtly merited, and the univerſal diſtruſt of all mankind. However, he poſſeſſed a ſoul incapable of feeling ſuch humiliations; and therefore gloried in the ſucceſs of his exploits, and wrote haughty and boaſtful letters to the ſenate on the occaſion, as Caligula had done before him. At Alexandria, whither he next went, he perfidiouſly availed himſelf of an opportunity that offered itſelf of avenging himſelf of the Alexandrians for ſome railleries which theſe volatile and ſarcaſtic people had formerly thrown out againſt him. The meaſure he adopted for this purpoſe was the moſt horrible maſſacre which hiſtory records. Having declared his intention of rendering perſonal homage to the god Serapis, the Alexandrians received him with every poſſible token of reſpect. Upon his firſt entrance into the ſacred temple, he ſacrificed whole hecatombs, and burnt upon the altar a great quantity of incenſe. From thence he proceeded to the tomb of Alexander, and rendered peculiar honours to the deceaſed hero. All theſe ſpecious and pompous appearances ſerved, however, to conceal his black deſign of extirpating the inhabitants of Alexandria. In the midſt of the feſtivities produced by the deluſion he was practiſing, he directed, from his poſt in the temple of Serapis, his troops to fall on the aſſembled inhabitants and to make an undiſtinguiſhed ſlaughter. Many thouſands of natives and ſtrangers fell in the carnage, and an univerſal pillage ſucceeded, which, with the ſeverities that followed this horrid maſſacre, reduced their flouriſhing capital almoſt to a ſtate of deſolation. This deſolation, however, was but a temporary evil; for Caracalla not long ſurviving, Alexandria recovered its ſplendour by its own reſources, and ſoon became again the ſecond city of the empire. Caracalla having completed his purpoſes of vengeance at Alexandria, determined to proceed towards Parthia; and making Artabanus's refuſal to give him his daughter in marriage a pretext for violating the peace which had been concluded between the empires, he ravaged a large tract of country, plundered the cities, and after overrunning all Media, drew near the royal capital, where, like a daſtardly enemy, he vented his fury even upon the dead, opening the tombs of the Arſacidæ, and ſcattering their aſhes to the wind. Upon his return to Meſopotamia he boaſted that he had conquered the Parthians, whom he had not even ſeen, and in his letters to the ſenate and Roman people, he pretended that he had ſubdued all the Eaſt, and obliged every country beyond the Euphrates to acknowledge their laws. In conſequence of theſe pretences, he obtained from the ſenate the appellation of "Parthicus," and a decree for a triumph. The war would have been furiouſly renewed if a domeſtic conſpiracy had not put an end to the miſeries inflicted on the world by this deteſtable tyrant. M. Opilius Macrinus had riſen from a low ſtation to the poſt of prætorian prefect; but he had incurred the jealouſy and hatred of Caracalla, whoſe ſuſpicion was increaſed by the prediction of a diviner, that he was to ſucceed him on the throne. The circumſtances of Macrinus were become critical, in conſequence of ſome diſpatches from Rome, which accidentally fell into his hands; and in order to evade the ſtroke which was meditated againſt him, he employed a diſcontented centurion, named Martialis, to aſſaſſinate the empe- . Accordingly, whilſt he was purſuing his journey from ſſa, where he had wintered, to Carrhæ, for the purpoſe fering a ſacrifice in the temple of the Moon, a call of nature obliged him to alight: Martialis ſeized the opportu- when he was almoſt alone, to diſpatch him with a The aſſaſſin inſtantly fled; but he was purſued, en, and ſlain by ſome of the emperor's attendants. ſhed Caracalla on the 8th of April, A.D. 217, at 29 years, and after a reign of ſix years, two ſix days. His death was regretted by the ſol emanded that he ſhould be ranked among the ceſſor Macrinus treated as a god, a prince whom he had been inſtrumental in killing; and the ſenate, by his orders, decreed him divine honours. Thus, this monſter, deteſted by heaven and earth, had his temple, his prieſts, and feſtivals, eſtabliſhed for the worſhip of him at Rome. The authors who lived under Caracalla were Q. Severus Sammonicus, murdered by his order; Ælius Maurus, and Oppian. The principal hiſtorians of this period are Herodian, Dion Caſſius, and Spartian. Crevier's Hiſt. of the Emperors, vol. viii. Anc. Un. Hiſt. vol. xiii.

Caracalla, in *Botany*. See Phaseolus *Caracalla*.

CARACARA, in *Ornithology*, the name under which Buffon deſcribes the Braſilian kite. See Falco *Braſilienſis*. The ſame name caracara has been alſo given to the goldbreaſted trumpeter, Psophia *Crepitans*, which ſee.

CARACARAS, in *Zoology*, a ſpecies of ſnake. See Coluber.

CARRACCA, La, in *Geography*, a ſea-port town of Spain, in the province of Andaluſia; two leagues E. of Cadiz.

CARACCAS, a diſtrict of Terra Firma in South America, belonging to the Spaniards. It lies between the province of Venezuela to the weſt, and that of Cumana to the eaſt, and is bounded on the north by the Caribbean ſea, and on the ſouth, by parts of America little known. The coaſt is rocky and mountainous, but its vallies and plains are fertile, and produce the cacao-tree, indigo, ſugar, and tobacco. The air is reckoned clear, and the climate wholeſome. Its principal towns are Caraccas, the capital, and Porto Cavallo, which is a ſea-port town. In conſequence of the acknowledged ſuperiority of the cacao nuts in this province, and its communication with the Atlantic which facilitates the conveyance to Europe, the culture of the cacao there is more extenſive than in any diſtrict of America. However, the Dutch, by the vicinity of their ſettlements in the ſmall iſlands of Curaçoa and Buen-Ayre, to the coaſt of Caraccas, gradually ingroſſed the greateſt part of the cacao-trade. Hence the traffic with the mother country ceaſed almoſt entirely; and ſuch was the ſupine negligence of the Spaniards, or ſuch were the defects of their commercial arrangements, that they were obliged to receive from the hands of foreigners this production of their own colonies, at an exorbitant price. In order to remedy an evil no leſs diſgraceful, than pernicious to his ſubjects, Philip V. in 1728, granted to a body of merchants an excluſive right to the commerce with Caraccas and Cumana, on condition of their employing at their own expence, a ſufficient number of armed veſſels to clear the coaſt of interlopers. This ſociety, ſometimes diſtinguiſhed by the name of the company of Guipuſcoa, from the province of Spain in which it was eſtabliſhed, and ſometimes by that of the company of Caraccas, from the diſtrict of America to which it trades, has carried on its operations with ſuch vigour and ſucceſs, that Spain has recovered an important branch of commerce, which ſhe had ſuffered to be wreſted from her, and is plentifully ſupplied with an article of extenſive conſumption at a moderate price. From this inſtitution the colony, as well as the parent ſtate, has derived great advantage. The planters in the Caraccas are not left to depend entirely on the company either for the importation of European commodities, or the ſale of their own productions. The inhabitants of the Canary iſlands have the privilege of ſending thither annually a regiſter ſhip of conſiderable burden; and from Vera Cruz in New Spain, a free trade is permitted to every port comprehended in the charter of the company. Hence ariſes a competition which tends to fix the price of all commodities, both purchaſed and ſold, at its natural and equitable rate. The company has not the power of raiſing the former or degrading the latter at pleaſure; and accordingly, ſince it was eſtabliſhed, the increaſe of culture, of population, and of live ſtock, in the province of Caraccas, has been very conſiderable. During twenty years, prior to the eſtabliſhment of this company, only five ſhips ſailed from Spain to that province; and during 16 years, from 1706 to 1722, not a ſingle ſhip arrived from Caraccas in Spain. Before the erection of the company, neither tobacco nor hides were imported from Caraccas into Spain. But ſince the commercial operations of the company began, in the year 1731, the importation of cacao into Spain has very much increaſed. The company at firſt employed twelve veſſels to carry on its trade, with nineteen to guard the coaſt from ſmugglers, varying theſe numbers as ſuited their convenience, and for both theſe purpoſes they engaged 2500 ſeamen. The ports they uſed in Spain were St. Sebaſtian and Cadiz. During thirty years ſubſequent to 1701, the number of "fanegas" (each 110 pounds) imported from Caraccas was 643,215. During eighteen years ſubſequent to 1731 the number of fanegas imported was 869,214. And if we ſuppoſe the importation to be continued in the ſame proportion during the remainder of 30 years, it will amount to 1,448.746 fanegas, which is an increaſe of 805,531 fanegas. During eight years ſubſequent to 1756, there have been imported into Spain by the company 88,482 "arrobas" (each 25 pounds) of tobacco and hides to the number of 177,354. During five years ſubſequent to 1769, it has imported 179,156 fanegas of cacao into Spain, 36,208 arrobas of tobacco, 75,496 hides, and 221,432 peſos in ſpecie. In return for the cacao with which it ſupplies Mexico, it receives caſh, which is either remitted to Spain or laid out in purchaſing European goods. The quantity of cacao raiſed in the province is double of that which it yielded in 1731; the number of its live ſtock is more than treble, and its inhahitants much augmented. The revenue of the biſhop, which ariſes wholly from tythes, has increaſed from 8000 to 20,000 peſos; the price of cacao has decreaſed from 80 peſos for the fanega to 40. Guiana, including all the extenſive provinces ſituate on the banks of the Orinoco, the iſlands of Trinidad and Marguerita, are added to the countries with which the company of Caraccas had liberty of trade by their former charters; and in 1752 their grant was extended to the province of Maxacaybo. However, in many of the operations of this company, the illiberal and oppreſſive ſpirit of monopoly has been conſpicuous, and has prevented the company from deriving all the beneficial effects, which their conſtitution was adapted to afford them. In 1780 this company received a very ſevere ſtroke in the capture of a rich convoy by Lord Rodney, valued at more than 20,000l. and a few years after their capital was abſorbed in a new eſtabliſhment, called the *Company of the Philippines*; which ſee. Robertſon's America, vol. iii. Townſend's Journey through Spain, vol. ii.

CARACCAS, or LEON DE CARACCAS, the capital of the diſtrict above deſcribed, ſituated in a plain ſome leagues from the ſea, from which it is ſeparated by mountains, and rendered difficult of acceſs: and containing about 24,000 inhabitants. It is the reſidence of a governor, and carries on a conſiderable trade. Its port, named "Guayra," though it has bad anchorage, is improved by the conſtruction of a mole. N. lat. 10° 30′. W. long. 66° 26′.

CARACCAS, *Silla de*, a mountain on the coaſt of South America, in the province of Venezuela, 1316 toiſes in height. There is a dreadful perpendicular precipice of 1300 toiſes in this mountain, above Caravalledo; the northern part of this chain being perhaps broken by the gulf of Mexico.

CARACCI, LUDOVICO, in *Biography*, an eminent painter of hiſtory, landſcape, and portrait, was born at Bologna in 1555, became a diſciple of Proſpero Fontana, and acquired his diſtinguiſhed reputation by ſtudying the works of Titian, Tintoretto, and Paolo Veroneſe, at Venice, and of Parmigiano and Corregio at Parma. With leſs fire in his compoſitions than Annibal or Agoſtino, he ſurpaſſed them in grace, dignity, and ſweetneſs; and particularly in religious ſubjects he excelled them both. "Simplicity and elegance diſtinguiſhed all his deſigns; his touch was lively, his expreſſion good; the hairs of his heads are graceful; his figures are marked with a fine outline; and his compoſition is often ſublime." "He was," ſays Mr. Fuſeli, "the ſworn pupil of nature." "To a modeſt, but dignified deſign, to a ſimplicity eminently fitted for thoſe ſubjects of religious gravity which his taſte preferred, he joined that ſolemnity of hue, that ſober twilight, that air of cloiſtered meditation, which has been ſo often recommended as the proper tone of hiſtoric colour." Whenever he courted elegance, which was ſeldom the caſe, he did it with enviable ſucceſs. His maſter-piece in oil is the altar-piece of John the Baptiſt, now in the Louvre. This artiſt died in 1619. Pilkington.

CARACCI, *Agoſtino*, the elder brother of Annibal and the diſciple of Ludovico, was born at Bologna in 1558; and having firſt ſtudied his art in the ſchool of Proſpero Fontana, he afterwards became the diſciple of Paſſeroti, but he laid the foundation of his eminence under the direction of his kinſman Ludovico. He aſſiſted Annibal in the Farneſian gallery, but leſs aſſiduous than his brother, he devoted much time to engraving, which he had learned from Cornelius Cors. "He combined," ſays Mr. Fuſeli, "with ſome learning, a cultivated taſte, correctneſs, and ſometimes elegance of form, and a corregieſque colour, eſpecially in freſco." The moſt celebrated picture of this maſter is the communion of St. Jerom, now at the Louvre, which has been often compared with its rival picture of the ſame ſubject by Domenichino. "Theſe two pictures," ſays Mr. Fuſeli, "have often been compared without much diſcrimination of the principles that diſtinguiſh either, and the reſult has commonly been in favour of Domenichino; but ſurely, if Agoſtino yields to his ſcholar in repoſe, and the placid economy of the whole, he far excels him in the principal figure, the expreſſion and character of the ſaint." Agoſtino died in 1602. Pilkington.

CARACCI, *Annibal*, an eminent painter of hiſtory, portrait, and landſcape, was born at Bologna in 1560, and being a diſciple of his couſin-german, Ludovico Carracci, he imbibed from him the beſt principles of his art, as well as an ambition to arrive at perfection in the exerciſe of it. With this view he ſtudied the works of Titian, Tintoretto, and Paolo Veroneſe, at Venice, and thoſe of Corregio at Parma. At an early age he manifeſted proofs of an extenſive genius, which not only ſurpriſed the artiſts of his time, but excited a general expectation of the excellence to which he attained. The fame of the Carraccis having reached to Rome, Annibal was invited thither by the cardinal Farneſe, and employed in painting the gallery which bears his name. But though he laboured ten years at this work, the avaricious eccleſiaſtic preſented him with only 500 crowns. At Rome he had an opportunity of obſerving the antique ſtatues, the baſſo-relievos, and alſo the compoſitions of Raphael, and he was thus led to abandon his Bologneſe manner, formed after that of Corregio, and to adopt another more learned, but more dry and leſs natural, both in deſign and in colouring. There is a ſameneſs in the manner of all the Caraccis; and the only difference between them is that which reſults from their diverſity of temper and diſpoſition. Annibal had more fire, boldneſs, and ſingularity of thought than the two others;

and his deſigns were more profound, his expreſſion more lively, and his execution more firm. His genius was better adapted to poetical and profane, than to ſacred ſubjects; though, when he attempted the latter, he generally ſucceeded. His talents were admirably formed for landſcape: the forms of his trees are grand; and in repreſenting objects after nature, he gave them a character that diſtinguiſhes them ſtrongly. He is ſaid to have been deficient, however, in his knowledge of the principles of the chiaro, nor are all his local colours commendable: but upon the whole, no painter ſeems to have been more univerſal, more eaſy, more certain in every thing he did, nor more generally approved than Annibal. "Annibal," ſays Mr. Fuſeli, "though ſuperior to his couſin and brother in power of execution and academic proweſs, was inferior to them in taſte, ſenſibility, and judgment; in proof of which he adduces the maſter-work of Annibal, viz. the Farneſe gallery; "a work whoſe uniform vigour of execution nothing can equal but its imbecility and incongruity of conception; if impropriety of ornament were fixed by definition, the ſubjects of that gallery might be quoted as the moſt deciſive inſtances; the man of ſenſe may admire the ſplendour, the exuberance, the concentration of powers diſplayed by Annibal de Caracci, but the man of ſenſe muſt lament their miſapplication in the Farneſe gallery." He died in 1609. Pilkington.

The three Carraccis, of each of whom we have above given a brief account, laid the foundation of that ſchool which has been highly celebrated by the title of the academy of the Caraccis. Young men, who aſpired to be great maſters, reſorted hither for inſtruction; and they were furniſhed with well choſen models of men and women, fine caſts from the beſt figures, from antique ſtatues, and curious baſſo-relievos; as well as the moſt capital deſigns of the great maſters, the moſt inſtructive books pertaining to the art, and the leſſons of a very noted anatomiſt, who taught whatever it was neceſſary to know, concerning the knitting of the bones, and the inſertion of the muſcles.

Among the number of the excellent artiſts that were formed in this academy, were Guido, Domenichino, Albano, Lanfranc, Guercino, and many others. Pilkington.

CARACCIOLI, Robert, a famous preacher, was born in 1425 of a noble family at Lecce in the kingdom of Naples. In early life he entered into the order of Minor Obſervantines, and before his 30th year he acquired ſuch reputation for pulpit eloquence, that Pope Nicholas V. diſpenſed with his obedience to his ſuperior, and allowed him to diſpoſe of himſelf at pleaſure. Hence it has been ſaid that he was leſs famous for ſanctity of manners than for eloquence. After having been employed in ſeveral honourable commiſſions by the popes Calixtus III. and Sixtus IV. he became firſt biſhop of Aquino, and afterwards of Lecce, where he died in 1495. As a preacher he was highly admired, and regarded as a model, with reſpect to tone, geſture, and manner, to all the young orators of his time. His ſermons, which were adapted to a rude age, and which poſſeſs few graces of ſtyle, have been collected at different times; but moſt of them are contained in an edition at Venice, 3 vols. 1490, and at Lyons in 1503. Tiraboſchi.

CARACHABAN, in *Geography*, a town of Perſia, in the province of Adirbeitzan; 80 miles W. of Tauris.

CARACO, in *Zoology*, an animal of the rat kind, nearly allied to the Great or Norway rat, deſcribed by Dr. Pallas as a native of Siberia. See Mus *caraco*.

CARACOL, in *Architecture*, is ſometimes uſed for a ſtair-caſe in the form of a helix or ſpiral.

Caracol, in *Geography*, a town of South America, between Guayaquil and Quito.

Caracol, in the *Manege*, a motion which a cavalier makes half round; or a half-turn from left to right; changing hands: that his enemy may be uncertain on which ſide he intends to attack; whether in front or flank. The word comes from the Arabic *garagol*, and that from the Hebrew *carac*, *involvere:* but we have it immediately from the Spaniſh, where caracol ſignifies properly a *ſnail*, and figuratively the evolution deſcribed above.

Caracol, in *Military Language*, is the half-turn each horſeman in an army makes after his diſcharge, to paſs from the front of the ſquadron to the rear.

Caracol is alſo a ſort of half wheel, or ſemicircular movement not only by one horſeman, but by a whole troop of cavalry, by means of which they perform a ſort of winding, or ſerpentine motion, alternately on their right and on their left, in advancing towards the enemy. The object of this movement, or of the *caracol*, is to diſquiet or annoy the enemy, to throw him into diſorder or confuſion, to conceal from him your intended point of attack, to induce him to divide or break, by diſtracting his attention, and to ſeize the favourable moment of falling upon him with advantage. The light horſe are peculiarly calculated for this kind of manœuvre and attack. Velocity, indeed, is the principal excellence and very life of cavalry.

CARACOLI, in *Commerce*, a factitious metal whereof the natives of the Caribbee iſlands make a kind of ornament, in form of a half-moon, which is called by the ſame name. The metal is brought from the Terra Firma; and the common opinion is, that it is compoſed of gold, ſilver, and copper; but the mixture is ſo perfect, that a metal reſults from the whole which never ruſts nor tarniſhes, how long ſoever kept, either in the ſea or the ground. The Engliſh and French goldſmiths have made frequent attempts to imitate it. Thoſe who have ſucceeded beſt, uſe ſix parts of ſilver, three of purified copper, and one of gold. But the curious find all the imitations much inferior in beauty to the original metal of the ſavages.

M. Hauterire, procurator-general of Martinico, makes the caracoli to be a compound of gold only with a ſort of copper found in the Terra Firma of America. F. Labat takes it for a native, or ſimple metal. The Americans alſo make rings, buckles, cane-heads, and the like, of caracoli.

CARACOMBO, in *Geography*, an African iſland, ſituated about 15 miles N. of the line, at a ſhort diſtance N.W. of the iſland of St. Thomas, and a little above the mouth of the river Gabon. It produces a variety of fruits and plants peculiar to itſelf, beſides birds and animals. It is not uncommon to find a hundred neſts of birds floating on the water upon one branch of a tree, or a ſlender twig, thus guarding themſelves againſt the attacks of ſerpents and lizards. The iſland is inhabited, as it is ſaid, by an abandoned, profligate race both of men and women. The latter in particular are ſo lewd that they are ſaid to proſtitute themſelves without diſcrimination and without ſhame.

CARACORES, in *Sea Language*, denote light veſſels uſed by the natives of Borneo, and the adjacent iſlands, and alſo by the Dutch as guarda-coſtas in thoſe latitudes. They are high at each end, and chiefly navigated with paddles, in the uſe of which they ſit both within and without board, on narrow platforms of reeds, ſupported by bars rigged out acroſs the veſſel, and one at the outer end on each ſide, which ſerve as balances to prevent its being upſet. By placing three or four ranks of rowers on the platform of reeds outſide, and ſome within, they can multiply their number ſo as to proceed with great velocity. They have triple ſheets of bamboo for a maſt, ſupported by ſhrouds, on which is hoiſted an oblong ſail, bent to a ſort of bamboo yard at the head, and a boom at the foot. The ſail is hauled aft by a ſheet, the yard has a bowline to keep to windward, and a brace or vang that leads aft. The ſail rolls up or furls by a winch at the end of the boom. See *Plate of* Boats.

CARACORUM, or Holin, in *Geography*, a Tartar village, the poſition of which is marked, in the map of M. D'Anville and the Chineſe Itineraries, about 600 miles to the north-weſt of Pekin. This village was gradually ennobled by the election and reſidence of the ſons and grandſons of Zingis. It contained two ſtreets, the one of Chineſe mechanics, the other of Mahometan traders; and the places of religious worſhip, one Neſtorian church, two moſques, and twelve temples of various idols, repreſent in ſome degree the number and diviſion of inhabitants. However, a French miſſionary declares, that the town of St. Denys, near Paris, was more conſiderable than the Tartar capital, and that the whole palace of Mangou was ſcarcely equal to a tenth part of that Benedictine abbey.

CARACT, or Carat, in *Commerce*, a denomination given to an imaginary weight, which expreſſes the degree of goodneſs, fineneſs, and perfection, or imperfection of gold. The whole maſs is conceived to be divided into twenty-four equal parts, i. e. twenty-four carats; and the purity of the ſpecimen is expreſſed by the number of carats of pure gold it contains. Thus gold of eighteen carats fine means a compound of $\frac{18}{24}$ths of pure gold, and $\frac{6}{24}$ths of ſome other metal: gold of twenty-two carats fine contains $\frac{22}{24}$ths of pure gold, and $\frac{2}{24}$ths of alloy; and pure gold is called gold of twenty-four carats fine.

The word is alſo written *carract*, *carrat*, *karract*, and *karrat*. Its original is conteſted: but we chooſe to follow Kennet, who derives it from *carecta*, a term which this author obſerves anciently denoted any weight, and came not till of later days to be appropriated to that which expreſſes the fineneſs of gold, and the gravity of diamonds. Others, however, derive it from the Arabic "kirat," which weighed half of a "danek," or grain; of which ſix made up the "dirhem," or Arabic drachm; ſo that twelve "kirats" were equal to a "dirhem." See the next article.

The mint-men fix the higheſt purity and perfection of gold at twenty-four carats; and the ſeveral degrees are eſtimated from the diviſions hereof, which are called *grains*: but it is to be obſerved, that what care ſoever is taken in purifying gold, to clear it from droſs, it can never be brought to twenty-four carats; but ſtill comes ſhort, at leaſt $\frac{1}{4}$ of a carat, or a grain; this grain they call a ſixteenth; and this ſixteenth they ſubdivide into two eighths; and each of thoſe eighths into two ſixteenths: on which calculation, they ſay, gold may be purified as far as the firſt ſixteenth of the ſecond eighth, but no further. Gold of twenty-two carats, is that which has twenty-two parts of fine gold, and two of ſilver, or other metal; or that which, in refining, loſes two parts in twenty-four of its weight. The goldſmiths generally work in gold of twenty-two carats; that being the ſtandard gold of this kingdom. By the laws of France they are prohibited from working in gold below twenty-three carats. In England, the carat is divided into four grains; in Germany, into twelve parts; and in France, into thirty two. The Chineſe reckon by touches, a hundred of which correſpond to our twenty-four carats. *Carat fine*, as above, is the twenty-fourth part of the goodneſs of a piece of pure gold. *Carat price* is the twenty-fourth part of the value of an ounce or mark of gold.—They alſo ſometimes ſay, the *carat weight*, which is the twenty-fourth part of the weight of the ounce or mark. Two troy grains make a carat grain.

Caract is alſo the weight uſed in weighing diamonds, pearls, and precious ſtones; where it conſiſts of four grains. In this ſenſe, the word is by ſome ſuppoſed to be derived from κερατιον, a fruit which the Latins call *ſiliqua*, and we *carob bean*; each of which may weigh about four grains of wheat: whence the Latin *ſiliqua* has alſo been uſed for a weight of four grains. Bruce, (Appendix to his Travels in Abyſſinia, p. 66.) deduces it from the name of the bean of the Kuara-tree, which is called "Carat." From the gold country in Africa it paſſed, as he ſuppoſes, to India; and there came to be the weight of precious ſtones, eſpecially diamonds.

The carat by which jewellers eſtimate the weight of diamonds and pearls, is about $\frac{1}{150}$ of a troy ounce. Jeffreys on Diamonds.

Hence the carat is about $3\frac{1}{5}$ grains troy.

Carats are divided into halves, quarters, or grains; and farther, into eighths, ſixteenths, and thirty-two parts. Id. ibid.

CARACTACUS, in *Biography* and *Britiſh Hiſtory*, one of the moſt renowned of the Britiſh kings.

Among the proud defenders of our ancient liberty, ſcarcely any one ſeems entitled to ſuch ample notice as Caractacus, the victory over whom was acknowledged even by the conquerors of the world to have been one of the moſt important for the complete reduction of Britain that had ever been obtained.

What were the circumſtances of his early years, or whether his education at all differed from that which was uſually beſtowed upon his countrymen, we have no means to aſcertain. The earlieſt account we hear of him is in the reign of Claudius, when Aulus Plautius, the firſt Roman general who landed on the iſland after Julius Cæſar, commanded the expedition againſt Britain. The Roman commander, it appears, was unoppoſed at his landing, and having paſſed through the Britiſh ſtates upon the coaſt without reſiſtance, puſhed forward through the country in queſt of thoſe who were in arms. This was in the year 43, when, by the direction of his guide, he firſt overtook and defeated Caractacus.

The ſpirit of this illuſtrious chief, however, was not to be ſubdued at once: and though, in the progreſs of the Roman arms immediately ſubſequent to this tranſaction, we hear but little of Caractacus, we are not to ſuppoſe he was otherwiſe employed than in inſpiring his countrymen with the thoughts of vengeance.

Four years after Caractacus had loſt the greater part of his dominions Aulus Plautius was recalled. The affairs of the iſland were left in the hands of the legates or commanders of the legions; and in the interval which occurred till the appointment of Oſtorius Scapula as governor, A. D. 50, the Britons were enabled to gain ſome few advantages. Oſtorius having reſtored the tranquillity of the Roman province in the ſouth eaſt parts of Britain, marched againſt the Ceangi, who inhabited Cheſhire, and part of Lancaſhire, oppoſite to Ireland: but was ſoon recalled by the intelligence of an inſurrection among the Brigantes. It was not long, however, before he was called to encounter more determined enemies. Theſe were the Silures, (who occupied Herefordſhire, Radnor, Brecknock, Monmouth, Glamorgan, and, in general, *South Wales*), a people naturally brave and fond of liberty, but who, at that juncture, were rendered not only more confident and bold in themſelves, but more formidable to their enemies by the valour of their leader. Caractacus, who, as we have already mentioned, had loſt the greateſt part of his own dominions, willingly put himſelf at the head of this brave people, to make another effort for the deliverance of his country. He was ſkilled, we are told, in all the wiles and ſtratagems of ſavage warfare; and in point of local knowledge had greatly the advantage of the Roman general. And of this laſt, indeed, he availed himſelf by transferring the war into the country of the Ordovices, and by chuſing a place for the field of battle, which was every way favourable to his own army, and incommodious to his enemies. The ſpot he choſe, in Shropſhire, near the confluence of the Colun and Tame, is ſtill called *Caer Caradoc,* and will be deſcribed under the head of CASTLE. Its ramparts and entrenchments are yet viſible: and it exactly anſwers the deſcription given by Tacitus. It was ſituated on the ridge of a ſteep mountain. In ſome places where the ſides were acceſſible he fortified it with maſſy ſtones, heaped together in the form of a rampart. At the foot of the mountain flowed a river with fords and ſhallows of uncertain depth. And a hoſt of men guarded his entrenchments.

The Roman general, obſerving the deepneſs of the river, the ruggedneſs of the mountain, the ſtrength of the ramparts, and the loud alacrity of the enemy, was a little diſmayed at ſuch a ſucceſſion of dangers. As long, ſays Tacitus, as they fought with miſſive weapons, the Britons had the advantage. But when Oſtorius ordered his men to advance under a military ſhell, and level the pile of ſtones that ſerved as a defence to the enemy, a cloſe engagement followed. The Britons, unable to ſuſtain the ſhock, retired ſlowly towards the ridge of the mountain, and were eagerly followed by the Romans. In ſhort, the Britons, being without defenſive armour, the legions and auxiliaries made prodigious havoc; and the victory, at laſt, became deciſive. The wife and daughter of Caractacus were taken priſoners; his brother ſurrendered at diſcretion; and he himſelf fled for protection to Cartiſmandua, the queen of the Brigantes. But adverſity, ſays the Roman hiſtorian, has no friends. Cartiſmandua, who was his ſtep-mother, loaded him with irons, delivered him to the conqueror, and he, with his whole family, were carried priſoners to Rome. Even there the name of Caractacus was in high celebrity: and curioſity was eager to behold the hero who, for nine years, had made a ſtand againſt the Roman arms. The emperor too, proud of his priſoner, beſtowed the higheſt praiſe on the valour of the vanquiſhed king; he determined to render his entry into Rome as ſolemn and public as poſſible; and the people were ſummoned to behold the ſpectacle as worthy of admiration. The followers of the Britiſh chief, we are told, walked in proceſſion. The military accoutrements, the harneſs and rich collars, which he had gained in various battles, were diſplayed with pomp. The wife of Caractacus, his daughter, and his brother, followed next: he himſelf cloſed the melancholy train. The reſt of the priſoners, ſtruck with terror, deſcended to mean and abject ſupplications. Caractacus alone was ſuperior to miſfortune. With a countenance ſtill unaltered, not a ſymptom of fear appearing, no ſorrow, no condeſcenſion, he behaved with dignity even in ruin; and being placed before the tribunal delivered himſelf in the following manner:

"If, to the nobility of my birth, and the ſplendour of exalted ſtation, I had united the virtues of moderation, Rome had beheld me, not in captivity, but a royal viſitor and a friend. The alliance of a prince, deſcended from an illuſtrious line of anceſtors—a prince, whoſe ſway extended over many nations, would not have been unworthy of your choice. A reverſe of fortune is now the lot of Caractacus. The event to you is glorious, and to me humiliating. I had arms, and men, and horſes; I had wealth in abundance: can you wonder that I was unwilling to loſe them? The ambition of Rome aſpires to univerſal dominion: and muſt mankind, by conſequence, ſtretch their necks to the yoke? I ſtood at bay for years: had I acted otherwiſe, where, on your part, had been the glory of conqueſt, and where, on mine, the honour of a brave reſiſtance? I am now in your power: if you are bent on vengeance, execute your purpoſe; the bloody ſcene will ſoon be over, and the name of Caractacus will ſink into oblivion. Preſerve my life, and I ſhall be to late poſterity a monument of Roman clemency."

Claudius, it is enough to ſay, charmed with the boldneſs of his priſoner, pardoned both Caractacus and his family. The ſubſequent events of the Britiſh chieftain's life had no hiſtorian to pen them. And here we are obliged to cloſe his hiſtory.

The ſpeech of Caractacus, which is here tranſlated literally from Tacitus's Annals, was finely uſed by Mr. Maſon, in his celebrated dramatic poem. For the ſake of epiſodical incidents, however, he has departed from the ſtrict line of hiſtorical truth: and has transferred the honour of taking Caractacus priſoner, and ſending him to Rome, from Oſtorius to Aulus Didius. Tacit. Annal. l. xii. c. 35, et ſeq.

CARACTERE, *Fr.* as a dancer, *à demi-caractere,* in a ſtyle neither groteſque nor *terre à terre;* neither wholly comic nor ſerious.

CARADIVA, in *Geography,* an Aſiatic iſland, near that of Ceylon, at the weſtern point of the kingdom of Jaſnapatan: called by the Dutch *Amſterdam.*

CARAGA, in *Ancient Geography, Rugga,* a town of Africa, 2 leagues S.S.E. of Tiſdus, mentioned by Ptolemy.

CARAGACH, in *Commerce,* a cotton that comes from Smyrna, by the way of Marſeilles.

CARAGANA, in *Botany,* (from cara-caragan, the Tartar name). Lam. Encyc. Juſſ. 358. Vent. iii. p. 409. Claſs and Order, *diadelphia decandria.* Nat. ord. *Papilionaceæ,* Linn. *Leguminoſæ,* Juſſ.

Gen. Ch. *Cal.* one-leafed, bell-ſhaped-cylindrical, deeply divided on one ſide, with five ſhort teeth. *Cor.* papilionaceous; ſtandard egg-ſhaped, half erect; the ſides folded upwards; wings oblong; keel ſtraight, oblong, obtuſe. *Stam.* filaments ten, diadelphous. *Piſt.* germ ſuperior, oblong, ſmooth; ſtyle ſtraight; ſtigma ſmooth, truncate. *Peric.* legume oblong, inflated, ſmooth. *Seeds* four to ſix, egg-ſhaped, a little globular, not compreſſed.

Eſſ. Ch. *Calyx* five-toothed. *Stigma* ſmooth, truncate. *Legume* oblong, almoſt cylindrical. *Seeds* nearly ſpherical. La Marck has formed this genus for ſome plants which Linnæus referred to robinia, but which differ from its genuine ſpecies, both in the fructification and general habit. Their ſtigma is ſmooth, not downy; their legume nearly cylindrical, not compreſſed, and their ſeeds not flattened, as in robinia. Their leaves, moreover, are generally abruptly pinnated, and the petioles often elongated, terminating in a thorny point.

Sp. 1. C. *arboreſcens,* (robinia caragana, Linn. Sp. Pl. Gmel. Sib. iv. 17. n. 22. Aſpalathus arboreſcens, pinnis foliorum cretioribus, Amm. Ruth. p. 210. Duham. Arb. p. 188. n. 3.) "Leaves with about five pairs of leaflets, downy; ſtipules thorny; peduncles ſimple, faſciculated. *Stem* riſing to a tree, from ſix to ten feet high or more. *Branches* ſhort, ſtiff. *Leaves* faſciculated; leaflets elliptical, green above, veined, and paler green beneath; common petiole lengthened into a ſpinous point, ſometimes producing an odd leaf, but nevertheleſs evidently extended beyond it ; ſtipules in the ſecond year becoming a pair of ſhort, ſpreading ſpines. *Flowers* yellow, ſcentleſs. *Legumes* an inch and half long, ſmooth, rather cylindrical, pointed. A native of Siberia. It grows beſt in a light, ſandy ſoil, and is not injured by ſevere cold. Its leaves are good fodder for cattle, and are ſaid to produce a blue colouring matter. 2. C. *macrophylla*, Lam. "Leaflets in ſix pairs, roundiſh, mucronate, ſmoothiſh ; ſtipules ſpineſcent ; peduncles ſimple, ſolitary." A ſhrub, two or three feet high. *Leaves* alternate, abruptly winged. *Flowers* yellow, axillary, ſolitary ; peduncles rather long. A native of Siberia. 3. C. *ferox*, Lam. Illuſt. Pl. 607. *fig*. 1. (Robinia ferox, Pall. Roſſ. 70. tab. 44. Travels iii. app. 752. n. 125. tab. E *e*, *fig*. 2, 3. Germ. vol. iv. Pl. 25. p. 397, French Tranſlation. R. ſpinoſa, Linn. Sp. Pl. R. ſpinoſiſſima, Laxm. Nov. Com. Petrop. 15, 558. tab. 30. *fig*. 4.) "Leaflets oblong, narrow, mucronate ; ſtipules and petioles ſpineſcent." A ſhrub about five feet high. *Branches* ſlightly angular. *Leaves* alternate, abruptly winged : leaflets in four or five pairs, a little channelled, rather enlarged towards the ſummit, ending in a ſmall point ; common petiole ſharp-pointed, remaining after the fall of the leaflets, and becoming a permanent, woody, ſharp thorn about two inches long, and marked with the ſcars of the fallen leaflets ; ſtipules half-embracing the ſtem, membranous at their edges, ending in two ſharp ſpines. *Flowers* yellow, nearly ſeſſile, axillary, ſolitary, or in pairs ; calyx ſmooth, oblong, or cylindrical. *Legume* an inch long, ſtraight, ſmooth, acuminate. A native of Siberia and China. On account of its long, tough branches, and large ſtrong thorns, it is well adapted to make an impenetrable hedge ; and, as it is covered with flowers near the whole of the ſummer, is at the ſame time a very ornamental plant. It has the additional recommendation of being hardy, and able to bear the winters of our climate without injury. 4. C. *argentea*, Lam. Ill. Pl. 607. *fig*. 3. (Robinia halodendron, Pall. Travels, vol. ii. p. 471. t. w. German, vol. iii. pl. 6. p. 153, French Tranſlation, Linn. jun. Supp. 330.) "Leaflets in about two pairs, oblong, mucronate, waved, covered with a ſilvery down ; ſtipules and petioles ſpineſcent ; peduncles three-flowered." A ſhrub, four or five feet high, covered in all its parts with a whitiſh down, which gives it a ſilky appearance. *Branches* numerous, ſpreading, angular, in conſequence of three nerves proceeding from the baſe of each ſtipule. *Leaves* alternate ; leaflets enlarged towards their ſummit ; common petiole permanent, changing into a ſtraight, ſharp thorn, about an inch long ; ſtipules ſhort, recurved, ſpiny. *Flowers* reddiſh or purpliſh, ſweet-ſcented, axillary, often ſix-petalled, owing to the wings being doubled. *Legumes* ſhort, inflated, hard, remaining till the ſecond year. A native of Siberia, in dry, naked, ſalt ground, near the river Irtis. It flowers on its native ſoil in June, but has never produced flowers in our gardens, probably for want of the ſaline principle. Introduced by Dr. W. Pitcairn, in 1779. 5. C. *chamlagu*, (Robinia chamlagu, L'Herit. Stirp. Nov. 161. tab. 77. Aiton. Kew. iii. 54.) "Leaves in two pairs, petioled ; pairs diſtant ; ſtipules ſpineſcent ; peduncles one-flowered." A handſome ſhrub, much-branched, quite ſmooth, four or five feet high. *Branches* ſpreading, angular. *Leaves* alternate, or faſciculated, two or three together on the knots of the old branches ; common petiole ending in a ſhort, ſpiny point, deciduous, a little after the leaflets, not becoming a thorn. *Flowers* large, yellowiſh, axillary. A native of China, where it is called *chamlagu*. Introduced by Monſ. Richard, in 1773. 6. C. *digitata*, (Robinia fruteſcens, Linn. Sp. Pl. Aſpalathus fruteſcens major cortice aureo, Amm. Ruth. p. 206. n. 283.) "Leaves on ſhort petioles ; leaflets four, growing cloſe together in a digitate manner ; ſtipules ſomewhat ſpineſcent ; peduncles one-flowered." A ſhrub, about three feet high, branched from the bottom. *Branches* rod-like, pliant, of a ſhining yellowiſh colour, angular, loaded with leaves and flowers. *Leaves*, on the ſhoots of the year, alternate, with ſpineſcent ſtipules ; from the buds in bundles with unarmed ſtipules ; leaflets cluſtered, inverſely egg-ſhaped, attenuated at the baſe, ending in a ſmall, ſharp point ; petiole very ſhort, remaining after the leaflets, and hardening with the ſtipules into a triple ſpine. *Flowers* large, yellow, axillary ; peduncle jointed near the middle. There is a variety with longer, narrower leaves, which La Marck ſuppoſes is the *robinia pygmæa* of Linnæus and Pallas, but obſerves that the leaves in his plant are not ſo very obtuſe as Linnæus deſcribes them. Linnæus allows that his pygmæa reſembles the preceding, but ſays that it is of a dwarf ſtature, and more thorny. Both kinds were cultivated by Miller, who conſidered them as diſtinct. The Altaic plant, deſcribed by Pallas, is ſcarcely a ſpan high in its native ſoil, but grows larger when cultivated in gardens.

CARAGAS, in *Geography*, a province of Mindanao, in the Eaſt Indies, ſituate on the eaſtern coaſt, between Suliago and the Cape of St. Auguſtin, which lie north and ſouth. The ſeas on this coaſt are ſtormy. Caragas, as well as other parts of Mindanao, produces in great abundance that ſort of palm-trees, which are called ſagu, of the pith of which, reduced to meal, they make bread and biſcuit through the whole iſland, and more eſpecially on the coaſt of this province, near the river Butuan. The inhabitants of Caragas are a warlike people, and are accounted very brave, when employed either by ſea or land.

CARAGI, in *Commerce*, a name given to duties paid at the cuſtom-houſe in the territories of the grand ſignior, on the importation or exportation of goods. The term is alſo applied to the officers of the cuſtom-houſe, who collect theſe duties.

CARAGLIA, in *Geography*, a town of Piedmont, in the province of Coni ; 5½ miles N.W. of Coni.

CARAGNA, or KARAGNA, in *Pharmacy*. See CARANNA.

CARAGROUCH, a ſilver coin of the empire, weighing nine drams, which does not quite amount to a French crown, of three livres Tournois. At Conſtantinople it goes at 120 aſpers. There are four ſorts of them, equally current, and of the ſame value.

CARAGUATA, in *Botany*, Plum. gen. 10. See TILLANDSIA.

CARAHISSAR, in *Geography*. See APHIOM KARA-HISSAR.

CARAIBES. See CARIBBEES.

CARAIGOI, CARIGUEYA, or CARIGUEIA, in *Zoology*, according to Marcgrave, Piſa, and ſome other authors, the Braſilian name of the Virginian opoſſum. See DIDELPHIS *opoſſum*.

CARAIPA, in *Botany*, Lam. Enc. Juſſieu 434. Aubl. Guiana 561. a genus imperfectly known. Claſs and order, *polyandria monogynia*. *Cal.* Perianth deeply divided into five round ſegments. *Cor.* unknown. *Piſt.* Germ ſuperior. *Peric.* Capſule ſomewhat woody, rather three-ſided, acute, and recurved at its ſummit, three-celled, opening from the ſummit to the baſe with three permanent valves. *Seeds* one in each cell ; angular on the inner, convex on the outer ſide, attached to a large three-winged receptacle, which uniting with the valves, forms the partitions of the cells.

Sp. 1. C. *parvifolia*, Aub. tab. 223. fig. 1. "Leaves egg-ſhaped, acute, white with down underneath." A tree from fifteen to twenty feet high, much branched near the top.

*Branches* reddiſh. *Leaves* alternate, petioled, entire; ſtipules two, oppoſite, caducous. *Flowers* in terminal cluſters; capſules hairy. 2. C. *longifolia*, Aubl. tab. 223. fig. 2. “Leaves oblong egg-ſhaped, acute, grey underneath.” A larger and higher tree than the preceding. *Leaves* eight inches long, and three broad. 3. C. *latifolia*, Aub. tab. 224. fig. 3. “Leaves broad-egg-ſhaped, acuminate, aſh-coloured underneath.” 4. C. *anguſtifolia*, Aubl. tab. 224 fig. 4. “Leaves long, egg-ſhaped, acuminate, white underneath.” *Leaves* with more numerous lateral nerves, ten inches long, and two and a half broad. All the ſpecies are found in the foreſts of Guiana. The ſecond is called caripe by the natives.

CARAITES, or KARAITES, קראים, from קרא, *kera*, to read, a ſect among the ancient Jews: whereof there are ſtill ſome ſubſiſting in Poland, Ruſſia, Conſtantinople, Cairo, and other places of the Levant; though few or none are to be found in theſe weſtern countries. About the middle of the 16th century, a particular account was taken of their number; which in Poland was 2000; at Caſſa, in Crim Tartary, 12,000; at Cairo, 300; at Damaſcus, 200; at Jeruſalem, 30; in Babylon, 100; in Perſia, 600; amounting in the whole to 15,230, and being a ſmall number compared with the Rabbiniſts. It is their diſtinguiſhing tenet and practice to adhere cloſely to the words and letter of the Scripture, (as their name imports) excluſive of allegories, traditions, and the like.

Leo of Modena, a Rabbin of Venice, obſerves, that of all the hereſies among that people, before the deſtruction of the temple, there is none now left but that of the Caraim, a name derived from *micra*, which ſignifies the pure text of the Bible; becauſe of their keeping to the Pentateuch, obſerving it to the letter, and rejecting all interpretations, paraphraſes, and conſtitutions of the Rabbins. Aben Ezra, and ſome other Rabbins, treat the Caraites as Sadducees; but Leo de Juda calls them, more accurately, Sadducees reformed; becauſe they believe the immortality of the ſoul, paradiſe, hell, reſurrection, &c. which the ancient Sadducees denied. He adds, however, that they were doubtleſs originally real Sadducees, and ſprung from among them.

M. Simon, with more probability, ſuppoſes them to have riſen hence; that the more knowing among the Jews, oppoſing the dreams and reveries of the Rabbins, and uſing the pure texts of Scripture to refute their groundleſs traditions, had the name of Caraim given them; which ſignifies as much as the barbarous Latin, *Scripturarii*, i. e. people attached to the text of Scripture. The other Jews give them the odious name of Sadducees, from their agreement with thoſe ſectaries on the head of traditions. The real fact ſeems to have been, that the traditionary law was oppoſed, as a corruption of the true religion, by a numerous body, who ſtrenuouſly aſſerted the ſufficiency and perfection of the ancient written law, explained in its literal ſenſe. Among theſe were the Sadducees. But it is very probable, that the Sadducean tenets were highly offenſive to many pious men, who nevertheleſs were not diſpoſed to join thoſe who received the traditionary inſtitutions. Theſe, adhering ſimply to the letter of the Moſaic law, but at the ſame time refuſing to adopt the doctrine of the Sadducees, would of courſe become a ſeparate ſect, which would be diſtinguiſhed by ſome name expreſſive of their leading principle. It is not improbable that the oppoſite party gave them, in deriſion, the name of Scripturiſts, or Caraites. Hence we may conclude, that this ſect aroſe at the ſame time with thoſe of the Sadducees and Phariſees. From the Jewiſh records it may be inferred, that this ſect exiſted in the time of Hyrcanus. Accordingly it has been ſaid, that upon the diſſenſions between Hillel, the preſident of the Sanhedrim, and Shammai the vice-preſident, about 30 years before Chriſt, their reſpective ſcholars formed two parties, and took different names. Thoſe who adhered to Scripture only were called Caraim, or Scripturarii, and were followers of Shammai; and thoſe who were zealous for the traditions taught by the Scribes, or Rabbis, were called Rabbanim, Rabbiniſts, and were followers of Hillel. The Caraites juſtly boaſted the high antiquity of their principles, as being the followers of Moſes and the prophets, in oppoſition to human tradition; but when the doctrines of the Rabbis were generally adopted among the Jews, the Caraites were conſidered as ſchiſmatics. Scaliger, Voſſius, and Spanheim, erroneouſly, rank the Caraites among the Sabeans, Magi, Manichees, and Muſſulmen. Wolfang, Fabricius, &c. ſay, the Sadducees and Eſſeni were called Caraites, in oppoſition to the Phariſees: others take them for the doctors of the law ſo often mentioned in the goſpel: and in favour of this conjecture, has been alleged a tradition preſerved in the Jeruſalem Talmud, that there were in Jeruſalem 480 ſynagogues, each of which had a ſeparate apartment for the law, and another for the Talmud, or traditionary records: whence it has been inferred, that the Scripturiſts were a party diſtinct from the Traditionaries. The Scribes, whoſe office it was to expound the law, from the manner in which they are uſually mentioned in the New Teſtament, in conjunction with the Phariſees, may be concluded to have adopted, in their interpretations, the allegorical method of the Traditionaries and Cabbaliſts, and therefore to have commonly belonged to their party. Joſephus and Philo make no mention of them; whence it has been inferred, that they were more modern than either of thoſe authors. Perhaps, this ſect was not formed till after the collection of the ſecond part of the Talmud, or the Gemara; or not till after the compiling of the Miſchna.

The Caraites themſelves pretend to be the remains of the ten tribes led captive by Shalmaneſer. Wolfius, from the memoirs of Mardacheus, a Caraite, refers their origin to a maſſacre among the Jewiſh doctors, under Alexander Jannæus, their king, about one hundred years before Chriſt: becauſe Simeon, ſon of Schetach, and the queen's brother, making their eſcape into Egypt, there forged his pretended traditions; and, at his return to Jeruſalem, publiſhed his viſions, interpolating the law after his own fancy, and ſupporting his novelties on the notices which God, he ſaid, had communicated by the mouth of Moſes, whoſe depoſitary he was: he gained many followers; and was oppoſed by others, who maintained, that all which God had revealed to Moſes was written. Hence the Jews became divided into two ſects, the Caraites and Traditionaries: among the firſt, Juda, ſon of Tabbai, diſtinguiſhed himſelf; among the latter, Hillel. Wolfius reckons not only the Sadducees, but alſo the Scribes, in the number of Caraites. But the addreſs of the Phariſees prevailed againſt them all; and the number of Caraites decreaſed: and they long remained in obſcurity. At length, about the year of our Lord 750, Anan, a Babyloniſh Jew of the race of David, and Saul his ſon, both men of learning, publicly diſclaimed the authority of the traditionary doctrines of the Talmud, aſſerted the Scriptures to be the ſole rule of faith, and became heads of the Caraites, or Scripturarii, who again grew into repute, and increaſed in numbers. To this late period ſome have aſcribed the riſe of the Caraites. See Maſclef's Heb. Gram. vol. ii. p. 10. But from the hiſtory of the Rabbi Anan, who incurred great obloquy from the Phariſaical Rabbis for his hereſy, it clearly appears, that he was not the author, but the reſtorer of the Caraite ſect. Rabbi Schalomon, in the ninth century, maintained its credit; and among other perſons well ſkilled in the Jewiſh law, who adhered to it, we may mention Abu-Alphareus, who lived in Paleſtine, and wrote a commentary upon the Pentateuch, which added ſo much ſtrength to the intereſt of the Caraites, that the traditionary party thought it neceſſary to implore the aſſiſtance of the civil magiſtrate. Notwithſtanding this, however, they continued to hold their aſſemblies, and ſubſiſted, though in a declining ſtate.

The Caraites are but little known; their works coming only into very few hands, even among the greateſt Hebraiſts. Buxtorf never ſaw more than one; Selden two; but Mr. Trigland ſays, he has recovered enough to ſpeak of them with aſſurance. He aſſerts, that ſoon after the prophets had ceaſed, the Jews became divided on the ſubject of works, and ſupererogation: ſome maintaining their neceſſity from tradition; whilſt others, keeping cloſe to the written law, ſet them aſide; and it was from theſe laſt that Caraitiſm commenced. He adds, that after the return from the Babyloniſh captivity, the obſervation of the law being to be re-eſtabliſhed, there were ſeveral practices found proper for that end; and theſe, once introduced, were looked upon as eſſential, and appointed by Moſes; which was the origin of Phariſaiſm; as a contrary party, continuing to keep cloſe to the letter, founded Caraitiſm.

The modern Caraites, Leo of Modena obſerves, have their ſynagogues and ceremonies; they pretend to be the ſole proper Jews, or obſervers of the laws of Moſes: calling the reſt by the term *Rabbanin*, or *followers of the Rabbins:* theſe hate the Caraites mortally; refuſing to ally, or even to converſe with them, and treating them as *momzerim*, or baſtards; becauſe of their rejecting the conſtitutions of the Rabbins relating to marriages, repudiations, purifications of women, &c. This averſion is ſo great, that if a Caraite would become a Rabbiniſt, he would never be received by the other Jews.

The Caraites, however, do not abſolutely reject all kinds of traditions; but only ſuch as do not appear well grounded. Selden, who is very expreſs on this point, in his "Uxor Hebraica," obſerves, that beſides the mere text, they have certain interpretations, which they call *hereditary*, and which are proper traditions. Their theology only ſeems to differ from that of the other Jews, in that it is purer and clearer of ſuperſtition: they give no credit to the explications of the Cabbaliſts, chimerical allegories, nor to any conſtitutions of the Talmud, but what are conformable to the Scripture, and may be drawn from it by juſt and neceſſary conſequences.

Peringer obſerves of the Caraites in Lithuania, that they are very different, both in aſpect, language, and manners, from the Rabbiniſts, wherewith that country abounds. Their mother tongue is the Turkiſh; and this they uſe in their ſchools and ſynagogues. In viſage they reſemble the Mahometan Tartars. Their ſynagogues are placed north and ſouth; and the reaſon they give for it is, that Shalmaneſer brought them northward: ſo that in praying, to look to Jeruſalem, they muſt turn to the ſouth. He adds, that they admit all the books of the Old Teſtament; contrary to the opinion of many of the learned, who hold that they reject all but the Pentateuch.

Caleb, a Caraite, reduces the difference between them and the Rabbiniſts to three points: 1. In that they deny the oral law to come from Moſes, and reject the Cabbala. 2. In that they abhor the Talmud. 3. In that they obſerve the feaſts, as the ſabbaths, &c. much more rigorouſly than the rabbins do. To this may be added, that they extend the degrees of affinity, wherein marriage is prohibited, almoſt to infinity. Their diſtinguiſhing tenets may be ſummed up in the following particulars: that there is no other rule of faith and worſhip beſides the writings of Moſes and the prophets: that all oral traditions, and all allegorical and myſtical interpretations of the law are to be rejected: that all material beings were created by an uncreated Deity, of whom no reſemblance can be found in any thing which he has made: that he knows all things, and exerciſes a conſtant providence over all his works: that the human mind is ſubject to divine influence, but at the ſame time remains free in its volitions: that true penitence takes away guilt: that after death, the ſoul, if it be worthy, aſcends to the intellectual world, to live there for ever; but if it be guilty, it is conſigned to a ſtate of pain and ignominy: that God alone is to be worſhipped; and that faſts are to be ſtrictly obſerved. The preſent adherents of this ſect are ſaid to obſerve the moral precepts of their law more ſtrictly than their brethren, the Phariſaic Rabbinites, with whom, nevertheleſs, they are thought unworthy of eccleſiaſtical communion. Upon the whole, the Caraites are univerſally reckoned men of the firſt learning, of the greateſt piety, and of the pureſt morals of the whole nation.

See on this ſubject, Relandi Antiq. Hebræor. part ii. cap. 9. § 12. Trigland. de Secta Karæorum. Baſnage's Hiſt. of the Jews, book ii. chap. 8, 9. Brucker's Hiſt. Phil. by Enfield, vol. ii. p. 174, &c.

CARALIA, in *Ancient Geography*, a town of Aſia, in Pamphylia.

CARALIS, or Carales, now *Cagliari*, a town of the iſland of Sardinia, the capital, according to Florus, pillaged by Gracchus. It was of Phœnician foundation, according to Pauſanias, and had the right of Roman citizenſhip, according to Pliny. Ptolemy mentions a promontory and gulf of the name of "Carallis."

CARALLIA, or Carallis, an epiſcopal town of Aſia in Iſauria, according to Steph. Byz. or, according to the Notitia, in Pamphylia.

CARAMAN, in *Geography*, a town of France, in the department of the Upper Garonne, and chief place of a canton in the diſtrict of Ville-Franche; 5 leagues E.S.E. of Toulouſe. The place contains 2,292, and the canton 9,161 inhabitants; the territory includes 152½ kiliometres and 20 communes.

CARAMANGCE, in *Commerce*, a drug which comes from China. The Tonquineſe value it very much.

CARAMANIA, in *Geography*, one of the diviſions of Aſia Minor, now a province of Turkey in Aſia, ſituate on the ſouthernmoſt part, and extending from north to ſouth along the Mediterranean coaſt, which is its ſouthern boundary. It formerly comprehended the ancient countries of Lycia, Pamphilia, Piſidia, Lycaonia, Iſauria, Cilicia, part of Phrygia, Galatia, and Cappadocia. The Turks call the whole province Caraman-Ili. Its capital is Satalia. This province anciently belonged to the Caramanian princes, and was the laſt that ſubmitted to the arms of the Ottomans, about the year 1488. Caramania may be divided into Greater and Leſſer; the former comprehending all that part which lies to the north of mount Taurus, and the latter that part which lies ſouthward along the coaſt. The coaſt of Caramania is for the moſt part mountainous, and above theſe high mountains it is not uncommon to ſee, in clear weather, a very ſmall black cloud, no bigger than a bird. This globe of vapours is ſubject to great agitation; at firſt it is very ſmall, then ſuddenly ſpreads, contracts, appears and diſappears at intervals above the mountain, and changes its form every inſtant. How calm ſoever the atmoſphere may be, a ſudden and violent ſquall may be expected at the ſight of theſe inſulated clouds, which diſcharge the wind with ſo much rapidity and vehemence, that if a ſhip be not prepared to be overtaken by it, ſhe runs a great riſk of loſing part of her ſails, and even her maſts and yards. During the calm which precedes the ſtorm, a numerous ſhoal of fiſhes, cleaving the water level with its ſurface, and even darting above it, moves with great rapidity; and the agitation of theſe inhabitants of the depths of the ſea is always a certain preſage of an approaching and violent agitation in the atmoſphere and the waters.

CARAMANICO, a town of Naples, in the province of Abruzzo Citra.

CARAMANTA, a province of Terra Firma in South America, lying on the river Cauca, bounded N. by the diſtrict of Carthagena, E. by New Granada, and S. and W. by Popayan, in the audience of Sta. Fe. It is a valley ſurrounded by high mountains; and the natives extract from its waters very good ſalt. The capital, of the ſame name, lies in N. lat. 5° 18′. W. long. 72° 55′.

CARAMBIS, in *Ancient Geography*, a promontory of Aſia Minor, in the moſt northern part of Galatia, according to Ptolemy, and, according to Salluſt, between Heraclea and Paphlagonia; now "Capo Piſello."—Alſo, a town of Aſia in Paphlagonia.

CARAMBOLA, in *Botany*, Rheed. Mal. 3. 51. Burm. Zeyl. 148. Ind. 106. See AVERRHOA *Carambola*.

CARAMBU, Rheed. Mal. 2. 55. See JUSSIEUA *ſuffruticoſa*.

CARAMNASSA, in *Geography*, a river of Hindooſtan, which runs into the Ganges, near Buxar, in the country of Benares.

CARAMOUSSAL, in *Naval Architecture*, a Turkiſh veſſel, having a very high ſtern, and rigged nearly like a ketch; that is, it has main and mizen maſts and bowſprit, but neither foremaſt nor top-gallant maſts.

CARAMUEL DE LOBKOWITZ, JOHN, in *Biography*, was born at Madrid in 1606; and having entered into the Ciſtercian order, he poſſeſſed various church preferments in the Low Countries and in Germany, and at length became grand vicar of cardinal Harrach, archbiſhop of Prague. But ſuddenly abandoning the church, he aſſumed the military profeſſion, and in this capacity commanded a company againſt the Swedes, and acted as engineer and ſuperintendant of the fortifications in Bohemia. He then reſumed his former eccleſiaſtical character; and was ſucceſſively biſhop of Konigſgratz in Bohemia, of Campagna in Naples, and of Vigevano in the Milaneſe, at which latter place he died in 1682. His works are numerous, and indicate a ſingular genius; and it was ſaid of him, that he had invention in the eighth, or higheſt degree, eloquence in the fifth, and judgment in the ſecond. His "Eſſay on Cabaliſtic Grammar," was publiſhed at Bruſſels in 1642; and his "Daring or Audacious Grammar," at Frankfort in 1654. He wrote a large volume on the architecture of the temple of Solomon; and publiſhed at Vigevano a work, entitled "Λεπτοτατος, i. e. Subtiliſſimus, vel Nova Dialectico-Metaphyſica," diſtinguiſhed more by ſubtilty than by clearneſs and ſound ſenſe. He was a ſtrenuous defender of the doctrine of probability, and alſo of the infallibility of the pope. His theological writings that have been printed, amount to 7 vols. fol. Nouv. Dict. Hiſt.

CARAN, in *Geography*, a river of England, which runs into the Avon at Tewkeſbury in Glouceſterſhire.

CARANA, in *Ancient Geography*, a town of Aſia, in the Greater Armenia, which, according to Strabo, gave its name to the province "Caranitis." Steph. Byz. places Carana, which he ſays was built by the Romans, and alſo Caranitis, in Galatia.

CARANASI, in *Botany*, Rumph. Aub. 5. 49. See CAPPARIS *cruſtacea*.

CARANDA, a genus eſtabliſhed by Gærtner for a kind of palm, deſcribed by Rumphius, the fructification of which is imperfectly known. *Spadix* and *ſpatha* not known. *Cal.* coriaceous, three-leafed. *Cor.* none. *Peric.* none. *Seed* ſuperior, naked, pedicelled, affixed ſingly, or two or three together, to the baſe of the calyx. It is called, in the iſland of Ceylon, Ghalkarande, which means the ſtone kharande, to diſtinguiſh it from another kharande, or carandas, which Gærtner thinks is a ſpecies of Raudia; but, in his opinion, even a blind man may ſee that the ſeed deſcribed by him belongs to the family of palms. Linnæus refers a Carandas of Rumphius to his Cariſſa carandas.

CARANGAS, in *Geography*, a province and juriſdiction of South America, belonging to the archbiſhopric of Plata, which begins 70 leagues W. from the city of Plata, and extends above 50 leagues. The climate of this province is ſo cold that it is barren in corn and grain, &c. but it abounds in cattle. Here are a great number of ſilver mines conſtantly worked, among which that called Turco is very remarkable for a ſort of ore termed by miners Machacado; the fibres of the ſilver forming an admirable intertexture with the ſtone in which they are contained. Such mines are generally the richeſt. There are others found in the barren ſandy deſerts extending towards the weſt of the South Sea; in which are found, by digging in the ſands, detached lumps of ſilver, not mixed with any ore or ſtone, beſide that which adheres in ſome parts to the metal. The lumps are called "Papas," becauſe they are dug out of the ground like that root; and they have the appearance of melted ſilver; which proves that they are formed by fuſion. The ſize and figure of theſe lumps are very different, weighing from 2 to 60 and 150 marks; theſe laſt being a Paris foot in length. Juan and Ulloa's Voyage to S. America, by Adams, vol. ii. p. 153.

CARANJA, an iſland in the Indian ſea, near the Concan coaſt; 3 leagues S. of Bombay. N. lat. 18° 55′. E. long. 72° 44′.

CARANNA, in *Commerce*, a hard, brittle, reſinous gum, brought from ſome parts of the Weſt Indies, as Carthagena and New Spain; of an aromatic flavour; and ſometimes uſed in medicine as a cephalic.

The trees from which it runs, are like the palm-tree. When it is freſh, it is white; but as it grows ſtale, it becomes greyiſh inclining to green, in which condition it is ſent to Europe, where the white is ſeldom to be met with. It is brought in lumps wrapped up in leaves. To be of the beſt quality, it muſt be ſoft, of a pleaſant aromatic ſmell, and as white as ſnow. As this gum is very dear, it is ſeldom ſold unadulterated; and other ſorts are often ſubſtituted in its ſtead, which have not the ſame properties. When applied to the head, it has an extraordinary virtue to relieve it from pain; which renders it highly valuable. It produces the ſame effects in the joints; and is ſo much eſteemed in medicine, that it is become a proverb in pharmacy to ſay, Whatever the *tacamahaca* has not cured, the *caranna* will.

The Americans make a balm of it, which they pretend to be a ſovereign remedy for the cure of wounds, and the hæmorrhoids or piles.

CARANUS, in *Ancient Geography*, was, according to Strabo, the port of Aradus, ſituate in Syria, 7 leagues S.W. of Paltus.

CARANUSCA, a town of Belgic Gaul, occupying, as d'Anville thinks, the ſpot now called "Garſch," between Metz and Treves.

CARAPA, in *Botany*, Lam. Encyc. Aub. Guian. (Perſoonia, Willd.) Claſs and order, *octandria monogynia*.

Gen. Ch. *Cal.* perianth four-cleft. *Cor.* petals four; nectary cylindrical, eight-toothed, bearing the anthers. *Stam.* eight. *Piſt* germ ſuperior; ſtyle none; ſtigma large, ſalver-ſhaped. *Peric.* capſule one-celled, four-valved. *Seeds* numerous, angular, of various ſhapes, of a ſolid white ſubſtance, covered with a reddiſh, coriaceous ſkin, united together in an egg-ſhaped maſs, which entirely fills the capſule. La Marck. Willd. with the aſſiſtance of La Marck's figure.

Sp. 1. C. *guianenſis*, Aubl. Guian. Supp. p. 38. tab. 387. Lam. Ill. Pl. 301. (Perſoonia guareoides, Willd.) "Leaflets in numerous pairs, oblong, acuminate." A tree ſixty or eighty feet high, three or four feet in diameter. *Leaves* three feet long, alternate, abruptly winged; leaflets large, entire, ſmooth, ſometimes in not leſs than nineteen pairs. *Flowers* in compound racemes. A native of Guiana, where a thick bitter oil is expreſſed from the ſeeds, with which the inhabitants anoint themſelves as a ſecurity againſt the bite of inſects. Excellent maſts for ſhips are made of the trunk. 2. C. *moluccenſis*, Lam. Enc. (Granatum littoreum ſive martahal, Rumph. Amb. 3. p. 92. tab. 61.) "Leaflets in about three pairs, acutely egg-ſhaped." A tree ſmaller than the preceding, ſometimes producing two or three ſtems from the ſame root. *Leaves* four or five inches long; leaflets ſmooth. *Flowers*, according to Rumphius, dioicous, yellowiſh, ſmall, ſcentleſs, in compound, axillary racemes. *Fruit* large, containing from twelve to twenty ſeeds, ſimilar to thoſe of the preceding ſpecies.

As two other genera have been named in honour of Perſoon, one from New Holland, by Dr. Smith, and another from North America, by Michaux, we have retained the original name given by Aublet, though it muſt be acknowledged to be exceptionable, on account of its reſemblance to Caraipa, another of Aublet's genera.

CARAPACE, the thick, ſolid, firm ſhell, which covers the turtle or tortoiſe; and to which adhere thoſe fine tranſparent ſhells, which are known under the name of tortoiſe-ſhell, of which ſnuff-boxes and ſeveral ſorts of inlaid work are made.

CARAPALLA, in *Geography*, a river of Italy, in the kingdom of Naples, and province of Capitanata, which runs into the Adriatic; 9 miles S. of Manfredonia.

CARAPANATUBA, a river of Guiana, which empties itſelf into the Amazon, at about one third of a degree of the equator above fort Macapa. By the treaty between France and Portugal, 29th September 1801, it was concluded that the boundaries of French and Portugueſe Guiana ſhall be determined in future by that river. Theſe limits ſhall follow the courſe of the river to its ſource, whence they ſhall take a direction to the grand chain of mountains which divides the two rivers, and follow the windings of that chain to the point neareſt to Rio Branco, between the ſecond and third degree N. of the equator.

CARAPE, in *Ancient Geography*, a town of Aſia, in the interior part of the Leſſer Armenia, towards the mountains. Ptolemy.

CARAPICHEA, in *Botany*, Aubl. Guian. See CALLICOCCA *carapichea*.

CARAPITO, in *Geography*, a town of Portugal, in the province of Beira; 4 leagues N. of Pinhel.

CARAPO, in *Ichthyology*, a fiſh deſcribed by Marcgrave, of which he ſays there are two kinds, the firſt having a long and thin body, like a knife-blade, with the back thick, the belly very thin and narrow, and the tail pointed; the ſecond narrower in proportion to its length, and without ſpots. The head of both is flat and pointed, and the lower jaw runs out a little farther than the upper. The latter character ſeems to prove that theſe fiſhes are varieties of *Gymnotus faſciatus*, rather than of *Gymnotus carapo*, as ſome writers imagine. Gmelin conſiders the *Carapo* of Marcgrave as his *Gymnotus carapo*, which cannot be the fact if we may depend on Marcgrave, the Gmelinian fiſh of that name having the upper jaw longeſt inſtead of the lower one. See GYMNOTUS *carapo*, and *faſciatus*.

CARARA, in *Botany*. Piſ. Braſ. tab. 241. See AMARANTHUS *viridis*.

CARARA, in *Commerce*, a weight at Leghorn, and in other parts of Italy, uſed in the ſale of wool and cod-fiſh, equivalent to ſixty pounds of that country.

CARARA, anciently *Luna*, in *Geography*, a ſmall town of Tuſcany, celebrated for the white marble which was dug in its quarries, and which was not inferior to the marble of Paros either with reſpect to the fineneſs of its grain, or the beauty of its whiteneſs. The fineſt ſpecies of this marble is almoſt as hard as porphyry.

CARAROS, or CARARUS, in *Ancient Geography*, a town of Africa Propria, in the vicinity of Targarum.

CARASCHULLI, in *Botany*. Rheed. Mal 2. tab. 47. See BURLERIA *buxifolia*.

CARASCOF, in *Geography*, a town of Poland, in the palatinate of Kiov, 34 miles W. of Bialacerkiew.

CARASOU, a town of Leſſer Tartary in the Crimea, once very populous, but burnt by the Ruſſians in 1737.—Alſo, the name of two rivers in Turkey, one of Natolia, in Caramania, the other in Romania.—Alſo, the name of a lake, being part of the canal which forms the moſt ſoutherly mouth of the Danube, called by the Turks "Carakirmen."

CARASSIUS, in *Ichthyology*, a ſpecies of CYPRINUS, which inhabits the freſh waters of Europe; *Caraſſius* of Marſ. Danub. ſuppoſed by ſome to be the ſame with the Rud of Engliſh writers. See CYPRINUS *caraſſius*. Obſ. Among the old writers caraſſius was conſidered as a kind of generic name for the carp, bream, &c.

CARASYRA, in *Ancient Geography*, one of the forts of Thrace, erected by the emperor Juſtinian in the province of Rhodope.

CARAT. See CARACT.

CARATÆ, in *Ancient Geography*, the name of a people who formed part of the ancient Jacæ, and who inhabited the coaſt of the Caſpian Sea, on the banks of the Jaxartes.

CARA-TARTARS, in *Geography*, or *black Tartars*, a people of Aſia; formed by a body of Turks, incorporated by Kuli-khan the grandſon of Gengiſ-khan in his army, when he was ſent to Iran by Mangou-chan, his brother, emperor of the Moguls. They now occupy the countries of Geta and Touran in Aſia.

CARATCHOLIS, a people of Aſia in Georgia, N. of mount Caucaſus. They are alſo called "Karakinks" and black Circaſſians.

CARATING, in *Chemiſtry*, a term uſed to denote the mixture or combination of gold with other metals. Thus, "red carating" expreſſes the mixture of gold with copper, to diſtinguiſh it from the leſs uſual one, made with ſilver, and denominated "white carating," and alſo in contradiſtinction to the "mixed carating" or combination of gold, ſilver, and copper. The degree of this combination or alloy is expreſſed by carats and grains. See CARACT.

CARATTERE, *Ital.* character. A muſical term, in ſpeaking of a ſong of two ſtrains; *aria di due caratteri*; of which the firſt is generally *cantabile*, and the ſecond *bravura*. See CANTABILE and BRAVURA.

CARAVACA, or *St. Cruz de Caravaca*, in *Geography*, a town a town of Spain, in the province of Murcia; 40 miles W S.W. of Murcia.

CARAVAGA, a river of Peru in South America, famous for its golden ſands.

CARAVAGGIO, in *Biography*. See ANGELO AMERIGI.

CARAVAN, or CARAVANNE, in the eaſt, a troop or company of travellers, merchants, and pilgrims, who for their greater ſecurity march in a body through the deſerts, and other dangerous places, infeſted with Arabs and robbers.

The word comes from the Arabic *cairawan*, or *cairoan*; and that from the Perſian *kèrvan*, or *cârvân*, *negociator*, *a trader*, or *dealer*. Vid. Peritiſ. Itin. Mund. ed. Hyde. p. 61.

There is a chief, or aga, called "caravan-bachi," who commands each caravan, and has under him a number of janizaries, or other forces, ſufficient for their defence. The caravans encamp every night near wells, or rivulets known to the guides; and obſerve a diſcipline as regular as in war. They chiefly uſe camels for their vehicles, becauſe of their enduring much fatigue, eating little, and paſſing three or four days without drinking.

In this manner trade was carried on, particularly by the nations near the Arabian gulf, from the earlieſt period to which hiſtorical information reaches. See CAMEL.

The grand ſignior gives one fourth part of the revenue to Egypt, to defray the expence of the caravan that goes yearly from Cairo to Mecca, to viſit Mahomet's tomb: the devotees, in this caravan, are from 40,000 to 70,000; accompanied with ſoldiers to protect them from the pillage of the Arabs, and followed with 8 or 9,000 camels, laden with all neceſſary proviſions for ſo long a paſſage acroſs deſerts.

There are two regular caravans which go yearly to Mecca; the firſt from Damaſcus, compoſed of the pilgrims from Europe and Aſia; the ſecond from Cairo, for the Mahometans of Barbary.

Damaſcus is the grand rendezvous for all the pilgrims from the north of Aſia, as Cairo is for thoſe from Africa. Beſides the natives of Aleppo who go to Mecca, numbers from Perſia and the northern provinces aſſemble in that city in their way to Damaſcus, for which place the caravan ſets out immediately after the leſſer Bairam. When the caravan ſets out from Aleppo, it is conveyed for a few miles by the governor and grandees in proceſſion, and many of the pilgrims being accompanied ſtill farther in their way by their women and kinſmen, all is in commotion on the road to Damaſcus for ſeveral days after the Bairam. However, the number of pilgrims who go from Aleppo to Mecca is ſaid to be much leſs conſiderable now than formerly. This probably is owing in part to the decaying ſpirit of Mohammediſm, but more to the decline of the trade with Mecca; for it was uſual with the merchants, formerly, to make the journey ſeveral times in their life, and the caravans were accuſtomed to return, laden with Indian and Arabian merchandize. After the junction of the caravans from other towns at Aleppo, it proceeds to Damaſcus; and the number of pilgrims every year is ſaid to amount to from 30 to 50,000; many of them repair hither four months before the time, but the greateſt number only at the end of the Ramadan. Damaſcus then reſembles an immenſe fair; nothing is to be ſeen but ſtrangers from all parts of Turkey, and even Perſia; and every place is full of camels, horſes, mules, and merchandize. At length, after a preparation of ſome days, this vaſt multitude ſet out confuſedly on their march, under the conduct of the baſhaw or pacha of Damaſcus, and, travelling by the confines of the deſert, arrive in 40 days for the feſtival of Bairam at Mecca; the diſtance between the two cities being, according to the moſt moderate eſtimate, above a thouſand miles. As this caravan traverſes the country of ſeveral independent Arabs, it is neceſſary to make treaties with the Bedouins, to allow them certain ſums of money, for a free paſſage, and to take them for guides. On this ſubject frequent diſputes occur between the Scheiks, of which the pacha avails himſelf to make a better bargain; but in general the preference is given to the tribe of Sardia, which encamps to the ſouth of Damaſcus, along the Hauran: the pacha ſends to the Scheik a mace, a tent, and a peliſſe, to ſignify that he takes him as his chief conductor. From this moment it is the Scheik's buſineſs to furniſh camels at a ſtated price; theſe he hires likewiſe from his tribe and his allies: the pacha is reſponſible for no damages, and all loſſes are on his own account. On an average, 10,000 camels periſh yearly; which form a very advantageous article of commerce for the Arabs. It muſt not be imagined that the ſole motive of all the expences, riſks, and fatigues, incurred by the pilgrims, is devotion. Pecuniary intereſt has a conſiderable ſhare in theſe expeditions, and, indeed, permiſſion to trade, during the pilgrimage, is granted by the Koran, chap. ii. p. 23. The caravan affords the means of engroſſing every lucrative branch of commerce; and almoſt all the pilgrims convert it into a matter of ſpeculation. On leaving their own country, they load themſelves with merchandize, which they ſell on the road; the ſpecie ariſing from this, added to what they have brought with them, is conveyed to Mecca, where they exchange it for muſlins and Indian goods from Malabar and Bengal, the ſhawls of Caſhmire, the aloes of Tonquin, the diamonds of Golconda, the pearls of Bahrein, pepper, and a great quantity of coffee from Yemen. Sometimes the Arabs of the deſerts deceive the expectation of the merchant, by pillaging the ſtragglers, and carrying off detached parties of the caravan. Of the predatory ſpirit of the Arabs it is a ſingular proof, that although all their independent tribes are zealous Mahometans, yet they make no ſcruple of plundering the caravans of pilgrims, while engaged in performing one of the moſt indiſpenſable duties of their religion. A remarkable inſtance of this occurred in the year 1757; when 60,000 pilgrims were plundered and diſperſed over the deſert, a great number deſtroyed by ſword or famine, women reduced to ſlavery, immenſe riches loſt, and above all, a ſolemn act of religion ſacrilegiouſly violated. This produced a commotion in the empire, which was not ſoon forgotten. The plundering Arabs were the allies of Daher, who received them at Acre, and there permitted them to ſell their booty. The Porte, indeed, loaded him with the bittereſt reproaches, but he endeavoured to exculpate himſelf, and to appeaſe the Divan, by ſending the white banner of the prophet to Conſtantinople. In general, however, the pilgrims arrive ſafe; and in this caſe their profits are very conſiderable. At all events they are recompenſed in the veneration attached to the title of "Hadji," or "Hadgy," (pilgrim); and by the pleaſure of boaſting to their countrymen of the wonders of the Caaba (See CAABA) and mount Arafat; of magnifying the prodigious crouds of pilgrims, and the number of victims, on the day of the Bairam; and by recounting the dangers and fatigues they have undergone, the extraordinary figure of the Bedouins, the deſert without water, and the tomb of the prophet at Medina.

By means of this caravan, Damaſcus is become the centre of a very extenſive commerce. By Aleppo the merchants of this city correſpond with Armenia, Anatolia, the Diarbekir, and even with Perſia. They ſend caravans to Cairo, which, following a route, frequented in the time of the patriarchs, take their courſe by Djeſr-Yakoub, Tabaria, Nablous, and Gaza. In return they receive the merchandize of Conſtantinople and Europe, by way of Saide and Bairout. The home conſumption is balanced by ſilk and cotton ſtuffs, which are manufactured here in great quantities, and are very well made; by the dried fruits of their own growth, and ſweetmeat cakes of roſes, apricots and peaches, of which Turkey conſumes to the amount of about 40,000l. The remainder, paid for by the courſe of exchange, occaſions a conſiderable circulation of money in cuſtom-houſe duties, and the commiſſion of the merchants. This kind of commerce has exiſted in theſe countries from the earlieſt antiquity. It has flowed through different channels, according to the changes of the government, and other circumſtances; but it has every where left very apparent traces of the opulence produced by it. See Volney's Travels in Egypt and Syria, vol. ii. Ruſſell's Aleppo, vol. ii.

The caravan from Cairo in Egypt is compoſed, not only of pilgrims from every part of Egypt, but of thoſe that arrive from all the ſmall Mahometan ſtates on the African coaſt of the Mediterranean, from the empire of Morocco, and even from the negro kingdoms on the Atlantic. During the months of April, May, and June, in every year, theſe rich caravans from the interior of Africa arrive at Cairo; carrying thither a conſiderable quantity of three ſpecies of gums, elephants' teeth, tamarinds, parrots, oſtrich feathers, gold duſt, and black ſlaves; and in return they convey into their own country falſe pearls, coral, amber, glaſs-ware, broad ſwords, cloths, and all kinds of clothing, which are purpoſely made by the manufacturers of Cairo to ſuit the African taſte. When aſſembled, the caravan conſiſts at leaſt of 50,000 perſons, and the number of camels employed in carrying water, proviſions, and merchandize is ſtill greater. In the month of Ramadan, viz. one month previous to the departure of this caravan from Cairo, begins the fair, vulgarly called "Maûlâd (or, the birth of the prophet). Strangers of every nation and religion repair hither to diſpoſe of their merchandize. At this fair European merchandize is the moſt required; and of coin the ſequin of Venice is preferred. The pilgrims purchaſe them at the higheſt price, as it is the coin from which they derive the greateſt profit. The women are not leſs anxious to obtain them than the men, for the purpoſe of ornamenting the head and boſom. The journey, which, in going from Cairo, and returning hither, is not completed in leſs than 100 days, is performed wholly by land; and as the route lies moſtly through ſandy deſerts, and barren uninhabited wilds, which ſeldom afford any ſubſiſtence, and where often no ſources of water can be found, the pilgrims always undergo much fatigue, and ſometimes muſt endure incredible hardſhips. Of this caravan an early and good deſcription is publiſhed by Hakluyt, vol. ii. p. 202, &c. Maillet (Deſcript. de l'Egypt, part ii. p. 212, &c.) has entered into a curious and minute detail with regard to it: and Pocock (vol. i. pp. 188, 261, &c.) has given a route, together with the length of each day's march, which he received from a perſon who had been 14 times at Mecca. Upon the return of the caravan to Cairo, another fair begins, more ſumptuous and rich than that already mentioned; where ſtrangers barter for new commodities, and part with thoſe which they had not been able to ſell at the departure of the caravan. Thus the commerce of Cairo extends by land as far as Mecca in conſequence of this yearly pilgrimage, and alſo into the interior of Africa by the caravans of pilgrims.

Great as theſe caravans are, we muſt not ſuppoſe that all the pilgrims who viſit Mecca belong to them. Such conſiderable additions are received from the extenſive dominions of Perſia, from every province of Hindooſtan, and the countries to the eaſt of it, from Abyſſinia, from various ſtates on the ſouthern coaſt of Africa, and from all parts of Arabia, that when all are aſſembled, they have been computed to amount to two hundred thouſand. In ſome years the number is further increaſed by ſmall bands of pilgrims from ſeveral interior provinces of Africa, the names and ſituation of which are juſt beginning to be known in Europe. For this laſt fact we are indebted to the Aſſociation for promoting the diſcovery of the interior parts of Africa. In the report of the committee of the privy council on the ſlave trade, and alſo in Brown's Travels in Africa, (chap. 18.) other particulars are contained: and it appears that the commerce carried on by caravans in the interior parts of Africa, is not only widely extended, but of conſiderable value. Beſides the great caravan which proceeds to Cairo, and is joined by Mahomedan pilgrims from every part of Africa, there are caravans which have no object but commerce; which ſet out from Fez, Algiers, Tunis, Tripoli, and other ſtates on the ſea-coaſt, and penetrate far into the interior country. Some of them take no leſs than 50 days to reach their place of deſtination; and as the medium of their rate of travelling may be eſtimated at about 18 miles a day, the extent of their journey may be eaſily computed. As both the time of their outſet, and their route are known, they are met by the people of all the countries through which they travel, who trade with them. Indian goods of every kind form a conſiderable article in their traffic, in exchange for which the chief commodity they can give is ſlaves. Three diſtinct caravans are employed in bringing ſlaves, and other commodities, from the interior of Africa to Cairo. One of them comes ſtraight from Mourzouk, the capital of Fezzan; another from Sennaar, and the third from Fûr. They do not arrive at fixed periods, but after a greater or leſs interval, according to the ſucceſs they may have had in procuring ſlaves, and ſuch other articles as are ſuited to the market, the orders of their reſpective rulers, and various other accidental circumſtances. The Fezzan caravan is under the beſt regulations. The merchants from that country employ about 50 days in their paſſage from Mourzouk to Cairo; which city they as often as poſſible contrive to reach a little before the commencement of Ramadan, that ſuch as find themſelves inclined to perform the pilgrimage may be prepared to accompany the emir of Miſr. The ſale of their goods ſeldom employs them in the city much more than two months; after the expiration of which, thoſe who have no deſign of viſiting Mecca, return to their native country. The arrival of this caravan is generally annual. Thoſe who compoſe this caravan from Mourzouk to Cairo are collected from the empires of Bornou and Caſhna, from the extenſive kingdom of Caſſaba, and from ſeveral of the Negro ſtates. It ſeldom conſiſts of leſs than 100, or of more than 300 travellers; and begins its journey on the laſt week of October, or in the firſt of the ſucceeding month. At the cloſe of the ſeventh day it arrives at Temiſſa, and in two days more, at a lofty, rocky, uninhabited, and barren mountain, called Xanibba. Here they recruit their goatſkin bags with water from the only well which theſe heights afford, and then deſcend to a vaſt and dreary deſert, whoſe hilly ſurface, for four ſucceſſive days, preſents nothing to the eye but one continued extent of black and naked rock, to which, for three days more, the equally barren view of a ſoft and ſandy ſtone ſucceeds. On the eighth day they reach the vaſt mountain of Ziltan, the paſſage of which occupies four days of labour; and in the four ſucceeding days they croſs the ſultry plain that extends with its barren ſands from the foot of the mountain to the verdant heights of Sibbeel, and at the cloſe of the following day they arrive at the town of Augéla. From Augéla, which is ſubject to Tripoli, and famous for the abundance and excellent flavour of its dates, they proceed in one day to the village of Gui Xarrah, and another brings them to the long aſcent of the mountain of Gerdóbah. Deſcending from this height, where they procure, during five days of their paſſage over it, but a ſcanty ſupply of unpalatable water, they enter the narrow plain of Gegabib, which is ſandy and uninhabited, but fertile in dates, annually gathered by the people of Duna, a town dependent on Tripoli, and ſituate on the coaſt at the diſtance of eight days' journey from Gegabib. After a march of three days they are conducted to a deſolate mountain called Buſelema, that furniſhes only water; and in three days more they enter the dominions of the independent republic of See-wah. From See-wah, the capital, the caravan proceeds in a ſingle day to the miſerable village of Umſeguér, ſituate at the foot of the mountainous deſert of le Mágra, whence, after ſeven days, it arrives at the hill of Huaddy l'Ottrón, diſtinguiſhed by a ſmall convent of three Chriſtian monks, under the protection of Cairo. By theſe monks the travellers are hoſpitably entertained; and thence they continue their courſe, and on the fifth day reach the city of Cairo, from whence, at the proper ſeaſon, they purſue their route to Mecca.

The other two caravans from Sennaar and Fûr, are extremely various in their motions; ſometimes not appearing in Egypt for the ſpace of two or even three years, and ſometimes two or more diſtinct caravans arriving in the ſame year. The perpetual changes in their ſeveral governments, and the caprices of their deſpots, are in a great degree the occaſion of this irregularity. The road alſo between theſe two places and Cairo is often infeſted by bodies of independent Arabs, as that of Sennaar by the Ababdé and Shaikié, and that of Fûr by the Cubba-Beeſh and Bedaiât. The departure of a caravan from Dar-Fûr forms an important event: it engages the attention of the whole country for a time, and even ſerves as a kind of chronological epocha. The period of their arrival at Cairo is as uncertain as that of their departure; for they travel indifferently either in winter or ſummer. The journey from Aſſûan to Sennaar requires much leſs time than that from Aſſiût to Dar-Fûr. The roads of the deſert are not diſtinguiſhable by any permanent marks; and as they are perfectly ignorant of the compaſs, and ſo imperfectly acquainted with the fixed ſtars, they are often at a loſs for the road, and ſometimes deviate into dangerous paths. In paſſing from Dar-Fûr to Egypt, they conſider 2000 camels and 1000 ſlaves a large caravan. Camels are indiſpenſable for theſe long and fatiguing journeys, and therefore they are reared by the Arabs and Jelabs with great care: nevertheleſs, the merchant pays nearly as much for the camels to carry his merchandize as he did for the commodities themſelves. Horſes are little uſed by the Jelabs: they generally furniſh themſelves with Egyptian aſſes, which are afterwards ſold at Soûdan at an advanced price. The cuſtomary food of the drivers and ſervants of the caravan conſiſts of the milk of the camel, with a few dates, together with the meal of barley, or of Indian corn, which is ſometimes ſeaſoned with oil, to which the merchant ſuperadds, for his own uſe, the dried fleſh of the camel, or of ſheep, and concludes his repaſt with coffee. Water is drawn from the wells, when they occur, in leather buckets, that form a part of the travelling equipage of the caravan, and is carried in the ſkins of goats, through which, however, though tarred both within and without, it is often exhaled by the heat of the noon-day ſun. A very eaſy mode of conveyance is provided for the women and children, and for perſons either ill or infirm. Six or eight camels are yoked together in a row, and ſeveral tent poles are placed in parallel lines upon their backs: theſe are covered with carpets, and bags of corn are ſuperadded to bring the floor to a level, as well as to ſoften the harſhneſs of the camel's movement: other carpets are then ſpread, and the traveller ſits or lies down with as much convenience as if he reſted on a couch. The proviſions of the Dar-Fûr caravan are ſcanty and indifferent, nor are any of them furniſhed with dried meat as is common with the Fezzaners. Few uſe coffee and tobacco, and the reſt content themſelves with a leathern bag of flour, another of bread baked hard, a leathern veſſel of honey or treacle, and another of butter. In travelling from Dar-Fûr to Egypt, another article is much uſed, eſpecially for the ſlaves, which is the grain called millet. Of this they take a quantity after it has been coarſely ground, and cauſing it to undergo a ſlight fermentation, they make of it a paſte. When they uſe it they add water, and it becomes a tolerably palatable food, allaying thirſt whilſt it aſſuages hunger. Experienced travellers, among every ten camels laden with merchandize, charge one with beans, and ſtraw chopped ſmall, which, ſparingly given, ſerve them during the greater part of the journey. Water, inſtead of being conveyed in goat ſkins, the evaporation of which no ſkill can entirely prevent, is carried in ox hides, which the Jelabs, on their march from Soûdan to Egypt, form into capacious ſacks, and properly ſeaſon with tar or oil. A pair of theſe is a camel's load. The "Cabba-Beeſh" and the "Bedaiât," when they make any attempt on the caravans, commonly ſhew themſelves between Leghea and Bir-el-Malka. But this road is ſo ill provided with any kind of accommodation for man or beaſt, that neither the wandering tribes, nor the ferocious animals which infeſt other parts of the continent, are commonly found there. The Egyptians and other whites, therefore, though they commonly carry fire-arms with them from the North, generally take advantage of the market of Fûr, and return without any. The natives of Soûdan are furniſhed with a light ſpear, the head of which is made of unhardened iron of their country. They have alſo a ſhield about three feet long, and 1½, or ¾ foot broad, compoſed of the hide of the elephant, or hippopotamus, very ſimple in its conſtruction. No regular caravan of Hadgis leaves Dar-Fûr, but a number of the natives make their way to Mecca, either with the caravan of merchants trading to Egypt, or by way of Suakem or Jidda.

Upon the whole we may obſerve, that independently of thoſe caravans that are formed from religious motives, moſt of the inland commerce of the Eaſt has been for many ages carried on by means of caravans. In former times, caravans traverſed the whole latitude of Aſia in 243 days, from the Chineſe Ocean to the ſea-coaſt of Syria. Silk was immediately delivered to the Romans by the Perſian merchants, who frequented the fairs of Armenia and Niſibis; but this trade, which, in the intervals of truce, was oppreſſed by avarice and jealouſy, was totally interrupted by the long wars of the rival monarchies. However, the cities of Samarcand and Bokhara were advantageouſly ſituated for the exchange of the various productions of Aſia; and their merchants purchaſed from the Chineſe the raw or manufactured ſilk, which they tranſported into Perſia for the uſe of the Roman empire. In the vain capital of China, the Sogdian caravans were entertained as the ſuppliant embaſſies of tributary kingdoms; and if they returned in ſafety, the bold adventurer was rewarded with exorbitant gain. But the difficult and perilous march from Samarcand to the firſt town of Shenſi, could not be performed in leſs than 60, 80, or 100 days. As ſoon as they had paſſed the Jaxartes they entered the deſert; and the wandering hordes, unleſs they are reſtrained by armies and garriſons, have always conſidered the citizen and the traveller as the objects of lawful rapine. In order to eſcape the Tartar robbers, and the tyrants of Perſia, the ſilk caravans explored a more ſouthern road; they traverſed the mountains of Thibet, deſcended the ſtreams of the Ganges or the Indus, or expected with patience, in the ports of Guzerat and Malabar, the annual fleets of the Weſt. But the dangers of the deſert were found leſs intolerable than toil, hunger, and the loſs of time; and therefore the attempt was ſeldom renewed; and the only European who has paſſed that unfrequented way, applauds his own diligence, that in nine months after his departure from Pekin, he reached the mouth of the Indus.

The ſame intercourſe which was anciently kept up by the provinces in the north-eaſt of Aſia with Hindooſtan and China, ſtill ſubſiſts. Among all the numerous tribes of Tartars, the demand for the productions of theſe two countries is very conſiderable. In order to ſupply them, caravans ſet out annually from Bokhara, Samarcand, Thibet, and ſeveral other places, and return with large cargoes of Indian and Chineſe goods. But the trade carried on between Ruſſia and China, in this part of Aſia, is by far the moſt extenſive and beſt known. Some connexion of this kind has probably been kept up between them from the earlieſt period; but it greatly increaſed after the interior parts of Ruſſia were rendered more acceſſible by the conqueſts of Zenghis Khan, and Tamerlane. The commercial nations of Europe were ſo well acquainted with the mode of carrying on this trade, that ſoon after the Portugueſe had opened the communication with the Eaſt, by the Cape of Good Hope, an attempt was made, in order to diminiſh the advantages which they derived from this diſcovery, to prevail on the Ruſſians to convey Indian and Chineſe commodities through the whole extent of their empire, partly by land carriage and partly by means of navigable rivers, to ſome port on the Baltic, from which they might be diſtributed through every part of Europe. This ſcheme was rendered practicable by the conqueſts of Ivan Baſilowitz, and the genius of Peter the Great. Though the capitals of the two empires were ſituated at the immenſe diſtance of 6378 miles from each other, and the route lay for above 400 miles through an uninhabited deſert, caravans travelled from the one to the other. But though it had been ſtipulated, when this intercourſe was eſtabliſhed, that the number of perſons in each caravan ſhould not exceed 200, and though they were ſhut up within the walls of a caravanſera during the ſhort time they were ſuffered to remain in Pekin, and were allowed to deal only with a few merchants, to whom a monopoly of the trade with them had been granted; yet, notwithſtanding all theſe reſtraints and precautions, the jealous vigilance with which the Chineſe government excludes foreigners from a free intercourſe with its ſubjects was alarmed, and the admiſſion of the Ruſſian caravans into the empire was ſoon prohibited. After various negotiations, it was agreed, that two towns ſhould be built almoſt contiguous, on the boundaries of the two empires, Kiachta inhabited by Ruſſians, and Maimatſchin by the Chineſe. To theſe all the marketable productions of their reſpective countries are brought by the ſubjects of each empire; and the furs, the linen and woollen cloth, the leather, glaſs, &c. of Ruſſia, are exchanged for the ſilk, the cotton, the tea, the rice, the toys, &c. of China. See RUSSIA and CHINA.

M. Bougnon, geographer of the duke of Lorraine, has given a treatiſe of the caravans of merchants in Aſia, wherein he ſhews of what they are compoſed; how many ſorts there are; the ſeveral uſes of the different ſorts of animals in them; the price given for them; the officers and men appointed to conduct them, and the pay of each; with their manner of marching, halting, fighting, treating, &c.

In the heavy caravans, to five hundred elephants there are a thouſand dromedaries, and at leaſt two thouſand horſes, eſcorted by four thouſand cavaliers. Two men are required to lead each elephant; five to three dromedaries; and ſeven to twelve camels. Such a number of ſervants joined with the officers and paſſengers, the number whereof is not limited, renders the body very formidable; the paſſengers, indeed, are not obliged to fight, but in caſe they refuſe, proviſion will ſcarcely be allowed them afterwards, even for their money.

As few of the Arab princes have any other ſubſtance than what they can get by pillage, they keep continually ſpies on foot to give them intelligence of the departure and motions of caravans, which they frequently attack with ſuperior forces: in caſe of repulſe, they come to an accommodation; but if the caravan be beaten, it is abſolutely plundered, and the whole guard made ſlaves; though more indulgence is ſhewn to ſtrangers. The taking of a ſingle caravan ſometimes enriches a prince for ever.

The profits to be made in a caravan, during its march, are often incredible; Mr. Bougnon gives inſtances where, by repeated bargains and exchanges, a perſon has made twenty thouſand crowns out of a ſingle gold watch, and thirty louis d'ors.

Any dealer is at liberty to form a company, in order to make a caravan. He in whoſe name it is raiſed, is conſidered as the caravan-bachi, or chief of the caravan, unleſs he appoint ſome other in his place. If there be ſeveral merchants equally concerned, they elect a caravan-bachi; after which they appoint officers to conduct the caravan, and decide all controverſies which may ariſe during the journey.

In the Eaſt, days' journies are diſtinguiſhed into journies of horſe-caravans, and caravans of camels: thoſe of horſes are equal to two of camels. Mr. Rennell, in an ingenious diſſertation on the rate of travelling, as performed by camels, (Phil. Tranſ. vol. lxxxi. p. 129—145) of which ſome account has been given under the article CAMEL, has ſhewn how to apply the hourly rate of the camel's travelling in caravans as an uſeful ſcale to the geography of Africa; and it will alſo ſerve for the eſtimate of diſtances and of time, in other countries, where camels and caravans are in uſe. He diſtinguiſhes caravans into *heavy* and *light*. Camels loaded with from 500 to 600 pounds, which are a camel's load, form what is called the *heavy* caravan; and *light* caravans, on the contrary, are applied to camels under a moderate load, or perhaps little more than half-loaded. Having ſettled the mean daily rate of the heavy caravan at 18.64 Britiſh miles, reckoning $2\frac{1}{2}$ miles for each hour, and 19.06, if taken at 2.56, and the mean rate of the light caravan, 22.17 miles, at $2\frac{1}{2}$, and 22.7 at 2.56; he obſerves, that, in order to apply the ſcale with effect to the African geography, it is neceſſary to ſtate the number of days that the caravans uſually halt on the road. From various inquiries he concludes that, at an average, one halt muſt be allowed to $12\frac{1}{2}$ travelling days; and this, of courſe, muſt be deducted from the aggregate of the diſtance: or ſhould it be averaged on each day, the heavy caravan day muſt be reckoned at 17.14 miles inſtead of 18.64; and that of the light caravan 20.4, inſtead of 22.17, when the hourly rate is taken at $2\frac{1}{2}$ miles. It further remains to be ſtated from the proportion that the road diſtance bore to the direct diſtance, what length in direct diſtance, and in geographical miles, may be allowed for each day, for the heavy caravan, on lengths of journey, and over tracts of country ſimilar to the route of Mr. Carmichael from which the eſtimate is made. It appears that on the 28 days between Aleppo and Rackama (oppoſite Meſjid Ali) the mean length of the day's journey in direct diſtance is about 15¼ geographical miles; and on the whole 45 days between Aleppo and Buſſorah, 13.8 ſuch miles. If allowance be made for halts, theſe will require a deduction of 8 parts in 100 to be made from the groſs amount of the whole journey, when applied to the purpoſes of geography. Mr. Carmichael counted the camel's ſteps in order to aſcertain a ſcale of diſtance. Mr. Holford alſo did the ſame, and meaſured the length of them on the ground. The former gentleman counted the double ſteps, or rather the return of the ſame foot of a camel on which he rode, for an hour together on 20 different days, at ſuch times as admitted of the greateſt variation in the rate of motion. He found the greateſt number of ſteps to be 2420, the leaſt 2086; and the mean of the whole 20 hours was 2200. The latter gentleman reckoned the greateſt 2240, leaſt 2060; mean 2150. They both report the double ſtep to be 5½ feet. The reſult of the former account is 2.29 Britiſh miles per hour; of the latter 2.24: each allowed his diſtance accordingly in his journal. But Mr. Rennell obſerves, that their computed diſtances fall very ſhort of the truth. The error probably originated from their meaſuring too ſmall a number of ſteps on the ground as the foundation of their calculation. The reaſon of the great variation in the number of paces, in a given time, is the plenty or ſcarcity of the deſert ſhrubs, on which the camels feed as they go on; and then ſuch experiments become uſeleſs unleſs the quality of the deſert were deſcribed in every part of it.

Some have reckoned five ſorts of caravans, viz.

Caravan, *heavy*, compoſed of elephants, dromedaries, camels, and horſes.

Caravan, *light*, in which there are but few elephants.

Caravan, *ordinary*, that in which there are no elephants.

Caravan *of horſes*, that in which there are neither camels nor dromedaries, but only horſes.

Caravans, *ſea*, companies of merchant veſſels, loaden with goods, and convoyed by ſhips of war. Such are thoſe which paſs from Conſtantinople to Alexandria.

Caravan is alſo an appellation given to the voyages, or campaigns, which the knights of Malta are obliged to make at ſea againſt the Turks and corſairs, in order to arrive at the commanderies and dignities of the order. They are thus called, becauſe the knights have frequently ſeized the caravan going from Alexandria to Conſtantinople.

CARAVANIER, a perſon who leads the camels and other beaſts of burden uſed in the caravans of the Eaſt.

CARAVANSERA, a large public building, or inn, deſtined to receive and lodge the caravans.

The word comes from the Arabic *cairawan*, or Perſian *karwan* or *cârvân, a caravan*, and *ſerai, a large houſe*.

Of theſe caravanſeras, or as Chardin calls them, *caravanſerai*, there are a great number throughout the eaſt; erected out of the charity and magnificence of the princes, &c. of the ſeveral countries, for the accommodation of travellers. They are called by the Turks "Kanes;" and are ſituate ſometimes in the towns and villages; ſometimes at convenient diſtances upon the road.

Thoſe of Schiras and Caſbin in Perſia, are ſaid to have coſt ſixty thouſand crowns each. They are open to people of all religions and countries, without any queſtions aſked or any money required.

The caravanſerai are uſually huge ſquare buildings, with a ſpacious court in the middle of them. They are encompaſſed with galleries and arches, under which runs a kind of banquette, or elevation, ſome feet high, where travellers reſt themſelves, and make their lodgings as well as they can; their baggage and the beaſts that carry them being faſtened to the foot of the banquette. Over the gate, there is frequently a ſort of little chambers, which the caravanſeraſkier lets out at a very dear rate to ſuch as wiſh to be retired.

Though the caravanſeras ſerve in lieu of inns, yet there is this eſſential difference between them and our inns, that the traveller finds nothing at all in the caravanſera either for himſelf, or his cattle; but muſt carry all his proviſions and neceſſaries with him. They are chiefly built in dry barren deſert places; and are generally furniſhed with water from a great diſtance, and at a vaſt expence; there being no caravanſera without its well of water. There are ſeveral of them in cities; where they ſerve not only as inns, but as ſhops, warehouſes, and even exchanges.

There are ſome carayanſeras where moſt things may be had for money; and as the profits of theſe are conſiderable, the magiſtrates of the cities to whoſe juriſdiction they belong, take care to ſtore them well; they have an inſpector who fixes the price of lodging, without appeal. Such well-furniſhed reſting places appear to have been known in Judæa in the time of our Lord; ſince he ſuppoſes the good Samaritan committed the poor wounded man to the care of the hoſt, or keeper of the caravanſera, and promiſed at his return to pay him for whatever things the diſtreſſed traveller required, and which the keeper furniſhed him with. Luke x. 34, 35.

There are few cities in the eaſt without their caravanſerai; eſpecially within the dominions of the great Mogul. Thoſe of Conſtantinople, Iſpahan, and Agra, the capitals of theſe three empires, are diſtinguiſhed for their magnificence and commodiouſneſs. The caravanſeras of Schiras and Caſbin, conſiderable cities of Perſia, are alſo in high reputation, and little inferior to thoſe of the capital.

In Turkey, none but the grand ſignior's mother and ſiſter, with the viſiers and baſhaws who have been in three battles againſt Chriſtians, are allowed to build a caravanſera.

CARAVANSERASKIER, the director, ſteward, or intendant of a caravanſera.

At Iſpahan there are caravanſeras in manner of halls or exchanges, where goods are laid up, and expoſed to view; for which the caravanſeraſkier is accountable, in conſideration of a certain fee.

CARAVEL, the name of a veſſel formerly uſed by the Spaniards and Portugueſe; the maſts were inclined, in place of being upright as uſual, with triangular ſails. Veſſels of this deſcription ſailed faſt, and would lie near the wind.

Caravel is alſo the name of a ſmall veſſel employed on the coaſt of France in the herring fiſhery; and theſe are commonly from twenty-five to thirty tons burthen. French veſſels in the ſame employment in the Britiſh channel are called Trinquarts; theſe are in general from twelve to fifteen tons burden.

CARAVELLA, in *Zoology*, a ſpecies of Meduſa deſcribed in Sloane's Hiſtory of Jamaica. See Medusa *Caravella.*

CARAVI, in *Geography*, a ſmall iſland in the Grecian Archipelago. N. lat. 36° 55′. E. long. 23° 36′.

CARAVILLA, a town of Naples, in the country of Moliſe; 12 miles N.W. of Moliſe.

CARAUNA, in *Ichthyology*, the name of a ſmall Braſilian fiſh deſcribed by old writers as being of a fine bright red colour, with innumerable black ſpots all over it. The exact ſpecies is uncertain, but it appears to be a fiſh of the Labrus genus.

CARAUSIUS, in *Biography*, a native of Menapia or Maritime Flanders, who uſurped the empire in Britain in the third century. According to Dr. Stukely (Hiſt. of Carauſius) he was a native of St. David's, and a prince of the blood royal of Britain. Although ſprung from the meaneſt origin "viliſſimè natus," according to the expreſſion of Eutropius, he advanced himſelf by his naval ſkill, as a pilot, and by his experience and valour in maritime expeditions, to ſtations of truſt and ſervice, under Probus and his ſucceſſors. Having by the diſplay of his talents ingratiated himſelf with Maximian, this emperor employed him in conducting an enterpriſe againſt the Franks and Saxons, who by their piracies had rendered the navigation of the ſeas impracticable. With this view he was appointed to the command of a ſquadron, aſſembled at Geſſoriacum or Boulogne. Carauſius availed himſelf of the opportunity which this office of truſt afforded him for acquiring, by various captures of veſſels richly laden with ſpoil, ample treaſures; which he appropriated to his own uſe. Maximian, enraged by his treacherous and fraudulent conduct, determined to put him to death without trial. The crafty Carauſius foreſaw and prevented the ſeverity of the emperor. By his liberality he had attached to his intereſt the fleet which he commanded; and from the port of Boulogne he ſailed over to Britain; where, perſuading the legion, and the auxiliaries that guarded the iſland, to join his party, he boldly aſſumed the imperial purple, and the title of Auguſtus, and ſet at defiance the juſtice and the arms of his injured ſovereign. This event happened, during the joint empire of Diocleſian and Maximian, A. D. 286. In order to ſecure his uſurpation he augmented his fleet, attached to his cauſe by a variety of artful methods the Franks and Saxons, and whilſt he defended the frontiers of his dominions againſt the Caledonians of the North, invited from the continent a great number of ſkilful artiſts, and diſplayed, in various coins which are ſtill extant, his taſte and opulence. He ſtill preſerved the poſſeſſion of Boulogne and the adjacent country. His fleets rode triumphant in the channel, commanded the mouths of the Seine and of the Rhine, ravaged the coaſts of the ocean, and diffuſed beyond the columns of Hercules the terror of his name. Under his command, Britain deſtined in a future age to obtain the empire of the ſea, already aſſumed its natural and reſpectable ſtation of a maritime power. As he had ſeized the fleet of Boulogne, he had deprived his maſter of the means of purſuit and revenge. After a diſappointed effort by a new armament, conſiſting of imperial troops unaccuſtomed to the ſea, Diocleſian and his colleague reſigned to Carauſius the ſovereignty of Britain, and reluctantly admitted their perfidious ſervant to a participation of the imperial honours. His civil government, whilſt it laſted, was oppreſſive and tyrannical. He held the people in a ſtate of perfect ſubjugation, and at the ſame time indulged his own paſſions and thoſe of his mercenaries, upon whom he depended for ſupport, without reſtraint and limitation. At length, however, the aſſociation of the two Cæſars reſtored new vigour to the Roman arms; and the conduct of the Britiſh war was committed to the brave Conſtantius. His firſt enterpriſe was directed againſt Boulogne, which after an obſtinate defence ſurrendered, A. D. 292; and thus a conſiderable part of the naval ſtrength of Carauſius fell into the hands of the beſiegers. During the three years which Conſtantius employed in preparing a fleet adequate to the conqueſt of Britain, he ſcoured the coaſt of Gaul, invaded the country of the Franks, and deprived the uſurper of the aſſiſtance of theſe powerful allies. Before theſe preparations were finiſhed, Conſtantius received information of the death of the tyrant, who was murdered, A. D. 294 (ſays Gibbon) or A D. 293 (Blair's Tables) by his firſt miniſter Allectus. See Allectus. Crevier's Rom, Emp. vol. ix. Gibbon's Hiſt. vol. ii.

CARAWAWANG *Point*, in *Geography*, the eaſt point of the bay of Batavia in the iſland of Java.

CARAWAY, in *Botany*. See Carus *carui*.

Caraway, in *Agriculture*, a plant ſometimes cultivated for the ſeed. It is a ſort of crop much cultivated in Eſſex on rich old leys of a ſtrong clayey or loamy nature, in low ſituations. It is ſometimes ſowed with coriander and teaſel, and harveſted the ſecond year at the expence of four ſhillings an acre. It is commonly threſhed upon a cloth in the field, being very apt to fall in gathering, which is done the beginning of July. It commonly requires two good hoeings; one in April, the other in the beginning of June. The produce of this crop has often been very great, even as much as twenty hundred weight per acre, which has always a market in London; but ſometimes as low as 12s. and frequently as high as 50s. on an average, 24s. or 26s. per hundred weight. It does not perfect its ſeed till the ſecond or third year, when the land is fit to be ploughed up for wheat. For this crop the land ſhould be prepared by two or more ploughings, and have a portion of manure applied where poor. See Carus.

CARAXERON, in *Botany*. Vaill. act. 1722. p. 264. See Illecebrum *vermiculatum*.

CARAZOWINY, in *Geography*, a river on the eaſt coaſt of South America, between the river Cauroya to the E.S.E. and Uracho to the W.N.W. It large and navigable; but viſited chiefly by a few Dutch ſhips, who come hither to load a kind of dyers' wood.

CARBACA, or Garbaca, in *Ancient Geography*, a town of Aſia, in Paropamiſus. Ptolemy.

CARBANA, a town of Aſia Minor, in Lycia. Steph. Byz.

CARBANIA, a ſmall iſland of the Mediterranean, between Sardinia and the continent of Italy. Pomp. Mela. Some have thought that it is the *Barpana* of Pliny, and the modern *Carboli*.

CARBANTORIGUM, a town in the northern part of Britain, which, according to Ptolemy, belonged to the Selgovæ. Horſley places it at Bardanna on the river Nith, above Dumfries, and Camden at Carlaverock, below it; and it was therefore probably ſituated where Dumfries now ſtands, or a little below it. The name ſeems to be derived from "Caer vant o rig," a town near the mouth of a river. Baxter places it at Melroſs.

CARBASA *Caryſtia*, a term uſed by many of the ancient writers to expreſs pieces of cloth made of the *linum incombuſtibile*, or aſbeſtos ſtone, which being found plentifully about Caryſtium, was thence called by the name of the place. Pauſanias calls it *linum Carpaſum*, for the ſame ſort of reaſon; Carpaſus, a town in the iſland of Cyprus, being a place famous for affording large quantities of the ſtone in its neighbourhood.

CARBATIA, in *Ancient Geography*, a place of Italy in Liguria, at a ſmall diſtance ſouth of the Padus, or Po.

CARBENSIS *aqua*, in the *Materia Medica*, the name of a mineral water of Germany, of which Hoffman from Petzelerus has given the following account. All about the place of its origin, and along the canals through which it paſſes, it depoſits an earthy and ferruginous matter, which concretes into a ſtony hardneſs. When any alkaline liquor, whether fixed or volatile, is added to theſe waters, they become turbid, and precipitate a whitiſh earthy matter to the bottom of the veſſel; after the evaporation of the water they leave a *ſal enixum*, and an alkaline earth; two quarts of them yield two ſcruples and ten grains of the earth, and twelve grains of the ſalt. If it be kept for any time in a glaſs, or earthen veſſel, it depoſits a ſediment of a yellow ochreous earthy matter, and when immediately taken from the ſpring, it changes to a bluiſh brown colour, on being mixed with galls. It contains a very large portion of a ſubtile mineral ſpirit; for if a long-necked veſſel be filled half full with it, and the orifice ſtopped with the thumb, the whole, on a little ſhaking, ſends up a froth to the top; and when the thumb is taken off, the water ſquirts out to ſeveral feet diſtance. It makes an effervesſcence on mixing oil of vitriol with it; but this laſts but a very little time. From the whole, it ſeems to contain a large quantity of calcareous earth, and ſome ſmall portion of ferruginous matter; whence it purges both by ſtool and urine, though moſtly the latter way: the former operation, which is pretty conſtant, is owing to this alkaline earth meeting with an acid in the *primæ viæ*, and being by it changed into a bitter purging ſalt, of the nature of Glauber's.

CARBEQUI, or *Aſper of copper*, a coin which is current in the province of Georgia in Aſia; particularly at Tefflis, the capital. Forty carbequis are equal to the "abagi," and ten carbequis to the "chaouri."

CARBERRY, in *Agriculture*, a name applied, in ſome places, to the gooſeberry.

CARBERY, in *Geography*, the name of a large barony in the S.W. of the county of Cork, province of Munſter, Ireland. The diſtrict of this name formerly included ſome of the adjoining baronies, and is ſuppoſed to have been ſo called from an Iriſh prince who governed it. It is ſtill the largeſt barony in Ireland, containing 39 pariſhes, and 196,321 Iriſh plantation acres, which is more than many counties. It has, therefore, been found convenient, in managing county buſineſs, to divide it into Eaſt and Weſt Carbery. It is a very wild, mountainous, unimproved country, with a bold rocky coaſt, and many harbours.

A Latin poem of dean Swift's, called "Carberiæ rupes," was written in 1723, whilſt on a viſit to a clergyman in this barony. Dr. Smith, who made more than once the ſame little voyage along the coaſt which the dean had done, obſerves that the dean's deſcriptions were as juſt as his numbers were beautiful. The poem, and a tranſlation of it by Dr. Dunkin, may both be ſeen in Smith's Hiſtory of Cork, from which this article is principally taken. In ſome parts of Carbery the linen manufacture is ſucceſsfully carried on, eſpecially about Dunmanway and Cloghnakilty. Carbery, or Carbury, is alſo the name of two other baronies, one in the county of Sligo, and the other in the county of Kildare.

Carbery, a ſmall iſland in Dunmanus bay, county of Cork, Ireland, which ſhelters veſſels from weſterly winds, but has ſhoals in its neighbourhood, which require attention to guard againſt. It is ſometimes called *Innis Carbery*. N. lat. 51° 31′. W. long. 9° 34′. M'Kenzie, Beaufort.

CARBET St. Jaques, a town of Martinico, in the Weſt Indies. N. lat. 14° 39′. W. long. 61° 10′.

CARBI, in *Ancient Geography*, a people of Arabia Felix, according to Diodorus Siculus.

CARBIA, a place in the iſland of Sardinia, on the route from Tibulæ to Sulci. Anton. Itin.

CARBINA, a place of Italy in Japygia, mentioned by Athenæus, who ſays that it was taken by the Tarentins.

CARBINI, in *Geography*, a town of the department of Liamone, (iſland of Corſica), and chief place of a canton in the diſtrict of Sartene; 5 miles E. of Tallano. The canton contains 2806 inhabitants.

CARBO *aquaticus*, in *Ornithology*. See Pelecanus *Carbo*, the Corvorant.

CARBON, in *Chemiſtry*.

### § 1. *Of Carbon.*

This ſubſtance abounds largely in all vegetable and animal bodies, as well as in the mineral kingdom, yet it is of very rare occurrence in a ſtate of abſolute purity. When uncombined with any foreign matter, it is tranſparent, colourleſs, intenſely hard, and cryſtallized; and, both on account of its beauty and value, is placed at the head of the gems under its commercial and mineralogical name Diamond.

Diamond was formerly ſuppoſed to be incombuſtible, and the firſt hint at its real nature was given by Newton. This philoſopher having obſerved that inflammable bodies poſſeſs, in proportion to their denſity, a greater power of refracting the rays of light than any other ſubſtances, was induced to rank the diamond among them, on account of the eminent degree in which it poſſeſſed this property. This conjecture was verified, in 1691, by the members of the Academy del Cimento at Florence, who conſumed ſeveral diamonds by placing them in the focus of a lens. Francis I. emperor of Germany, afterwards witneſſed the deſtruction of ſeveral more by the heat of a furnace. Theſe experiments were repeated by Macquer, Rouelle, Darcet, and Cadet, who aſcertained, that by the concurring action of air and heat, diamond was not only evaporated, but actually burnt with flame; they alſo proved that when the air was excluded the higheſt heat of a furnace produced little or no effect on this ſubſtance.

In 1772, an experiment was made by Lavoiſier, which may be conſidered as the firſt attempt to effect a chemical analyſis of diamond. He burnt a few grains of this ſubſtance in a jar of common air, confined over mercury, by means of a very powerful lens, and found that the pure part of the air had diſappeared, as well as a conſiderable proportion of the diamond, and that the reſidual air abounded with carbonic acid: repeating the ſame proceſs only with the ſubſtitution of an equal weight of highly burnt charcoal, he found preciſely analogous effects to take place, and therefore concluded that diamond and charcoal in their chemical eſſence were very ſimilar to each other. In 1785, M. Morveau diſcovered that diamond, when dropped into melted nitre, burns like charcoal, and without leaving any reſiduum. This fact ſuggeſted to Mr. Tennant a method of analyſing diamond, which was effected with complete ſucceſs. Into a gold tube, cloſed at one end, and terminating at the other in a curved glaſs tube, were put a quarter of an ounce of nitre and 2½ grains of diamonds; the tube was then kept at a full red heat for an hour and a half, and when its contents were afterwards examined, the diamonds were found to have entirely diſappeared, and the nitre was changed into ſub-carbonat of potaſh; to a ſolution of this ſalt muriat of lime was added, and thus the carbonic acid was transferred to the lime: from this carbonat of lime the carbonic acid was expelled by means of the muriatic acid, and was found to amount to 9.03 grains. Hence 27.6 parts of diamond and 72.4 of oxygen conſtitute 100 of carbonic acid. But, according to Lavoiſier, 28 parts of charcoal, and 72 of oxygen conſtitute 100 of carbonic acid; therefore diamond and pure charcoal may be conſidered as chemically the ſame.

Morveau has ſince endeavoured to invalidate the experiment of Mr. Tennant, and to ſhew that diamond is pure carbon and that charcoal is an oxyd of carbon, but his experiment is ſo manifeſtly incorrect as to merit no ſort of confidence.

A further proof of the analogy between charcoal and diamond is furniſhed by an ingenious experiment of Clouet's, in which ſome pure bar-iron being expoſed to a high heat, in contact with diamond, this latter ſubſtance was found to have diſappeared, and the iron to be converted into ſteel.

But though diamond is the pureſt form of carbon, yet its high value, its hardneſs, and denſity, forbid it to be uſed in ordinary chemical experiments; all the ſucceeding facts, therefore, relate to that leſs pure kind of carbon which is obtained by expoſing common CHARCOAL, or, ſtill better, lamp-black, to a high heat in cloſe veſſels.

Carbon, or prepared charcoal, is an excellent conductor of galvaniſm and electricity, but tranſmits caloric with very great difficulty; a ſhort piece may be held by one end while it is heated red at the other, without conveying any notable warmth to the hand.

It is inſoluble in water, and even the combined action of air and water produces hardly any perceptible effect upon it; hence it is that ſtakes of wood that are charred on the outſide will laſt much longer without rotting than the ſoundeſt timber that has not undergone this preparation.

Charcoal is not fuſible by the greateſt heat that can be applied: if expoſed to a very high temperature in cloſe veſſels it loſes little or nothing of its weight, but ſhrinks in ſize, and becomes proportionably more compact, denſe, and ſonorous, and acquires a deep velvet black colour. But though charcoal is unalterable by mere heat, yet when heated red in the open air, it ſpeedily undergoes combuſtion, and is converted into CARBONIC ACID; pure oxygen gas produces, as might be expected, a much more powerful effect on this ſubſtance than atmoſpheric air does; a piece of charcoal barely heated at one end to redneſs and plunged into this gas, immediately burns with an intenſely white glow, and is rapidly changed into carbonic acid.

Water, although it is, as we have already mentioned, incapable of diſſolving carbon, is yet very obſtinately retained by it, partly on account of its porous texture, and in part probably on account of a ſtrong mutual affinity ſubſiſting between them. When, however, charcoal is red hot, or nearly ſo, it decompoſes any water with which it may happen to be in contact, and unites with both the elements of this ſubſtance; producing with the oxygenous baſe, according as this is added to ſaturation or not, carbonic acid and carbonous oxyd; and with the hydrogenous baſe forming a heavy inflammable air, called carburetted hydrogen or hydrocarbonat.

Newly prepared charcoal is capable of abſorbing various gaſſes, with remarkable facility, and in conſiderable proportions. This fact had been obſerved by Fontana, Lametherie, Prieſtley, Scheele, and Morveau, but the firſt important ſeries of experiments on this ſubject was publiſhed by Morozzo, ſince which time Meſſrs. Rouppe and Van Noorden of Rotterdam have made a conſiderable and very valuable addition of facts on this curious ſubject. The charcoal for the experiment being highly ignited in an open fire, to expel all the moiſture and gaſeous ſubſtances which it may contain, is quickly removed, and extinguiſhed by being plunged under mercury, or incloſed in an air-tight metallic box; when quite cool it produces the following effect on the various gaſſes.

One part of charcoal is capable of abſorbing three times its bulk of atmoſpheric air in four or five hours; of oxygen gas there is abſorbed, at firſt rapidly, and afterwards more ſlowly, 2.8 times the bulk of the charcoal. Azot and hydrogen are taken up inſtantaneouſly, but only in the proportion of 1.6 of the former, and 1.8 of the latter. Of nitrous gas 8.5 parts are very ſlowly, and of carbonic acid 14.3 parts are very rapidly abſorbed. The gaſſes thus taken up undergo no change except of form, nor are the reſidues at all altered, and they may be all again ſeparated from the charcoal by diſtillation, at the temperature of boiling water. If charcoal ſaturated with hydrogen in the way deſcribed is introduced into oxygen gas, or even into atmoſpheric air, a conſiderable abſorption of the oxygen takes place, and combines with the hydrogen, forming water, and at the ſame time the temperature riſes to about 103° Fahr. The reſult is the ſame if the experiment is inverted, that is, if charcoal charged with oxygen is introduced into hydrogen gas. Charcoal ſaturated with hydrogen is even capable of decompoſing nitrous gas, the oxygen being abſorbed and the azot alone remaining in the elaſtic ſtate. Charcoal ſaturated with azot is alſo capable of decompoſing atmoſpherical air, by abſtracting the oxygenous part, which is a remarkable proof how adverſe the gaſeous ſtate is to chemical combination.

Carbon is capable of combining with ſulphur; the ſubſtance hence reſulting is called carburetted ſulphur, and almoſt all that is known as yet concerning it is due to the united inveſtigations of Clement and Deſormes, two French chemiſts. It is thus prepared. Fill an earthenware tube with ſmall pieces and powder of newly burnt charcoal, fix it in a ſlanting direction in a furnace, and lute to the lower end a glaſs tube, dipping it into ſome water contained in a receiver. Faſten a glaſs tube alſo to the upper extremity of the earthen pipe, and fill it with ſhort cylindrical pieces of ſulphur, and fit a cork to the open end of the glaſs tube with a moveable wire paſſing through its centre, by which the pieces of ſulphur may be puſhed at pleaſure towards the earthen pipe. The apparatus being completed, heat the pipe very gradually, and as ſoon as the gas caſually contained in the charcoal is driven out, cauſe the ſulphur, by means of the wire, to approach the heated part of the apparatus. Allow it to remain at ſuch a diſtance that it may melt as ſlowly as poſſible, and run down among the charcoal; and if theſe precautions are duly obſerved, a yellowiſh oily liquor will ſoon be perceived in the terminating glaſs tube, which will drop into the water of the receiver, and collect at the bottom of the veſſel, without at all uniting with the ſupernatant fluid. The carburet of ſulphur thus obtained is a tranſparent liquid, colourleſs when pure, but generally of a yellowiſh-green tinge, and of a diſagreeable ſlightly pungent odour, differing, entirely, however, from that of ſulphuretted hydrogen. The ſpecific gravity of carburetted ſulphur is about 1.3. It evaporates in the air with nearly the ſame rapidity as ether, and, like this fluid, ſinks the thermometer during the proceſs in a remarkable degree. If it is put into an air-pump, and the atmoſpherical preſſure be reduced to about nine inches of mercury, the carburetted ſulphur begins to aſſume the form of a gas; but upon reſtoring the common preſſure, this gas will immediately again reſume its liquid ſtate. It takes fire upon the application of a flame, and burns like alcohol, giving out at the ſame time a ſulphureous odour, and depoſiting both ſulphur and carbon. When kept for ſome time in a vial with atmoſpheric or azotic gaſſes, it is diſſolved by them in ſmall proportion, and renders them inflammable. It combines with nitrous gas, and the mixture burns like zinc. When diſſolved in oxygen gas, the reſult is an air that explodes with ſuch prodigious violence as to render it dangerous to ſet fire to even a few ounce meaſures at the ſame time. In the ſtate of vapour it combines ſlowly with the cauſtic fixed alkalis, forming with them deep amber-coloured ſolutions. By alcohol it is reduced to a ſoft paſty conſiſtence. It diſſolves very eaſily in cold olive oil, or in ether, depoſits a little charcoal, and then aſſumes a cryſtalline form.

Carbon is ſaid by Prouſt to be capable of uniting with phoſphorus, but this, from ſubſequent experiments, appears to be a miſtake.

Two of the metals are known to unite with charcoal; when combined with Iron the product is called ſteel; and with Copper it forms a peculiar ſubſtance, firſt noticed by Dr. Prieſtley, and named by him charcoal of copper.

The action of the alkalies upon charcoal has been but little examined into; it is certain, however, that cauſtic potaſh, by long digeſtion with this ſubſtance, becomes coloured and partly carbonated.

The undecompoſable acids appear to have no action on charcoal, but the decompoſable ones are deprived by it of their oxygen, either entirely or in part, and the charcoal is changed into carbonic acid; thus phoſphoric acid and charcoal yield, by ignition, phoſphorus and carbonic acid; ſulphuric acid and charcoal yield ſulphur, ſulphureous acid, and carbonic acid. If highly dried and finely pulveriſed charcoal is poured into recently prepared oxymuriatic acid gas; as ſoon as the two ſubſtances come into contact the charcoal becomes red hot, and falls to the bottom of the veſſel, like a ſhower of fire.

The neutral and earthy ſalts with decompoſable acids are remarkably changed at a red heat by charcoal: the others ſuffer no perceptible alteration. Thus the ſulphats are converted into ſulphurets, the nitrats become carbonats, while the muriats and fluats remain unchanged.

The metallic ſalts are all of them decompoſed by charcoal at a greater or leſs degree of heat, in conſequence of the deoxygenation of their baſes, independently of the action of this ſubſtance on their acids.

The effects of charcoal in clarification are both curious and important. They were firſt noticed by M. Lowitz of Peterſburg, and have for the moſt part been amply confirmed by ſucceeding obſervers, although the preciſe cauſe of theſe remarkable changes has not been ſatisfactorily aſcertained. All that is eſſential for this purpoſe is, that the charcoal ſhould be in fine powder and very dry; hence the only preparation requiſite is to pulverize ſome well burnt common charcoal, and then heat it in a covered crucible to a glowing red, till it ceaſes to give out an inflammable vapour. If it is not employed immediately, it ought to be kept in a ground ſtoppered glaſs bottle, and may then be preſerved unimpaired for any length of time. The effects of this prepared charcoal are very ſtriking. Being mixed with common vinegar, or any kind of wine, a thick froth riſes to the ſurface, and the liquors, after filtration, are found to be as limpid as water. The filthieſt and moſt putrid ditch-water is in like manner rendered perfectly clear, inodorous and inſipid; and rancid oils are alſo deprived of their ſmell and taſte by repeated filtration through this prepared charcoal. Hence alſo its peculiar efficacy as a dentrifice; it is ſufficiently hard to remove the concretions from the teeth without injuring the enamel, while it neutralizes and entirely deſtroys for a time any fœtor which may ariſe from a carious tooth.

### § 2. *Of carbonous oxyd, or gaſſeous oxyd of carbon.*

Dr. Prieſtley was the firſt perſon who effectually called the attention of chemiſts to this ſubſtance; but for a correct acquaintance with its nature and properties we are indebted to Mr. Cruickſhank. It had always been objected by Dr. Prieſtley, againſt Lavoiſier's hypotheſis of the conſtitution of fixed air, that when charcoal, however dry, was diſtilled with ſcales of iron, or the red oxyd of mercury, the product was not only carbonic acid, but a large quantity of a heavy, inflammable air, reſembling, in many reſpects, carburetted hydrogen, and ſuppoſed by Dr. Prieſtley to be actually this very gas. Now carburetted hydrogen conſiſts of hydrogen, holding carbon in ſolution; and if it were really produced by the mutual action of carbon and a metallic oxyd, could only be accounted for upon the Lavoiſerian theory by the caſual preſence of ſome water. But the gas is produced in ſuch great abundance, even when the materials have ſeparately been firſt expoſed to a very high heat to drive off every atom of water, that this hypotheſis is untenable; it is, therefore, an obligation of no trifling kind that the modern chemical theory is under to Mr. Cruickſhank, for having ſhewn that this gas, though inflammable, does not neceſſarily contain any hydrogen whatever, but has only a ſimple combuſtible baſe, namely, carbon, and differs from carbonic acid merely by its ſmaller proportion of oxygen. Hence, it is properly called an oxyd of carbon, and bears the ſame analogy to carbonic acid as the nitrous oxyd does to the nitric acid. The experiments of Mr. Cruickſhank have been repeated with much apparent accuracy by Meſſrs. Clement and Deſormes, and the reſults obtained by them correſpond very nearly with thoſe of the former chemiſt.

The gaſſeous oxyd of carbon may be produced either by the partial oxygenation of carbon, or the partial deoxygenation of carbonic acid, or the ſolution of carbon in carbonic acid, on each of which methods we ſhall proceed to ſay a few words.

The original experiment by Dr. Prieſtley is the following. Equal parts of ſcales of iron and charcoal (each having previouſly been ignited in ſeparate veſſels), were put into a glazed earthen retort and ſtrongly heated. In a ſhort time a prodigious quantity of air came over, which, on examination, was found to conſiſt of one tenth carbonic acid, and the remainder was "an inflammable air of a very remarkable "kind, being quite as heavy as common air. The reaſon "of this," Dr. Prieſtley adds, "was very apparent, when "it was decompoſed by dephlogiſticated air, for the greater "part of it was fixed air." The above two important properties, namely, the weight of this gas and its almoſt total convertibility into carbonic acid by oxygen, are fully confirmed by ſubſequent experiments.

Mr. Cruickſhank, in repeating this experiment of Dr. Prieſtley, found, that as ſoon as the retort was red, abundance of gas came over, which, being examined at different periods, was found, in the beginning of the proceſs, to be compoſed of one part of carbonic acid and four of carbonous oxyd, with a ſmall admixture of carburetted hydrogen; after this, to the end of the proceſs, the proportion of carbonous oxyd gradually increaſed to about ſix-ſevenths of the whole. Two ounces of the materials afforded many gallons of the gas.

The ſublimed oxyd of zinc was next ſubſtituted to the iron ſcales, and diſtilled in the ſame manner with charcoal. Even before the retort became red much gas was given out, and, on increaſing the heat, it came over in torrents. It contained a much ſmaller proportion of carbonic acid than the former, and, towards the end, conſiſted of pure oxyd of carbon. Part of the zinc was found, in the metallic ſtate, ſublimed into the neck of the retort. In like manner litharge, the grey oxyd of manganeſe, and the red oxyd of copper, produced with charcoal, firſt, a mixture of carbonic acid with carbonous oxyd, and, at laſt, the inflammable gas in a ſtate of purity.

The diſtillation of charcoal and the ſublimed oxyd of zinc was repeated by Clement and Deſormes, with particular attention to the quantity of products from a given weight of materials. The charcoal and zinc were firſt heated ſeparately, and examined. Common charcoal, when heated ſtrongly, gave a conſiderable quantity of inflammable gas, and about $\frac{1}{20}$th of its weight of water. After an hour nothing further came over; ſo that, to enſure the purity of the charcoal, it ſhould be uſed hot from the crucible or other veſſel in which it has been expoſed to a full red heat for half an hour. The oxyd of zinc gave out nothing at all by being heated *per ſe*; ſo that it may at any time be conſidered as pure, when previouſly free from accidental moiſture.

It was found, by experiment, that 14.36 parts of zinc increaſed, by calcination, to 17.48 of white ſublimed oxyd; and hence it is inferred that 100 parts of white oxyd conſiſt of 82.15 metal, and 17.85 oxygen. Pure charcoal, prepared as above, was mixed, to the amount of 30 grammes, (463 grains) with an equal weight of oxyd of zinc, which were put into a coated glaſs retort, communicating with lime-water, through which all the gaſeous products paſſed. When firſt heated, a ſmall portion of carbonic acid gas appeared, rendering the lime-water turbid; but this ſoon ceaſed, and the gas was purely inflammable. In five hours the production of gas had entirely terminated, and the total products of the operation were as follows:

| | Grammes. |
|---|---|
| Zinc ſublimed in the retort - - - | 21.82 |
| Charcoal remaining - - - - | 26.60 |
| Carbonic acid - - - - - | 0.07 |
| Nine litres (16.9 wine pints) of inflammable gas | 10.35 |
| | 58.84 |
| Loſs - | 1.16 |
| | 60.00 |

In all the preceding experiments the carbonous oxyd was obtained by the partial deoxygenation of the metallic oxyds and the conſequent oxygenation of the carbon. In thoſe which we are about to relate, the ſame gas was procured by inverting the proceſs, that is, by depriving carbonic acid of a portion of its oxygen.

Dr. Prieſtley, having obtained an inflammable gas, by heating together carbonat of barytes and magnetic oxyd of iron, Mr. Cruickſhank was induced to vary the experiment in the following manner. Equal parts of chalk (heated red hot previouſly for ten minutes), and of iron filings were mixed together, and heated in an earthen retort, abundance of gas was given out, conſiſting pretty uniformly of one part carbonic acid and five of carbonous oxyd.

An ounce of chalk previouſly heated red for ten minutes, was mixed with an equal weight of zinc filings, and heated gradually in a coated glaſs retort. A little carbonic acid came over at firſt, but mixed with oxyd of carbon; and when the contents of the retort were thoroughly red, nothing but the inflammable gas came over, and that in prodigious quantity. It was examined at different periods of the diſtillation, and proved to be wholly unmixed with carbonic acid. After the proceſs, the retort being examined, there was found ſome ſublimed oxyd of zinc in its neck, below which was ſome metallic zinc, and at the bottom was a mixture of oxyd of zinc, and partly cauſtic lime. Chalk, with tin filings, gave a ſimilar reſult.

In theſe experiments, the carbonic acid was united to an earthy baſe before diſtillation, and conſequently was expoſed to the deoxydating effect of the metallic filings in its naſcent ſtate, or, at the moment of its aſſuming the gaſeous form, a ſtate in which airs of all kinds are peculiarly ſuſceptible of chemical change. Mr. Cruickſhank found, however, that carbonic acid, even in the elaſtic ſtate, was alſo ſuſceptible of being deoxydated by the ſame means, though not quite ſo eaſily. For this purpoſe, ſome dry chalk was introduced into an iron retort, over which was rammed ſome dry ſand, and a ſtratum of iron-filings over all. In this arrangement, the carbonic acid gas expelled from the chalk had to traverſe a ſtratum of ſand three inches thick, before it could reach the iron-filings. The gaſeous products of the diſtillation were a quantity of undecompoſed carbonic acid, together with a large proportion of the inflammable gas, and the iron filings were taken out conſiderably oxydated. The decompoſition of carbonic acid by metals does therefore take place, when the acid is in the gaſeous form, but by no means ſo perfectly as when in its naſcent ſtate. A ſimilar decompoſition was alſo effected by forcing the ſame carbonic acid gas ſucceſſively backwards and forwards through an iron tube, the middle of which was full of iron-filings, and kept red hot by a ſmall furnace placed beneath it. A bladder was tied to each end of the tube to receive the gas, and, by paſſing it twenty times ſlowly through the tube, two thirds of it were converted into inflammable gas.

It is obvious, that if to any baſe, already united with oxygen, we add a freſh portion of the baſe, it will have the ſame relative effect as abſtracting part of the oxygen; and this offers another mode of preparing carbonous oxyd, which has been ſucceſsfully practiſed by Meſſrs. Clement and Deſormes. Pelletier had previouſly diſcovered that though the native carbonat of barytes is ſcarcely calcinable, *per ſe*, in any fire, yet it will readily part with its acid by calcination, if previouſly ground to fine powder, and mixed with a little charcoal. The chemiſts above-mentioned, on repeating this experiment with three parts of carbonated barytes and one of charcoal, obtained a large quantity of gas, compoſed of about $\frac{5}{6}$ carbonous oxyd, and $\frac{1}{6}$ carbonic acid, and the barytes remaining in the retort was found to be quite cauſtic. Here, therefore, it is to be ſuppoſed, that the carbonic acid is ſuperſaturated with its own baſe, and thus rendered much more volatile than before.

A more direct combination of carbon with carbonic acid was alſo obtained by the two aſſociated chemiſts juſt mentioned, with preciſely the ſame apparatus as that uſed by Mr. Cruickſhank for paſſing carbonic acid gas over red hot iron, except that the tube was filled with pulverized charcoal inſtead of iron-filings. The firſt ſenſible effect produced on the gas was a conſiderable dilatation, excluſive of the mere expanſion by heat, and ariſing from the ſolution of a part of the heated charcoal in the gas as it paſſed over. After each experiment, by far the greater part of the carbonic acid was changed into the inflammable gaſeous oxyd of carbon, the reſidual carbonic acid not amounting to more than from $\frac{1}{10}$th to $\frac{1}{30}$th of the whole. The remaining charcoal being taken out and weighed was found to be conſiderably diminiſhed; but the proportional loſs was uniformly greater in tubes of iron, than of glaſs or porcelain, doubtleſs on account of part of the carbon being combined with the iron, and thus converting it internally into ſteel. The compoſition of the gaſeous oxyd, into which the carbonic acid was changed, calculated from the amount of charcoal taken up by it in porcelain tubes, appears to be about 53 of oxygen, and 47 of carbon.

The properties of pure carbonous oxyd, prepared from chalk or carbonat of barytes, and filings of iron or zinc, are the following. It is lighter than atmoſpheric air, in the proportion of 22 to 23. Hence, its ſpecific gravity (that of water being 1000), will be 1.177, while that of atmoſpheric air is 1.2308; hence, it materially differs from carburetted hydrogen, the weight of which is not more than half that of common air. It ſuddenly deſtroys animal life.

It is in no degree altered by being electrized, *per ſe*, for a conſiderable length of time. It burns in the open air with a quiet, blue flame. When previouſly mixed with common air and kindled, it does not explode but burns ſlowly: when mixed with oxygen gas, and fired by the electric ſpark it explodes, but not very violently, and gives out a red flame. If a ſmall jet, communicating with a reſervoir of this gas, be ſet fire to, and introduced into a large balloon receiver filled with oxygen gas, it is found to burn brightly for a time, and afterwards goes out. The gas remaining in the receiver is not greatly diminiſhed, and the inſide of the veſſel, though ſomewhat damp, is by no means ſtudded with thoſe viſible drops of liquid that characterize the combuſtion of hydrogen. The reſidual gas, on examination, will be found to conſiſt of carbonic acid with ſome uncombined oxygen.

The relative proportions of carbonous oxyd and oxygen requiſite to mutual ſaturation, and the conſequent production of carbonic acid, are the means of aſcertaining the exact conſtituent parts of this inflammable gas. When 20 meaſures of pure gaſeous oxyd are mixed with eight meaſures of oxygen and exploded, the whole is reduced to 18 or 19 meaſures, and is entirely abſorbable by lime-water; it is, therefore, carbonic acid. The weight alſo of this latter product is found to correſpond, as nearly as can be expected in experiments of this kind, with the ſum of the weight of its two ingredients before mixture. One hundred cubic inches of carbonous oxyd with 40 inches of oxygen produce 92 cubic inches of carbonic acid, and the weight of the firſt may be eſtimated at 30 grains, of the ſecond at 13.6, and of the third at 43.2; the ſum of the two firſt differing from the third only by 0.4 of a grain.

Hence it may be inferred, that 100 parts, by meaſure, of gaſeous oxyd of carbon, require for ſaturation 40 meaſures of oxygen gas, and produce, by combuſtion, about 92 meaſures of carbonic acid gas; or, by weight, that 100 grains of carbonous oxyd require about 45.5 grains of oxygen, and are converted into 144 grains of carbonic acid, 1.5 grain being allowed for water and caſual impurities. Now carbonic acid has been found by Lavoiſier and other chemiſts to conſiſt of 28 parts, by weight of carbon, and 72 of oxygen; conſequently 144 grains of carbonic acid (the product of the full oxygenation of 100 grains of the inflammable gas), contain 40.32 grains of carbon; therefore the remainder of the 100 grains of the oxyd, i. e. 59.68 grains, muſt be oxygen. Hence, carbonous oxyd may be ſtated as compoſed of

40.32 carbon
59.68 oxygen

100.00

Or, by another calculation, 144 grains of carbonic acid contain 72 per cent., or 103.68 grains of oxygen; but only 45.33 grains of oxygen were added to the inflammable gas to produce this carbonic acid, and, conſequently, the difference between 103.68 and 45.33, or 58.35 grains of oxygen were already contained in the gas, leaving 41.65 grains, to complete the 100 grains of this gas, for carbon: hence, according to this calculation, carbonous oxyd conſiſts of

41.65 carbon
58.35 oxygen

100.00

We may, therfore, reckon on an average, that 100 grains of carbonous oxyd, obtained from the decompoſition of the earthy carbonats by metallic ſubſtances in its pureſt poſſible ſtate, unmixed with any hydrogen, are compoſed of about 41 of carbon and 59 of oxygen.

A true combuſtion of the gaſeous oxyd of carbon takes place when it is mixed with oxymuriatic acid gas. If the latter be recently made and added to carbonous oxyd in due proportion, the whole mixture is converted into carbonic acid and ſimple muriatic acid; the carbonous oxyd having been fully oxygenated by the exceſs of oxygen in the oxymuriatic acid. The proper proportions for the complete ſucceſs of this experiment are two meaſures of carbonous oxyd, and $2\frac{2}{3}$ meaſures of oxymuriatic acid. A mixture, thus proportioned, being kept for 24 hours in a ground ſtoppered vial, and, for further ſecurity, inverted in mercury, when opened in water will undergo an inſtantaneous abſorption of about two-thirds, which is muriatic acid gas; the reſidue, by agitation with lime-water, will be taken up, with the exception of about $\frac{1}{10}$th, which is a caſual mixture of azot.

Oxyd of carbon, when heated with phoſphorus, diſſolves a portion, and then burns with a pale yellow flame. The phoſphorus is neither depoſited nor acidified by long ſtanding, even when aſſiſted by water.

The effect of hydrogen on the carbonous oxyd is very ſtriking. When equal parts of theſe gaſſes are mixed together and paſſed through a glaſs tube made red hot, a complete decompoſition takes place, the gaſeous oxyd depoſits its charcoal on the inſide of the tube, which, being nearly melting, cauſes it to adhere, and to form a brilliant, uniform, black enamel; while the oxygen of the gaſeous oxyd by union with the hydrogen forms water, which is condenſed at the further end of the tube. Some of the hydrogen paſſes through apparently unaltered.

The decompoſition of carbonic acid gas, by means of electricity, when in contact with mercury or any other eaſily oxydable metallic body, well illuſtrates the nature of carbonous oxyd. Dr. Prieſtley was the firſt who found a change to take place in carbonic acid gas by taking the electric ſpark in it repeatedly for a conſiderable time. Out of many experiments, the following may be ſelected. In a ſmall tube containing about $\frac{1}{15}$th of an ounce meaſure of carbonic acid, and ſtanding over mercury, the electric ſpark was taken for the ſpace of an hour; after which the whole tube was clouded by a pulverulent matter of a black colour in the upper part of the tube, but yellow at the bottom, like ſulphur. This ſubſtance, on examination, proved to be oxyd of mercury. The air itſelf was a little enlarged, and about a fifth part of it was rendered inſoluble in water.

The elegant experiments of Th. de Sauſſure have thrown much light on this ſubject. Electric ſparks were taken for 18 hours in a glaſs tube containing 13 cubic inches of dry and pure carbonic acid gas and confined by mercury. After electrization much black oxyd of mercury was diſcovered; a very ſlight dilatation amounting to no more than $\frac{1}{10}$th of a cubic inch was obſerved. On throwing up ſome cauſtic alkali no more than one cubic inch was abſorbed, which was therefore carbonic acid; the next was very pure oxyd of carbon, for where 100 parts of it were burnt with about a third of oxygen gas no water was perceived, the product being merely carbonic acid.

Carbonic acid has alſo been decompoſed by the ſame ingenious chemiſt by hydrogen, by aid of the electric ſpark. In a long glaſs tube were mixed together $3\frac{3}{4}$ meaſures of pure carbonic acid with an equal quantity of hydrogen, and the whole was electrized for twelve hours. A condenſation took place, conſiderable at firſt, but very trifling towards the concluſion of the proceſs. A number of fine drops of water were depoſited on the upper part of the tube, and the gaſeous mixture was reduced in bulk from $7\frac{1}{4}$ meaſures to $4\frac{3}{4}$, of which one was undecompoſed carbonic acid, and the remaining $3\frac{3}{4}$ were carbonous oxyd, containing a ſmall admixture of hydrogen. In the above experiment the hydrogen appears to unite with part of the oxygen of the carbonic acid, to form the water, which is condenſed, while the carbonic acid, by loſing oxygen, paſſes to the ſtate of carbonous oxyd.

A ſimilar decompoſition of carbonic acid by hydrogen alſo takes place when the mixed gaſſes are paſſed through a red hot porcelain tube, and the gaſeous oxyd is produced.

### § 3. *Of hydrocarbonat, or carburetted hydrogen.*

In the former ſection we have treated of the combination of carbon with a leſs portion of oxygen than is required for its acidification; in the preſent ſection we ſhall examine the phenomena attending the combination of carbon with hydrogen. Carburetted hydrogen, otherwiſe called *heavy inflammable air*, is an inflammable gas conſiderably heavier than hydrogen, but lighter than carbonous oxyd, or common air: it does not render lime-water turbid, when agitated with it, and by combuſtion with oxygen is totally reſolvable into carbonic acid and water.

Before it was ſuſpected that carbon could exiſt in any other ſtate of oxygenation than carbonic acid, it might be inferred, with tolerable though not abſolute certainty, that when any gas had been purified from carbonic acid by means of alkali or lime-water, if it furniſhed a freſh portion of this acid after combuſtion with oxygen, the carbonaceous ingredient exiſted in the ſtate of pure carbon or charcoal. Therefore, as the only products of carburetted hydrogen, when burnt with oxygen, are carbonic acid and water, chemiſts generally ſatisfied themſelves with eſtimating the quantity of carbon contained in the gas, by taking about 28 per cent. of the carbonic acid produced, and ſet down the entire remainder as hydrogen. For example, if 100 cubic inches of any gas, weighing 15 grains, were totally reſolvable into carbonic acid and water, by combuſtion with oxygen; and if, by the combuſtion, 54 inches of carbonic acid, weighing 25 grains, were produced, the quantity of carbon originally contained in the gas would be reckoned to be ſeven grains, (being 28 per cent. of the weight of the carbonic acid,) and the difference between 7 and 15, or eight grains would be conſidered as the weight of the hydrogen; or, in other words, the gas would be called a carburetted hydrogen, conſiſting of hydrogen holding carbon in ſolution, in the proportion of eight, by weight, to ſeven of the latter.

But, it is obvious, that this mode of eſtimating muſt be totally erroneous in the caſe (probably very frequent), of a mixture of gaſeous oxyd of carbon and hydrogen gas; and hence no approach to analyſis can be obtained without aſcertaining both the water and carbonic acid produced, and even then various cauſes of uncertainty will occur.

So that it is poſſible, and by no means improbable, that there may exiſt three ſpecies of gaſſes, all of which have a claim to the title of hydrocarbonat, or carburetted hydrogen, namely, 1ſt. hydrogen, ſimply holding carbon in ſolution, or what correſponds with the original idea of a hydrocarbonate; 2d. hydrogen mixed with gaſeous oxyd of carbon; 3d. a mixture of the two former ſpecies, or hydrogen and gaſeous oxyd of carbon with an exceſs of carbon held in ſolution by one or both of theſe gaſſes.

Carburetted hyrogen is obtained in a great variety of ways, and with very conſiderable differences in ſpecific gravity and the proportion of ingredients. It is found native on the ſurface of ſtagnant waters, marſhes, wet ditches, &c. through which, if examined cloſely, large bubbles will be ſeen to riſe in hot weather, and may be increaſed at pleaſure by ſtirring up the bottom with a ſtick. In cloſe, ſtill evenings, if a candle be held over the ſurface, flaſhes of a blue lambent flame may be perceived ſpreading to a conſiderable diſtance. All that is not fabulous in the *ignis fatuus* is probably derived from this ſource. This ſpecies may be termed, for diſtinction, the carburetted hydrogen of marſhes: in the pureſt form in which it can be collected it is uſually mixed with about 20 per cent. of azot.

This gas is alſo given given out very abundantly by almoſt every vegetable ſubſtance that is expoſed to a dry heat ſufficient for its decompoſition. When heated in cloſe veſſels much more hydrocarbonat is obtained than by combuſtion in the open air, the product in this latter caſe containing more carbonic acid. It would be endleſs to enumerate the vegetable ſources of this gas, but we ſhall mention ſome of the moſt convenient modes of obtaining it in a ſtate of purity.

One of the commoneſt methods employed is the deſtructive diſtillation of the acetous ſalts. For this purpoſe, let a ſmall proportion of dry acetite of potaſh be heated in a glaſs retort. The ſalt ſoon melts in its water of cryſtallization, puffs up, and, if the retort is too ſmall, is very apt to come over into the neck. The firſt products are water and the air of the veſſels; but, when the acetous acid begins to be ſcorched, a large ſtream of gas begins, and continues till the whole is red hot, and little elſe remains in the retort but carbonated alkali and a little charcoal. Along with the gas there ariſes much oil, which is condenſed in the cool receiver. The gas, according to the analyſis of it by Dr. Higgins, after the firſt portions have paſſed over, conſiſts of nothing but hydrocarbonat and carbonic acid, which laſt may be ſeparated by lime-water. The hydrocarbonat itſelf varies conſiderably. The firſt part is much heavier than the laſt, (though ſtill lighter than common air,) and appears to hold in ſolution part of the oil; for, on ſtanding ſome time over water, it becomes lighter, and is found to require leſs oxygen for ſaturation than before. The average ſpecific gravity of the firſt and laſt gas mixed is to that of common air as two to three.

Carburetted hydrogen is obtained in great purity by ſending the vapour of imflammable vegetable matter through an earthen or glaſs tube paſſing through a furnace, and kept red hot in the middle. The vapour of camphor, ether, alcohol, and other inflammables thus treated, is converted into this gas, but with much difference in quantity, according to the degree of heat and other circumſtances.

Another method of obtaining carburetted hydrogen, is to put coal, wood, peat, &c. into any convenient veſſel, an earthen or iron retort for example, and heat it ſlowly to redneſs.

Moſt animal inflammable ſubſtances, ſuch as ſilk, fat, wax, and the like, yield this gas as freely as vegetable matter, by a ſimilar treatment. This was diſcovered by Berthollet, in his maſterly reſearches on the nature of animal matter and ammonia.

Carburetted hydrogen (or at leaſt a gas that gives water and carbonic acid by combuſtion with oxygen), is alſo generated in abundance, when charcoal, without previous drying, is heated *per ſe* in cloſe veſſels, and continues to be given off till the charcoal has been in a ſtate of full ignition for about an hour; after which it ceaſes, and the charcoal, as already mentioned, is rendered pure. A ſimilar proceſs of obtaining this

this gas, is to incloſe powdered charcoal in a tube paſſing through a furnace, to confine the charcoal by a pellet of clay looſely fixed at each extremity of the tube, and in that ſituation to ſend through it the vapour of water kept boiling in a ſmall retort attached to one end of the tube. Much carbonic acid gas is generated this way, and, when this is ſeparated by lime-water, the reſidue is inflammable.

Laſtly, this gas may be procured by the direct union of its conſtituent parts. If hydrogen gas is paſſed ſeven or eight times ſucceſſively through an iron tube containing charcoal, and heated red-hot, a diminution of bulk takes place, the hydrogen diſſolves a portion of the charcoal, and then aſſumes the properties of carburetted hydrogen.

A curious variety of hydrocarbonous gas, was diſcovered by the aſſociated Dutch chemiſts (Van Dieman, Trooſtwyck, and others) which is procured from ether or alcohol, and has the remarkable property of generating an oil when mixed with oxymuriatic acid gas. Hence it has been termed *oily carburetted hydrogen*, or *olefiant gas*. The mode of preparing this ſingular gas, and the enumeration of its diſtinguiſhing properties, will form the ſubject of the next ſection; it may, however, be obſerved here, that according to Mr. W. Henry's experiments, the olefiant gas appears alſo to be contained in part in the hydrocarbonat from coal, wax, and ſome other ſubſtances, and greatly to contribute to the quantity of light and heat which theſe gaſſes give out as well as to their large proportion of carbonic acid.

Carburetted hydrogen is ſingularly affected by the electric ſpark. Dr. Auſtin found, that on taking the electric ſpark repeatedly through this gas, obtained from acetite of potaſh, the bulk of the gas enlarged after every ſhock, and at length expanded to nearly twice its original dimenſions. When examined after this expanſion, it was found to be as inflammable as before, and judging from the teſt of lime-water no carbonic acid appeared to have been generated. Dr. A. concludes that the enlargement can only be owing to the production of a quantity of hydrogen, and makes ſome inferences which, however, have ſince been ſhewn by Mr. W. Henry to be erroneous. Mr. H. demonſtrates that there is no deſtruction of carbon by this proceſs, ſince the ſame quantity of carbonic acid is produced after as before electrization by the action of oxygen gas. He likewiſe makes it appear probable, that the water held in ſolution by the gas is the chief agent in its expanſion, ſince when the gas has been dried by cauſtic alkali no continuance of electrization will enlarge it more than one ſixth of its original bulk; but when the contact of water is admitted, the bulk is doubled by the ſame treatment. Perhaps the diſcovery of carbonous oxyd will explain this fact. It is not improbable that the carbon of the gas may unite with the oxygen of the water, and thus produce the carbonous oxyd which would not give any precipitate with lime-water, and the bulk of the gas would be enlarged both by the carbonous oxyd and the hydrogen of the water, as well as by the expanſion which the hydrocarbonat would undergo after the carbon was ſeparated from it, whilſt the actual quantity of carbon remaining the ſame, as much carbonic acid would be ſeparated by compleat oxygenation as before electrization. It is not improbable that the affinities of hydrogen and carbon for oxygen are ſo nearly equal, that either ſubſtance is able *partially* to decompoſe the complete oxyd of the other. Thus we find, that when hydrogen and carbonic acid are together ſubjected to electricity, the carbonic acid is partially decompoſed, and the product is carbonous oxyd and water, and on the other hand, when water is decompoſed by red hot charcoal, a part of the product is alſo the carbonous oxyd.

All the hydrocarbonats are fatal to animal life; not at appears from the mere abſence of oxygen, but from the preſence of ſomething poſitively noxious: ſince animals immerſed in it die ſooner than they would from the mere interruption of reſpiration.

This gas is ſcarcely if at all abſorbed by water, but by long ſtanding over it depoſits a part of its carbon. This, however, applies only to thoſe hydrocarbonats that require at leaſt their own bulk of oxygen to ſaturate them, and eſpecially to that variety called olefiant gas.

Simple carburetted hydrogen, when ſet fire to, burns at the ſurface in contact with the air with a blue flame with red edges, but when mixed with any of the olefiant gas the flame becomes much more brilliant, reſembling that of oil. When applied to the purpoſes of illumination the hydrocarbonat from coal, from lamp-oil, or from wax, produces as much light in an Argand lamp as oil in ſubſtance does; this appears to be owing to the olefiant gas which they contain. The brightneſs of the flame is much diminiſhed when theſe gaſſes have been kept over water, and hence for illumination they ſhould be uſed as ſoon as prepared.

The combuſtion of hydrocarbonat is much more brilliant in oxygen gas, and the products if a ſufficient quantity of oxygen has been uſed, are merely water and carbonic acid.

If any of the hydrocarbonats be mixed with oxygen gas and fired in a cloſe veſſel by the electric ſpark, or in any other way, an exploſion takes place more or leſs violent according to the quantity of carbon contained in the gas, and the reſult of the decompoſition is carbonic acid, together with any unconſumed gas or exceſs of oxygen, while the water is found condenſed in drops on the ſides of the jar. A ſingle cubic inch of the mixed airs is generally as much as can be conveniently managed at each exploſion, and when any olefiant gas is preſent even this ſmall quantity will endanger very thick glaſs jars; a very vivid red flame appears at the moment of exploſion, and a great inſtantaneous enlargement takes place, after which the bulk is ſuddenly reduced to much leſs than its original quantity. When the carbonic acid is abſorbed, if the gaſſes have been properly proportioned, no gaſeous reſidue is left except accidental impurities.

The oxymuriatic acid furniſhes alſo a very uſeful method of decompoſing and analyſing all the hydrocarbonats. Mr. Cruickſhank's beautiful and accurate experiments on this ſubject are highly inſtructive. The oxymuriatic acid gas was procured from oxymuriat of potaſh, by means of muriatic acid, and was uſed ſoon after being prepared, as it is in ſome degree altered by keeping.

Pure hydrogen and oxymuriatic acid gas were firſt tried; one meaſure of the former with two of the latter mixed in a glaſs vial with a ground ſtopper, and inverted over water were ſuffered to remain 24 hours. The ſtopper being then withdrawn, the water ruſhed into the vial, abſorbing the whole of its gaſeous contents, except about $\frac{1}{30}$ of the whole, which was azot, and doubtleſs a caſual impurity.

The different hydrocarbonats were then tried. In a bottle filled with, and inverted over water, one meaſure of well waſhed hydrocarbonat from camphor was mixed with two of oxymuriatic acid. A ſlight cloud and trifling abſorption were perceived at the time of mixture, after which the ſtopper was put in, and the whole was left at reſt for 24 hours. When opened under water all the gas was abſorbed, except 0.43 of a meaſure, and this was reduced by lime-water to 0.34. This reſidue was ſtill inflammable, but burnt with a lambent blue flame like carbonous oxyd; and this it was proved for the moſt part to conſiſt of, by the large quantity of carbonic acid which it yielded when fired with oxygen; two parts of it with one of oxygen yielding no leſs than 1.7 of carbonic acid.

In the above experiment the mutual decompoſition of the oxymuriatic acid and carburetted hydrogen, produces no leſs than four new compounds: namely, common muriatic acid by the loſs of oxygen; water by the union of oxygen with hydrogen; carbonous oxyd by the partial oxygenation of ſome of the carbon; and carbonic acid by the compleat oxygenation of the remainder.

On increaſing the quantity of oxymuriatic acid to about four times that of the carburetted hydrogen, the whole of the carbon was now found to be completely oxygenated, and every thing was abſorbed by water or lime-water; the products were therefore only muriatic and carbonic acids and water.

Mr. Cruickſhank found a very conſiderable difference in the quantity of carbonic acid produced, and of courſe in the carbonaceous ingredient in the hydrocarbonats from camphor, ether, and alcohol, when they had been long kept over water or agitated with it. A ſimilar difference in the quantity of combuſtible matter was obſerved by Dr. Higgins, in the hydrocarbonat from acetite of potaſh, which renders it highly probable that theſe hydrocarbonats hold in ſolution ſomewhat of an oily ethereal vapour, or a portion of true olefiant gas which water will abſorb. This alſo, it probably is, which cauſes the ſlight diminution which ſome of the hydrocarbonats *immediately* experience when mixed with oxymuriatic acid gas; for with pure olefiant gas the diminution is great and immediate, as we ſhall preſently mention. When oxymuriatic acid gas and carburetted hydrogen are mixed in the proportion of two of the former to one of the latter, and the mixture is exploded by the electric ſpark, a copious depoſition of charcoal takes place, but when oxymuriatic acid gas is uſed in a larger quantity, the whole of the carbon is converted into carbonic acid. This ſeparation of charcoal takes place only with the hydrocarbonats from camphor, ether, and alcohol, and even in theſe this property is loſt by being kept ſome time over water.

Carburetted hydrogen is alſo readily decompoſed by ſulphur; the carbon being precipitated in form of a black powder, and the hydrogen uniting by preference with the ſulphur forming hepatic gas. This may be moſt conveniently effected by making ſulphur red hot in an earthen tube and then paſſing the carburetted hydrogen through it.

### § 4. *Of olefiant gas.*

The diſcovery of this ſingular ſpecies of carburetted hydrogen is due to ſome aſſociated chemiſts of Amſterdam, (Van Dieman, Van Trooſtwyck, Bondt, and Lawrenburgh,) and originated in their examination of the different products of the diſtillation of ſulphuric acid and alcohol, in the preparation of ether. In the common proceſs this gas appears towards the latter end of the diſtillation accompanied by the *oil of wine;* but in order to procure it immediately, for the purpoſe of experiment, nothing more is neceſſary than to put into a proof bottle a little rectified alcohol, and four times its weight of ſtrong ſulphuric acid; much heat is given out on mixture; the colour becomes firſt brown, and then black, and on the application of a gentle heat the gas in queſtion is produced in vaſt abundance, and may be collected in jars inverted over water. The only foreign matters with which the gas is mixed are ſulphureous acid, and a little ether, but theſe may be got rid of by waſhing it with ſome very dilute liquid ammonia, and then the olefiant gas remains pure.

When thus prepared it exhibits the following properties. Its ſpecific gravity is to that of atmoſpheric air, as 905 to 1000. Its odour is very fetid. It burns with a denſe flame, like an oil or reſin. It is not abſorbed nor altered by water, nor is it affected by any of the common reagents, whether gaſſes, alkalies, or acids, except the oxymuriatic acid gas. Equal parts of theſe gaſſes being mixed together, an immediate diminution of bulk takes place, a viſible vapour fills the veſſel, much heat is given out ſo as to be very ſenſible even to the hand, and at the ſame time a thick pearl-coloured oil appears in drops on the ſurface of the water, over which the mixture is made, and immediately ſinks to the bottom.

It is from this ſingular production of denſe oil, with the oxymuriatic acid, that this ſpecies of carburetted hydrogen has acquired the name of *olefiant* or *oil making*. When theſe two gaſſes are mixed in the proportion of four of oxymuriatic acid to three of carburetted hydrogen, the whole is abſorbed, except accidental impurities.

The oil thus generated is heavier than water, whitiſh, and ſemi-tranſparent. By keeping it becomes yellow and limpid; its odour is highly fragrant and penetrating; its taſte is ſomewhat ſweet. It is ſparingly ſoluble in water, to which it communicates its peculiar odour. Cauſtic potaſh has no effect on the oil, but ſeparates the adhering muriatic acid and renders it more fragrant.

The conſtituent parts of olefiant gas appear to be only carbon and hydrogen, but it contains a larger proportion of the former than the common hydrocarbonats do. It is decompoſed by ſulphur like the other hydrocarbonats.

The combuſtion of this gas offers ſome curious circumſtances. When an Argand lamp is ſupplied with it inſtead of oil, the flame far exceeds every oil and hydrocarbonat in beauty and brilliance. When mixed with oxygen gas, and detonated by the electric ſpark, the exploſion is much more violent than that of common carburetted hydrogen. Mr. Henry found that a ſtrong glaſs tube was ſhattered with only 0.3 of a cubic inch of olefiant gas, and 0.17 of oxygen; but when the quantity of oxygen is conſiderably below that required, for the compleat ſaturation of this gas, only a very trifling exploſion is produced.

Another ſingular property of olefiant gas is the copious depoſition of charcoal, when it is mixed with a ſmall quantity of oxygen or oxymuriatic acid gas and kindled. After the mixture of the olefiant and oxymuriatic acid gaſſes, two or three minutes elapſe before the oil thus generated is entirely precipitated, but if this mixture is immediately ſet fire to there is no production of oil; but in its ſtead ſo copious a depoſition of charcoal takes place, that the whole veſſel is obſcured, as if it had been lined with lamp-black.

A ſimilar depoſition of carbon takes place when the olefiant gas is mixed with juſt enough of oxygen to begin the combuſtion. If two parts of the latter are mixed with 1½ of the former, and the mixture ſet fire to by the electric ſpark, a copious depoſition of carbon enſues.

The great exceſs of carbon contained in olefiant gas is alſo manifeſt from the large proportion of oxygen required for its ſaturation, amounting to 2.84 to one, eſtimating each by bulk.

Olefiant gas has alſo been procured by the Dutch chemiſts, above named, not only from alcohol and ſulphuric acid, but by paſſing the vapour of alcohol or ether through a red hot earthen tube. In this caſe, however, the olefiant gas appears to be mixed with a little carburetted hydrogen. It is remarkable, that if a glaſs tube be uſed inſtead of an earthen one, the gas is no longer olefiant, but only ſimple carburetted hydrogen; but if the glaſs tube is filled with either alumine or ſilex the ſame effect is produced as with the earthen tube; on the other hand, when lime either pure or carbonated, or magneſia, were ſubſtituted to the two other earths, the gas was common carburetted hydrogen.

The whole of this very intereſting part of chemiſtry requires further examination, eſpecially as far as regards the formation of carbonous oxyd.

Carbon, in reference to *Huſbandry* and *Gardening*, a matter obtained from different animal and vegetable ſubſtances, by means of a ſlow and confined combuſtion. This ſubſtance is charcoal in its pure ſtate; that which is commonly met with containing a portion of incombuſtible earth, and ſome ſaline matter in union with the carbon. See Carbon and Charcoal.

The author of the "Philoſophy of Agriculture and Gardening," remarks, "that when animal and vegetable bodies are burnt without the acceſs of air, that is, where their volatile parts are ſublimed, there remains a greater quantity of charcoal, a much greater in vegetable bodies than in animal ones. This is termed carbon by the French ſchool, when it is quite pure, and is now known to be one of the moſt univerſal materials of nature: and as vegetable bodies contain ſo much of it in their own compoſition, they may be ſuppoſed to abſorb it entire where they grow vigorouſly, eſpecially as it is a ſimple material: but they may poſſibly form it alſo from water and air within their own veſſels, when they are excluded from acceſs to it externally. The whole atmoſphere contains always a quantity of it in the form of carbonic acid, or fixed air; as is known by the ſcum which preſently becomes viſible on lime water when expoſed to the air, and which conſiſts of a reunion of the lime with the carbonic acid, which may therefore be ſaid to encompaſs the earth. The ſimplicity of carbon as an elementary ſubſtance was diſputed by Dr. Auſtin, who believed he had decompounded it. But Mr. Henry, by accurately repeating his experiments, has ſhown the fallacy or inconcluſiveneſs of them, as may be ſeen in the Philoſophical Tranſactions for 1797. And it is added that a further great reſervoir of carbon exiſts in lime-ſtone, in the form of carbonic acid; which when the ſtronger acid is poured on, the calcareous earth becomes a gas, acquiring its neceſſary addition of heat from that which is given out in the combination of the ſtronger acid with the lime. It alſo acquires its neceſſary heat when lime-ſtone is burnt, from the conſuming fuel, riſing in the form of gas, and is diſſipated in the air; and probably ſoon ſettles on the earth as it cools, as it is conſiderably heavier than the common atmoſphere. But the great ſource of carbon exiſts in the black earth which has been lately left by the decompoſition of vegetable and animal bodies; and is then in a ſtate fit to combine with azote or nitrogen, and with oxygen, when expoſed to thoſe two gaſſes, as they exiſt in the atmoſphere, and is thus adapted either to promote the generation of nitrous acid, or to form carbonic acid, and thus to aſſiſt vegetation. Moraſſes conſiſt principally of the carbonic recrements of vegetable matters, which are gradually decompoſed in great length of time into clay, with argillaceous ſand, ſuch as is found over coal beds, and ſome calcareous earth, as in marl, and laſtly, with ſome iron and foſſile coal. Theſe by elutriation are ſeparated from each other, and form the ſtrata of coal countries. In other places they remain intermixed, as they were probably produced from the decompoſition of vegetables and terreſtrial animals; and form what in books of practical agriculture is called a *loamy* ſoil, conſiſting of carbonic matter, ſand, and clay, with a portion of iron. It has always been obſerved, that this black garden mould, or earth produced from the recrements of vegetables, is capable of abſorbing a much greater quantity of putrid effluvia than either air or water, and probably of combining with its ammonia, and producing a kind of *hepar carbonis*, and thus facilitating vegetation. The practice of burying dead bodies ſo few feet below the ſurface is a proof of this; as the putrid exhalations from the carcaſe are retained, and do not penetrate to the ſurface. On the ſame account, the air over new ploughed fields has long been eſteemed ſalutary to invalids, or convaleſcents, as it probably purifies the ſupernatant atmoſphere. But it was not till lately known that carbon, or charcoal, abſorbs with ſuch avidity all putrid exhalations; if it has been recently burnt, and has not been already ſaturated with them: inſomuch that putrid fleſh is ſaid to be much ſweetened by being covered a few inches with the powder of charcoal, or even for being buried for a time in black garden mould; as putrid exhalations conſiſt chiefly of ammonia, hydrogen, and carbonic acid, and are the immediate products of the diſſolution of animal or vegetable bodies; they are believed to contribute much to vegetation, as whatever materials have conſtituted an organic body may again, after a certain degree of diſſolution, form a part of another organic body. The hydrogen and azote produce ammonia, which combining with carbon, may form an *hepar carbonis*, and by thus rendering carbon ſoluble in water, may much contribute to the growth of vegetables. It has been ſaid, that ſome moraſſes have prevented the animal bodies which have been buried in them from putrefaction; which may in part have been owing to the great attraction of the carbon of the moraſs to putrid effluvia, and in part, perhaps, to the vitriolic acid which ſome moraſſes are ſaid to contain in their conſtitution."

"Then here occurs," ſays the author, "an important queſtion. By what other means is the ſolid carbon rendered fluid, ſo as to be capable of entering the fine mouths of vegetable abſorbents? The carbon, which exiſts in the atmoſphere, and in lime-ſtone, is united with oxygen, and thence becomes ſoluble or diffuſible in water; and may thus be abſorbed by the living action of vegetable veſſels; or may be again combined by chemical attraction with the lime, which has been deprived of it by calcination. When mild calcareous earth, as lime-ſtone, chalk, and marble, has been deprived of its water, and of its carbonic acid by calcination, it becomes lime. Afterwards, when it is cold, if water be ſprinkled over it, a conſiderable degree of heat is inſtantly perceived, which is preſſed out by the combination of a part of the water with the lime; as all bodies when they change from a fluid ſtate to a ſolid one, give out the heat which before kept them fluid. At the ſame time, another part of the water which was added, is raiſed into ſteam by the great heat given out, as above mentioned, and the expanſion of this ſteam breaks this lime into fine powder, which otherwiſe retains the form of the lumps of lime-ſtone before calcination. But if too great a quantity of cold water be ſuddenly added, no ſteam is raiſed, and the lump of lime-ſtone retains its form, whence it happens, that ſome kinds of lime fall into finer powder, and are ſaid to make better mortar, if ſlaked with boiling water, than with cold. On this account, the lime which is deſigned to be ſpread on land ſhould previouſly be either laid in a heap, and either ſuffered to become moiſt by the water of the atmoſphere, or ſlaked by a proper quantity of water: otherwiſe, if it be ſpread on wet ground, or when ſo ſpread is expoſed to much rain, the heat generated will be diſſipated without breaking the lumps of lime into powder, which will then gradually harden again into lime-ſtone, diſappoint the expectations of the agricultor, and afflict him with the loſs of much labour and expence. When the powder of ſlaked lime, mixed with ſand and water, is ſpread on a wall, that part of the water which is not neceſſary for its imperfect cryſtallization, evaporates into the air, and the lime then gradually attracts the carbonic acid, which is diffuſed in the atmoſphere: but as he ſuppoſes this carbonic acid is diſſolved in the water, which is alſo diffuſed in the atmoſphere, the lime is perpetually moiſtened by this new acquiſition of water from the air, as that which before adhered to it, and had parted with its carbonic acid, evaporates. On which account, new built walls are months, and even years in drying, as they continue to attract water along with the carbonic acid from the air, which ſtands upon them in drops till the lime regains its original quantity of carbonic acid, and again hardens into ſtone, or forms a ſpar by its more perfect, or leſs diſturbed manner of cryſtallization. It is conſequently ſuppoſed, that the earth acquires carbon, both in a manner ſimilar to the above, by its attracting either the carbonic acid, or the water in which it is diffuſed, from the atmoſphere, and alſo by the ſpecific gravity of carbonic acid gas being ten times greater than that of common air: whence, there muſt be conſtantly a great ſediment of it on the ſurface of the earth, which in its ſtate of ſolution in oxygen and water may be readily drank up by the roots of vegetables. Another means by which vegetables acquire carbon in great quantity, may be from lime-ſtone diſſolved in water, which though a ſlow proceſs, occurs in innumerable ſprings of water, which paſs through the calcareous or marly ſtrata of the earth; as thoſe of Matlock or Briſtol in paſſing through lime-ſtone, and thoſe about Derby in paſſing through marl; and is brought to the roots of vegetables by the ſhowers which fall on ſoils where marl, chalk, lime-ſtone, marble, alabaſter, and fluor, exiſt, which include almoſt the whole of this iſland.

By this ſolution of mild calcareous earth in water, not only the carbon in the form of carbonic acid, not yet made into gas, but the lime alſo with which it is united, becomes abſorbed into the vegetable ſyſtem, and thus contributes to the nutriment of plants, both as ſo much calcareous earth, and as ſo much carbon.

And another mode may be by the union of this ſimple ſubſtance, with which all garden mould abounds, with pure calcareous earth into a kind of hepar, analogous to the hepar of ſulphur made with lime, which abounds in ſome mineral waters, and this is ſuppoſed to be the great uſe of lime in agriculture."

For the purpoſe of aſcertaining the probability of this mode of ſolution of carbon, the following experiment was made. "About two ounces of lime in powder was mixed with about as much charcoal in powder, put into a crucible, and covered with about an inch or two of ſiliceous ſand. The crucible was kept red hot for an hour, or longer, and then ſuffered to cool. On the next day water was poured on the lime and charcoal, which then ſtood a day or two in an open cup, and acquired a calcareous ſcum on its ſurface. And though it had not much taſte, except that of the cauſticity of the lime, yet on dropping one drop of marine acid into a tea ſpoonful of the clear ſolution, a ſtrong ſmell like that of *hepar ſulphuris* was procured, or like that of Harrowgate water, which evinced that the carbon was thus rendered ſoluble in water. Hence, the doctor ſuggeſts, that the ſulphureous ſmell of Harrowgate and Kiddleſton waters, and other ſimilar ſprings, may be owing to the union of the alkali of decompoſing marine ſalt, with the carbon of the earth they run through, and that this kind of water might thus poſſibly be uſed as a profitable manure in agriculture."

And a ſtill further method by which vegetable roots acquire it, is ſuſpected to be "by their diſuniting carbonic acid from lime-ſtone in its fluid, not its gaſeous ſtate, which the lime-ſtone again attracts from the atmoſphere, and conſolidates, and forms other matters included in the ſoil. Firſt, becauſe lime is believed by ſome agricultors, who much employ it, to do more ſervice in the ſecond year than the firſt, that is, in its mild ſtate, when it abounds with carbonic acid, than in its cauſtic ſtate, when it is deprived of it. Secondly, that the uſe of burning lime ſeems hence to be ſimply to reduce it to an impalpable powder, almoſt approaching to fluidity, which muſt facilitate the application of the innumerable extremities of vegetable fibres to this incalculable increaſe of its ſurface; which may thence acquire by their abſorbent power, the carbonic acid from theſe minute particles of lime, as faſt as they can recover it by chemical attraction from the air or water, or other inanimate ſubſtances in their vicinity. Thirdly, the hyperoxygenation of the perſpirable matter of the plants, which thence gives up oxygen gas in the ſunſhine, would induce us to believe that a great part of the carbon which furniſhes ſo principal a part of vegetable nutriment, was received by their roots in the form of carbonic acid; and that it becomes in part decompoſed in their circulation, giving up its oxygen; which thus abounds in the ſecreted fluids of vegetables from this ſource, as well as from decompoſed water, as is generally known. And laſtly, there is another way by which carbon is received into the vegetable ſyſtem, which is by its exiſtence in ſugar and in mucilage, both of which are taken up undecompounded, as appears by their preſence in the vernal ſap-juice, which is obtained from the maple and the birch, which like the chyle of animals, is abſorbed in its undecompounded ſtate by the roots of plants." This matter muſt of courſe be conſidered as one of the principal conſtituent parts of vegetables; and would ſeem to enter into, and accumulate in the conſtitutions of plants in proportion to their ſucceſſive growth. Some plants, however, take more into their compoſition than others, as from the reſult of chemical analyſis, a quantity almoſt equal to all their other component parts has been found in particular inſtances, as in *agaricus piperatus*, *clavaria aurea*, *agaricus*, *lycoperdon teſſellatum*; while in others, only a very ſmall portion."

Carbon, in *Geography*, a cape on the N. coaſt of Africa, in the Mediterranean, directly N. from Bougie.

CARBONACEOUS *Matter*, in *Agriculture*, that kind of earthy matter, that partakes of the nature of carbon, or in which it abounds. It is found that materials of this ſort are highly uſeful in promoting the growth of plants and of courſe may be uſed with advantage in the growth of different crops.

CARBONADE, or Carbonado, in *Cookery*, fleſh, fowl, or the like, ſeaſoned and broiled on the coals.

CARBONARA, in *Geography*, a town of Naples, in the country of Bari; 2 miles S.S.E. of Bari.

CARBONARIA, in *Ancient Geography*, one of the mouths of the Eridanus in Italy, mentioned by Pliny: now Il Porto-di-Goro.

CARBONARIAN *Foreſt*, was that part of the great foreſt of Ardennes, which lay between the Eſcaut or Scheld, and the Meuſe.

CARBONARIUS, in *Ichthyology*, a ſpecies of gadus, the coal-fiſh of the Britiſh zoology. See Gadus.

CARBONARO, *Cape*, a cape on the South coaſt of the iſland of Sardinia. N. lat. 39° 22'. E. long. 9° 47'.

CARBONAT *of Ammonia*, *Sal Volatile*, or *Salt of Hartſhorn*, in *Chemiſtry*. This well known ſalt is always prepared for uſe by decompoſing muriat of ammonia by carbonate of lime, and is done in the following manner. Mix together two parts of dry chalk with one of muriat of ammonia in powder, put them into a proper ſubliming veſſel, and apply a graa gradual heat. A double decompoſition takes place; the carbonic acid of the chalk uniting with the ammonia, and riſing to the top of the veſſel, and the lime remaining behind in union with muriatic acid. By degrees the carbonat of ammonia, which riſes as a denſe white vapour, concretes on the top of the veſſel in a hard ſemi-tranſparent cake. The muriat of lime that remains, was formerly applied to little uſe, but ſince the diſcovery of its wonderful powers, as a freezing mixture when combined with ſnow, it may perhaps be made more valuable. The whole of the carbonat of ammonia is not obtained till after the veſſel has been kept for ſome time at a low red heat.

The above is the actual way of preparing this ſalt, but the combination of the two ingredients may be made for experiments which gives a very beautiful appearance. Fill a jar about half full of carbonic acid gas ſtanding over mercury, then throw up ammoniacal gas (obtained in the way mentioned under AMMONIA), and at the moment of contact, a very denſe white cloud of carbonat of ammonia will fill the jar, a ſudden and abundant abſorption will take place, and if the gaſes be pure and properly proportioned, the mercury will rapidly riſe, and fill the whole cavity, leaving only a pellicle of white ſaline matter attached to the ſide of the glaſs which is the ſolid ammoniacal carbonat. Some heat is alſo given out during this condenſation of the gaſes enough to be ſenſible to the hand placed on the outſide of the jar. To make the mixture of the gaſes ſudden, the ammoniac ſhould be added to the carbonic acid gas; for the former, being by much the lighteſt, then traverſes the whole of the latter, and riſes with it; but if this order is inverſed and the carbonic acid added laſt, a white cloud is ſeen hovering over, and defining the point of contact of the two, and the abſorption is more gradual. The ſame condenſation may be ſhewn over water, (though not with the accuracy of meaſuring the reſpective quantities of the gaſes) ſimply by incloſing any veſſel full of a mixture of lime and muriat of ammonia in an atmoſphere of carbonic acid gas, the ammoniacal gas given off by this mixture ſeizing on the carbonic acid the inſtant it touches it.

The common ſolid carbonat of ammonia, when freſh made, or kept in a very cloſe-ſtopped bottle, is a hard, tough, ſtriated, white-ſemitranſparent maſs of no determinate form. Its ſmell is extremely pungent, and, to moſt perſons, agreeable, but when ſtrongly ſnuffed up it is apt to excoriate the noſtrils. Its taſte is ſalt, cool, and ſtimulating. It is very ſoluble in water, producing cold during the ſolution. At 55° water diſſolves half its weight, and at 120° degrees its own weight; but at this heat the alkali begins to volatilize pretty freely, ſo that the ſaline contents of the hot ſolution are always varying. The ſalt, whether wet or dry, is remarkable for its volatility, the more in proportion to the heat, but even at a low temperature it is always loſing weight whilſt it retains its ſcent.

The cryſtallization of carbonat of ammonia is very difficult on account of its volatile nature, ſo that the common way of making a hot ſaturated ſolution and cryſtallizing by cooling will ſeldom anſwer. Bergman obtained tolerably regular cryſtals by taking a ſaturate ſolution at a moderate temperature, ſaturating this with carbonic acid, and then expoſing it to ſevere cold, the cryſtals appeared to be octohedrons with truncated angles.

Carbonat of ammonia, on account of its rapid ſolubility, and the quantity of carbonic acid it contains, efferveſces more violently with acids than moſt of the other carbonats.

A remarkable change takes place in this ſalt if expoſed to the air. Let any quantity of the hardeſt and the moſt pungent carbonat of ammonia be bruiſed to powder, ſpread on a plate, and expoſed to the air, and in a very ſhort time the ſurface becomes crumbly, and of an opake white, and the whole atmoſphere around will be ſtrongly ſcented with a pungent ammoniacal vapour ariſing from the rapid volatilization of the ſalt. This loſs of weight is ſo great, that in the courſe of ten or twelve hours no more than from forty to ſixty per cent of the original weight will remain, and the ſalt is then changed to a ſoft pulverulent meal-like ſubſtance almoſt without ſcent or pungency to the taſte. This ſame change takes place ſooner or later to the freſh ſalt, if kept in bottles careleſsly ſtopped.

Hence it appears probable that the recent or pungent carbonat contains a quantity of ammonia in exceſs, to which it owes its pungency and volatility, and the ſcentleſs effloreſced ſalt probably conſiſts of carbonic acid and ammonia in mutual ſaturation, together with a quantity of water.

This ſalt is ſoluble in alcohol, and thus an ammoniacal ſpirit is made by diſtilling the two together, often with various aromatic additions. See AMMONIA.

CARBONAT of *Potaſh.—Common potaſh.—Pearl-aſh.—Salt of Tartar.—Vegetable fixed Alkali.* The vegetable fixed alkali was ſo named by the chemiſts of the laſt and former ages becauſe it was procured in large quantities from vegetable ſubſtances, and was in no caſe ſuppoſed to be of mineral origin. From certain late analyſes, however, by Klaproth and other able chemiſts, it has been diſcovered to enter as an eſſential ingredient into the compoſition of leucite, lepidolite, and a few other minerals, which are ſuſpected by none to be of vegetable origin. But though the exiſtence of potaſh in a mineral ſtate has been thus demonſtrated, yet it is ſo ſmall in quantity and ſo difficultly procurable, that all the vaſt ſupplies of this ſubſtance which civilized life requires have as yet been entirely obtained from the combuſtion of vegetables.

If the woody or annual ſtems of vegetables that have grown in ſoils unimpregnated with common ſalt, after being ſufficiently dried, are ſet fire to, the watery, the reſinous, the oily, the acid, and carbonaceous portions are volatilized and diſſipated in a ſtate of more or leſs compleat decompoſition, and there remains behind a reddiſh or whitiſh powder called *aſhes;* conſiſting chiefly of the earthy and metallic ingredients of the vegetable, together with a variable proportion of ſubcarbonat of potaſh. By lixiviation the alkaline part is diſſolved out, and this ſolution, when boiled down to dryneſs and melted, leaves behind a dark brown ſaline maſs, conſiſting of the carbonated potaſh, coloured by a ſmall portion of vegetable inflammable matter; and in this ſtate it is known in the Engliſh market by the name of *potaſh.* Calcination at a moderate red heat completely burns off the colouring particles, and the ſalt becomes of a ſpongy texture, and has a beautiful bluiſh white tinge, and is then called *pearlaſh.* Such is in general the proceſs by which the vegetable fixed alkali is ſeparated from the ſubſtances with which it is combined by nature and prepared for uſe. We ſhall now proceed to deſcribe more at large the different methods of extracting this ſalt.

The ſimpleſt and rudeſt preparation of potaſh is called *aſh-balls* in England, and *weed-aſh* in Ireland. It cannot be ſaid properly ſpeaking to be an article of commerce, although a conſiderable quantity is annually made by the peaſantry of both countries, and diſpoſed of among the neighbouring farmers and bleachers. The vegetable from which in England and Scotland this impure alkali is produced, is the common fern or brakes (*Pteris aquilina,* Linn.) Many rough and heathy diſtricts are entirely covered by this plant, which, when it has attained its full growth, about the middle of July, is cut down, and after being half-dried in the open air is gathered into ſmall heaps and kindled. The combuſtion proceeds ſlowly, being accompanied by a ſmothering ſmoke and little or no flame, till the whole is reduced to a reddiſh-grey aſh: this being carefully collected is ſprinkled with a little water, and then moulded by hand into balls three or four inches in diameter, which, when they have acquired a certain ſolidity by drying in the ſun, are ready for ſale. In Ireland, thiſtles, docks, and weeds of all kinds are mixed with the fern, and the aſhes are diſpoſed of in their looſe pulverulent ſtate without any further preparation. According to Dr. Home, fern-aſhes contain about $\frac{1}{9}$ of their weight of ſalt, conſiſting principally of ſulphat and ſubcarbonat of potaſh: 1000 parts of the plant cut in Auguſt and thoroughly dried afford 36.46 of aſhes, from which are obtained by lixiviation 4.5 of ſalt. The common Iriſh weed-aſhes have been analyſed by Mr. Kirwan, and when deprived of their water by a red heat, appear to contain one part of ſalt for 3.5 of aſh; of this the free alkaline portion, however, amounted only to $\frac{1}{21}$ of the whole.

The potaſh of commerce, or *black potaſh*, as it is alſo called, is univerſally procured from the combuſtion of wood; and therefore its preparation can only be undertaken with ſucceſs in thoſe uncleared countries where are vaſt natural foreſts, and where, from the badneſs of the roads, and imperfection of water communication, the value of timber is no more than that of the labour required to fell it. The only diſtricts of Europe in which any conſiderable quantity of potaſh is made, are the mountainous foreſts of Germany, and the extenſive woodland tracts of Poland and Ruſſia. The Britiſh market, however, is principally ſupplied from the United States of North America, a country in which, from its rapid increaſe of population, there is a conſtant demand for cleared land for the purpoſes of agriculture, and therefore, where timber is looked upon rather as an incumbrance than as contributing either to the beauty or value of the ground on which it ſtands.

The American method is to pile up the wood, as ſoon as it is ſufficiently dry to burn, in large heaps, and reduce it as quickly as poſſible to aſhes: theſe aſhes are then put into a wooden ciſtern with a plug at the bottom of one of the ſides, and a quantity of water ſufficient to make a ſtrong lixivium is added; after ſtanding for an hour or two the plug is withdrawn, and the water holding the potaſh in ſolution, runs out, leaving the earthy part ſtill impregnated with alkali in the ciſtern. This ſolution is then evaporated to dryneſs in iron pans and haſtily fuſed into compact reddiſh brown maſſes of ſemi-cauſtic potaſh, in which ſtate it is fit for the market.

In Germany, where the value of wood is greater, and where more intelligence and economy are practiſed in the preparation of potaſh, the general method of proceeding is the ſame as that juſt mentioned, but with ſuch variations, as though ſeemingly of little conſequence, materially augment the produce of alkali. Care is taken to ſelect ſuch kinds of wood as are the richeſt in potaſh, the combuſtion is ſlower, and of courſe the temperature lower, in conſequence of which, but little is loſt by volatilization; the lixiviations alſo of the aſhes are judiciouſly repeated till the whole of the alkali is extracted.

The common Ruſſian potaſh is the impureſt of all, containing nearly one half its weight of earth; and is thus prepared. A large pit is dug, into which are thrown burning brands and the ſmaller extremities of the branches, and when the whole is well kindled, the pit is filled up with logs and other large pieces, which at length, though very ſlowly, are reduced to aſhes. The coarſer part of the aſhes is then ſeparated, by ſifting, from the finer; all the alkali that it contains is procured by lixiviation, and this liquor is mixed with the remainder of the aſhes and wrought into a paſte. A pile is then built of wood, the interſtices of which are filled with this paſte, which being ſet fire to, the whole is reduced to aſhes. This proceſs is repeated ſeveral times till the aſhes begin to clot and become hard; the moſt compact pieces, being then ſelected, are packed up for ſale without any further preparation: the reſt are lixiviated and boiled down to dryneſs in the uſual manner.

Potaſh is converted into a much purer alkaline ſalt, called *pearlaſh*, by calcination: for this purpoſe the potaſh broken into moderately ſmall pieces is ſpread on the floor of a reverberatory furnace, and being then kept red hot, but not melted, for an hour or two, ſtirring it occaſionally with an iron rake, all the carbonaceous and colouring particles are burnt out, and there remains behind a dry, porous, and conſiderably cauſtic ſalt, extremely deliqueſcent, and from its bluiſh white colour, called pearlaſh.

It has been thought of conſequence, in an economical point of view to diſcover the proportion of potaſh afforded by different vegetables, and many analyſes have been made for this purpoſe. They are, however, for the moſt part unſatiſfactory, as they indicate only the proportion of ſoluble ſaline ingredients without diſtinguiſhing the carbonated potaſh from the ſulphat and muriat of potaſh with which it is always mixed. The moſt remarkable and intereſting reſults will be found in the following table; part of which were aſcertained by a committee of the academy of ſciences at Paris and the reſt by the chemiſts whoſe names are ſubjoined: 100 parts of each different ſpecies being previouſly thoroughly dried were burned by an open fire to aſhes, which after being weighed, were accurately lixiviated till all their ſaline contents were extracted.

| 100 Parts. | Aſhes. | Salt. | Salt from 100 parts of aſhes. | Authority. |
|---|---|---|---|---|
| Fumitory - | 21.9 | 7.9 | 36 | Wiegleb |
| Wormwood - | 9.74 | 7.3 | 74.8 | ditto |
| Common nettle | 10.67 | 2.5 | 23.4 | Pertuis |
| Sow thiſtle (Sonchus arvenſis) | 10.5 | 1.96 | 18.6 | ditto |
| Fern - | 5. | 0.62 | 12.5 | ditto |
| Ditto - | 3.64 | 0.42 | 11.6 | Home |
| Stalks of maize | 8.86 | 1.75 | 19.7 | Acad. Sci. |
| ——— ſunflower | 5.72 | 2. | 34.9 | ditto |
| Buckwheat. | | | 33.3 | Vauquelin |
| Vine branches | 3.4 | 0.55 | 16.2 | Acad. Sci. |
| Heath - | | | 11.5 | Wildenheim |
| Foxglove (Digitalis purpurea) | - | - | 33. | Leipſic Econ. Soc. |
| Celandine (Chelidonium majus | - | - | 25. | ditto |
| Nightſhade (Atropa belladonna) | - | - | 27. | ditto |
| Boxwood - | 2.9 | 0.22 | 7.8 | Acad. Sci. |
| Sallow - | 2.8 | 0.28 | 10.2 | |
| Elm - | 2.3 | 0.39 | 16.6 | |
| Oak - | 1.3 | 0.15 | 11.1 | |
| Beech - | 0.58 | 0.12 | 21.9 | |
| Aſpen - | 1.22 | 0.07 | 6.1 | |
| Fir - | 0.34 | 0.04 | 13.2 | |

Upon a curſory inſpection of this table it appears that the ſucculent herbaceous plants afford a prodigiouſly greater proportion both of aſhes and ſalt than the ſhrubby and ligneous ones: it is, however, to be obſerved, that they were all reduced to a ſtate of perfect dryneſs before being weighed, a circumſtance which will in a conſiderable degree account for the apparently greater quantity of ſalt contained in the ſucculent vegetables; for while the different kinds of wood will not loſe more than $\frac{1}{3}$ or even $\frac{1}{5}$ of their weight in drying, fumitory will probably loſe $\frac{9}{10}$ or even more. It is not likely, therefore, that it can ever be worth while to be at the expence of cultivating fumitory and wormwood, as ſome ſpeculators have propoſed, for the ſake of the alkali contained in their aſhes.

The varieties of pot and pearlaſh, which are found in the markets, would no doubt on analyſis afford very different reſults, eſpecially with regard to the proportions of earthy matter, of water, and of carbonic acid; it is not therefore perhaps much to be regretted that we poſſeſs no very accurate analyſis of any of them. The only one on which any reliance can be placed, is of Dantzic pearlaſh by Mr. Kirwan, in which are contained about

| | |
|---|---|
| 60.3 | potaſh |
| 22.4 | carbonic acid |
| 7.2 | water |
| 8.7 | ſulphated potaſh |
| 0.7 | muriated ditto |
| 0.7 | earth |
| 100.0 | |

But if the analyſis of any particular ſample is of little conſequence, generally ſpeaking, yet it is of conſiderable importance both to the manufacturer and chemiſt to be in poſſeſſion of a compendious and accurate mode of aſcertaining the contents of the various kinds of pot and pearlaſh, in order to make advantageous purchaſes of articles, in the intrinſic worth of which there is ſo much difference. Upon the whole perhaps the beſt mode of proceeding on ſuch occaſions is as follows.

1ſt. Prepare a diluted ſulphuric acid, by mixing the concentrated acid, called oil of vitriol, with three times its bulk of diſtilled water. Then teſt it by taking 100 grains of the diluted acid, and adding muriat of barytes as long as any precipitate falls down. The ſulphat of barytes thus prepared, when waſhed with cold water and dried at a low red heat, contains 33.3 per cent. of ſulphuric acid; hence the real acid in any quantity of the diluted acid is readily aſcertained.

2d. Pulverize 500 grains of the alkali under examination, and digeſt it in warm diſtilled or rain-water, adding freſh portions of this fluid as long as any thing is diſſolved. Then put all the ſolutions together, and drop in the teſted ſulphuric acid from a vial containing a known weight of the ſame, till the ſlighteſt poſſible exceſs of acid is indicated by a paper tinged with litmus. After this, heat the liquor to expel all the carbonic acid, and if the liquor changes the colour of turmeric paper, add a few more drops of ſulphuric acid, till it ceaſes to ſhow an exceſs of alkali. Now weigh the vial of ſulphuric acid, and thus aſcertain how much has been expended in ſaturating the alkali, and for every 100 parts of real acid (as previouſly determined by muriat of barytes) thus employed, ſet down 121.2 of pure potaſh. The alkali being the part which gives value to the whole, this is all the examination which in ordinary caſes is required; but if the analyſis is to be carried further,

3d. Take 500 grains more of the alkali, diſſolve it in boiling water, and pour the filtered ſolution into a flaſk; then place the flaſk and a vial containing about three ounces of pure and moderately ſtrong nitric acid into the ſame ſcale of an accurate balance, and equipoiſe them. Afterwards add the acid, drop by drop, to the alkali as long as any efferveſcence takes place, and the loſs of weight indicates the amount of carbonic acid. The ſolution will now probably cryſtallize; a ſufficient quantity of diſtilled water is therefore to be added in order to diſſolve the cryſtals, and nitrat of barytes is to be dropped in as long as any precipitate takes place: 100 parts of the dried ſulphat of barytes, thus procured, indicate 73.6 of ſulphated potaſh. This being removed, add muriat of ſilver to the clear liquor till it ceaſes to be decompoſed: 100 parts of muriated ſilver ſhew 41.34 of muriated potaſh. Thus the ſaline contents are all aſcertained; viz. potaſh, carbonic acid, ſulphat, and muriat of potaſh. The earthy part is ſhown by the inſoluble reſidue.

Having now treated of the impure ſubcarbonats of potaſh, we ſhall conclude this article by an account of the purer ſubcarbonats, and the perfect carbonat of potaſh.

The moſt important of the purer ſubcarbonats is *ſalt of tartar;* which is prepared in the wine countries in large quantities, and is the kind generally uſed in medicine. The lees of wine and the tartar that is depoſited on the ſides of the caſks, are put into ſmall bags about a foot long, and ſubjected to a ſtrong preſſure, in order to ſqueeze out all the wine, which is diſpoſed of to the brandy diſtillers; the contents of the bags being carefully taken out without breaking form maſſes like loaves, which are dried in the ſun, and then piled up in a furnace with alternate ſtrata of charcoal. The fire being kindled and the draft properly regulated, the acid and inflammable matter of the tartar are burnt off without fuſing the alkaline part; when the proceſs therefore is finiſhed, theſe loaves remain of nearly the ſame ſize as before, but very porous and perfectly white. Being then broken into pieces they are diſſolved in hot water, and the clear lixivium being evaporated to dryneſs and calcined to whiteneſs, is ready for ſale; 2½ parts of tartar yield one of ſalt of tartar.

A more expeditious but leſs economical way of procuring ſalt of tartar, is to mix equal parts of crude tartar and nitre, and project the mixture into a red-hot crucible. A rapid deflagration takes place: the nitric acid and the combuſtible parts of the tartar mutually decompoſe each other, and there remains behind the alkaline baſe of each united with ſome carbonic acid. This preparation is called *white flux, nitre fixed by tartar*, *extemporaneous potaſh.*

The perfectly ſaturated carbonat of potaſh has not been known to chemiſts longer than from the time of Bergman. It may be prepared in two ways; the firſt, which was diſcovered by Berthollet, is as follows. Take equal parts of ſalt of tartar and carbonat of ammonia, diſſolve the whole in warm water, pour it into a retort, and proceed to ſlow diſtillation; the potaſh having a ſtronger affinity for carbonic acid than ammonia has, deprives this latter of its acid, and in conſequence ammoniacal vapour is given out in great quantity: when this ceaſes, the contents of the retort are to be poured into a convenient veſſel, where by refrigeration a copious depoſition of cryſtallized carbonat of potaſh will take place.

The other method, and that which is generally practiſed, is to put a ſolution of ſalt of tartar into an apparatus for impregnating water with carbonic acid, and then to throw in this acid till the alkali is quite ſaturated and refuſes to take up any more.

The form of the cryſtals of carbonat of potaſh is that of a tetrahedral rhomboid with dihedral ſummits. This ſalt requires for its ſolution about four parts by weight of cold water, but no more than $\frac{5}{6}$ of its weight of boiling water: a conſiderable degree of cold is produced during its ſolution. It is hardly at all ſoluble in cold alcohol, and requires above 200 parts of this fluid when boiling for its compleat ſolution.

It has been analyſed by both Bergman and Pelletier; each of theſe chemiſts agree in the proportion of alkali, but they differ materially in their eſtimation of the water and carbonic acid.

| Bergman. | Pelletier. | |
|---|---|---|
| 48 | 48 | potaſh |
| 20 | 43 | carbonic acid |
| 32 | 9 | water |
| 100 | 100 | |

The taſte of this ſalt is cool and freſh, with hardly any of the alkaline flavour; on which account, and becauſe it is fully ſaturated with carbonic acid, it is greatly preferable to ſalt of tartar in the compoſition of effervesſcing drafts, and for other medical purpoſes. It is neither efflorefcent nor deliqueſcent in the air. It is decompoſable with abſtraction of the acid by barytes, lime, and ſtrontian, and with abſtraction of the alkali by all the mineral, and by moſt of the vegetable acids.

The uſes of potaſh are innumerable. It is conſumed in the greateſt quantities by ſoap-boilers, bleachers, and glaſs-makers. In the laboratory it is in conſtant and indiſpenſable ſervice.

CARBONAT *of Soda. Kelp. Barilla. Natron.* This ſalt is found to exiſt both in the vegetable and mineral kingdoms of nature. When mineral, it is met with either diſſolved in the water of certain hot ſprings, as thoſe of Carlſbad in Bohemia; or of certain lakes, as the natron-lakes of Egypt and Hungary; or it occurs in the ſtate of a foſſil-ſalt, as in the foſſil natron of Tripoli, called trona. In the vegetable kingdom carbonat of ſoda has been found to exiſt, ready formed, in the Salſola ſoda, and in all probability is contained in all thoſe ſucculent ſaline plants that grow in places impregnated with muriat of ſoda. In order to ſupply the vaſt demands for this alkaline ſalt, it is procured from both the ſources above mentioned, by proceſſes which we ſhall now relate, beginning with the mineral ſoda.

There are two varieties of mineral ſoda, the ſtriated and compact. The ſtriated has been hitherto procured only from Africa. It is found between Tripoli and Fezzan, forming a very thin ſtratum juſt below the ſurface of the ſoil. It is of a ſtriated cryſtalline texture, ſomewhat reſembling fibrous gypſum. It is collected to the annual amount of ſome hundred tons, but ſcarcely ever finds its way to the European markets. It is diſtinguiſhed from common carbonat of ſoda, by being fully ſaturated with carbonic acid, by containing only a ſmall quantity of water of cryſtallization, and by not effloreſcing on expoſure to the air. Its component parts, according to Klaproth, are

| | |
|---|---|
| 37. | ſoda |
| 38. | carbonic acid |
| 22.5 | water |
| 2.5 | ſulphated ſoda |
| 100.0 | |

The compact mineral ſoda is procured in quantity only from Egypt and Hungary. The Egyptian natron lakes, ſix in number, are ſituated in a barren valley, about 30 miles weſtward of the Delta. During three months in the year they are ſupplied with water from copious ſprings, but as they receive no water during the reſt of the year, ſome of the ſmaller and ſhalloweſt ones are generally dried up during the ſummer. The ſoil conſiſts of lime-ſtone mixed with gypſum, and for the moſt part covered over with ſand. The ſalts contained in theſe lakes are muriat and carbonat of ſoda, of which the former is depoſited for the moſt part on the deepeſt ſide, while the latter is formed among the ruſhes that grow in the ſhallower places. The natron appears to be produced by the ſlow mutual decompoſition of the lime-ſtone and common ſalt, aſſiſted by the ruſhes up the ſtems of which the natron riſes by the force of effloreſcence. When the ruſhes thus encruſted are broken by the wind, the ſoda on their ſurface aſſumes its proper quantity of water, and forms a confuſedly cryſtallized ſtratum of the thickneſs of from one to twelve inches according as the weather and other circumſtances are more or leſs favourable. The effloreſcences on the ſhore of the lakes and the detached cryſtals that form at the water's edge are mixed with a much ſmaller quantity of ſalt than the larger maſſes; theſe latter however being more convenient to carry, and being procured with the leaſt trouble, are conſtantly preferred, and as no ſubſequent purification is had recourſe to, the natron of Egypt is by no means ſo valuable as it might eaſily be made. It is chiefly exported to Greece and other parts of Turkey, alſo to Venice, France, and Britain.

The chief natron lakes of Hungary are four in number, ſituated between Dobritzin and Groſwaradin. Theſe, in the winter ſeaſon, when full of water, are from one to two miles in circumference, but by the middle of April or the beginning of May they are generally dried up, except ſome pits that have been ſunk by art below the general level. In a few days after the water has diſappeared, the whole ſurface of the cavity becomes white with ſaline effloreſcences of natron mixed with ſulphat of ſoda; theſe being removed, a freſh incruſtation is formed in three or four days, and continues to be renewed with equal rapidity during the whole dry ſeaſon of the year. A very heavy ſhower is ſufficient to fill the lakes, but in a day or two they are dry again, ſo that no very material interruption is experienced till the latter end of October: by this time the water in the pits is fully ſaturated with natron, a conſiderable proportion of which cryſtallizes during the firſt froſts of winter, and thus terminates the harveſt for the year; for after this the rains ſet in, and the lakes continue full of water till the enſuing ſpring. The Hungarian as well as the Egyptian natron ſeems to be brought into commerce without undergoing any preparation, as it appears in pulverulent maſſes of a dirty grey colour. The Hungarian natron has been analyſed by Lampadius, and the Egyptian by Klaproth, with the following reſults:

| Egyptian. | Hungarian. | |
|---|---|---|
| 32.6 | 14.2 | carbonat of ſoda. |
| 20.8 | 9.2 | ſulphat of ſoda |
| 15. | 22.4 | muriat of ſoda |
| 31.6 | 45. | water |
| | 9.2 | earth |
| 100.0 | 100.0 | |

By far the greater part, however, of the ſoda that is employed, is of vegetable origin, and, like pot-aſh, is procured from the combuſtion of plants. While the vegetables that grow in common ſoil yield pot-aſh, thoſe which flouriſh in ſalt water, or on the ſea-ſhore, or wherever the ſoil is ſtrongly impregnated with ſalt, yield ſoda. Of vegetable ſoda there are two varieties, viz. *barilla* and *kelp*, the former being made from the plants of the genera Salſola, Salicornia, &c. that grow on the ſea-ſhore; the latter being the produce of fuci, and other marine plants.

The beſt barilla (properly bariglia) is made from the ſalſola ſoda, which is an object of ſedulous and extenſive cultivation to the Spaniards on the ſhore of the Mediterranean, eſpecially in the vicinity of Alicant. It is ſown in light low ſoils, that are embanked on the ſide next the ſea, and furniſhed with flood-gates, by which the ſalt water may be occaſionally admitted. In autumn, when the ſeeds are ripe, the crop is cut down and dried; the ſeeds are rubbed out, and the reſt of the plant is burnt in very ſimple furnaces, the temperature of which is juſt high enough to cauſe the aſhes to enter into a ſtate of ſemi-fuſion, and concrete into compact cellular maſſes. The moſt eſteemed variety of this ſalt is called *ſweet barilla;* it is of a greyiſh-blue colour, and is covered over with a ſaline efflореſcence, when expoſed for a time to the air; it is exceedingly hard, and when applied to the tongue diſcovers a ſharp, pungent, alkaline flavour.

*Kelp* is made of what is vulgarly called ſea-weed, or ſea-wrack (whence the French term *ſoude de vareck*), that is, of ſuch of the leafy fuci, principally the *Serratus* and *Veſiculoſus*, as grow on rocks in the ſea, between the high and low water mark. The moſt favourable ſituation for theſe plants is a ſheltered bay, full of calcareous rocks. The ſeaſon for gathering the plants is from May to Auguſt. On the Britiſh coaſts they are cut with a ſcythe, as cloſe to the rock as poſſible, and then bound up into large bundles, which being faſtened to one end of a long rope, the other extremity of it is tied to a boat, and thus the labour of two or three men is capable of towing ſeveral tons weight to the ſhore. Theſe bundles, when landed, are to be opened, and their contents ſpread thinly on the ſhore to dry, turning them from time to time, leſt they ſhould ferment, by which both the quantity and quality of the kelp would be greatly deteriorated. The ware, when dry, ſhould be ſtacked ſecure from rain for a few weeks, till it becomes covered with a white ſaline efflореſcence, and then it is ready to be burnt. The furnace employed for this purpoſe uſed to be, and in many parts ſtill is, nothing but a round pit, three or four feet deep, and ſeven or eight feet acroſs, lined with ſtones; the more ſkilful kelp-burners, however, make uſe of a kiln of the following conſtruction.

It is built of ſtone, in the ſhape of a long open coffer, being 28 inches wide in the clear, about 2½ feet high, and from 8 to 18 feet long. The bottom of the kiln being covered with bruſhwood or heath, a thin ſtratum of the dried ware is ſhaken lightly upon it, and fire is applied to the leeward ſide of the kiln. It muſt now be ſupplied with freſh ware, thrown lightly on, whenever the combuſtion reaches the ſurface: if the weather is perfectly calm, no other precautions are required, than to take care that the fire is not ſtifled, but if it blows ever ſo little, the windward ſide of the kiln muſt be covered with ſods, and even both ſides, if the weather is at all boiſterous. When all the ware has been thrown on that is intended to be uſed at one time, care muſt be taken to cover every ſpot where the fire reaches the ſurface, with a little of the charred or leaſt burnt part. After a time, that part of the maſs which is neareſt to the ſides is ſeen to ſoften or melt, and now begins the moſt critical period of the whole proceſs. An iron bar, previouſly heated, is to be introduced among the ſoft matter, which by this means is to be ſlowly ſtirred up and incorporated, adding by degrees ſome of the leſs burnt portions, and in this manner the whole is to be kneaded together till it becomes a paſty ſemi-fluid maſs. It is a matter of conſiderable dexterity ſo to perform this proceſs as to be able to mix the duſt and fragments of a preceding burning, without too much cooling the whole. If when this incorporation of the materials is begun the maſs is too hard and dry, by waiting a ſhort time, it will be found to have acquired the neceſſary temper, but if it is dry and pulverulent like aſhes, it is expedient to have recourſe to a little common ſalt, which, acting as a flux, will begin the fuſion; or if the heat is very languid, a little pulverized brimſtone may be made uſe of. When the kelp has been thus prepared, and is grown cold, it is broken into large lumps and is fit for ſale. Well made kelp is of a bluiſh-grey colour, ſometimes approaching to green; it has more or leſs of a cellular texture, and contains pieces of charcoal inveloped in the maſs; when breathed on, it emits a faint ſulphureous odour; to the taſte it is cauſtic and alkaline, mixed with the ſavour of common ſalt. It yields eaſily to the knife, but poſſeſſes a conſiderable degree of toughneſs. If dry, it is uſually covered with a white ſaline efflореſcence. The proportion of pure ſoda which it contains varies, according to Kirwan and Jameſon, from 1.25 to 5. per cent.

Pure carbonated ſoda, from whatever ſubſtance, and by whatever means it is procured, is eſſentially the ſame. Its uſual ſtate is that of clear colourleſs cryſtals, in the form of rhomboidal octohedrons, or oblique tetrahedral priſms. To the taſte it is ſweetiſh, cooling, and ſub-alkaline. It is ſoluble in 2½ times its weight of water at 50°, and at a boiling heat diſſolves in its own water of cryſtallization. By expoſure to the air, it effloreſces, and is converted to a white mealy powder, with the loſs of the greateſt part of its water, and this powder, when kept for ſome time at a low red heat, concretes into lumps, loſes a ſmall portion of its carbonic acid, and all its water, and is then called deſiccated ſoda. The component parts of cryſtallized carbonat of ſoda have been variouſly eſtimated, though the difference has not been very great. We ſhall mention the proportions as given by Bergman, and thoſe adhered to by Mr. Kirwan.

| Berg. | Kirw. | |
|---|---|---|
| 22. | 21.58 | ſoda |
| 16. | 14.42 | carbonic acid |
| 62. | 64. | water |
| 100. | 100.00 | |

Soda, however, is capable of combining with a larger proportion of carbonic acid by diſſolving the cryſtallized carbonat in water, and then throwing in carbonic acid gas. The cryſtals that are now depoſited will be found to contain a conſiderably leſs quantity of water, and their ſweetiſh ſub-alkaline flavour will be changed for a cooling ſaline one; ſo that in this ſtate it reſembles the trona. It has not, however, been analyſed with ſuch accuracy as to enable us to ſtate the proportions of its ingredients.

Carbonated ſoda is decompoſed with abſtraction of its baſe by almoſt all the other acids, and with abſtraction of its acid by barytes, lime, ſtrontian, and potaſh.

The purpoſes to which carbonated ſoda is applied are in general the ſame as thoſe for which carbonat of potaſh is uſed; the circumſtances that induce the occaſional preference of one to the other will be mentioned in their proper places.

CARBONAT *of Barytes.* This compound is both found native, and may be procured artificially. For the mineralogical deſcription of the native barytes, ſee WITHERITE; and for the way of procuring the artificial carbonat, ſee BARYTES.

The artificial carbonat appears, from the analyſes of Klaproth and Pelletier, to be compoſed (when dried and ignited for a few minutes at a low red heat) of 22 parts of carbonic acid and 78 of barytes.

The artificial is much more ſoluble than the natural carbonat in all the acids. The muriatic or nitric acids, moderately diluted, diſſolve it with great eaſe and with much efferveſcence. This carbonat is ſcarcely ſoluble in water, but when in fine powder diffuſed through water, and a ſtream of carbonic acid is ſent through it, water then diſſolves (according to Fourcroy) about $\frac{1}{830}$ of its weight; but the carbonat is not cryſtallizable from the ſolution, the exceſs of carbonic acid flying off by expoſure to air or heat, and the carbonat then returning to its pulverulent ſtate.

Carbonat *of Strontian.* This carbonat is found native (ſee Strontianite), and may alſo be readily made by artificial means (ſee Strontian).

Carbonat of ſtrontian, gently dried and ignited, is compoſed, according to Klaproth, of about 30 of carbonic acid, and 70 of ſtrontian. Nearly the ſame obſervations belong to this carbonat as to the carbonat of barytes, but the affinity of the carbonic acid is not ſo ſtrong, and it diſſolves in acids ſomewhat more readily.

Carbonat *of Lime.* Under the article Limestone will be deſcribed moſt of the natural varieties of this very important claſs of minerals; and under Lime the method of freeing them from their carbonic acid, and of analyſis in general.

The pureſt carbonat of lime is prepared by adding carbonated ammonia to a pure nitric or muriatic, or any other ſolution of lime. The precipitation is much aſſiſted by a boiling heat, for this alkali contains ſo much carbonic acid that a part of the lime would be re-diſſolved in this acid unleſs the exceſs be driven off by heat. The white precipitate waſhed thoroughly, and heated in a low red heat for about ten minutes, is then very pure carbonat of lime, containing ſcarcely any water, and no remaining alkali, and conſiſts ſimply of about 45 parts of carbonic acid to 55 of lime.

The carbonats of potaſh or ſoda will alſo have the ſame effect as the carbonat of ammonia, but it is much more difficult to ſeparate entirely every atom of the alkali from the precipitate when the fixed alkalies are uſed than with the volatile, as in the latter caſe the laſt adhering portion is diſſipated by the heat. In conſequence, the carbonat of lime prepared by the ammoniacal carbonat has a dry, looſe, incoherent feel, like powdered ſtarch, which the other has not.

Carbonat of lime is not in any ſenſible degree ſoluble in pure water, but with an exceſs of carbonic acid it diſſolves without difficulty, and hence the lime of lime-water will be precipitated as a carbonat by a ſmall quantity of water holding carbonic acid, and will be re-diſſolved by a larger portion of the ſame, as explained under the article Carbonic *acid.*

The ſolutions of carbonat of lime in water, with exceſs of carbonic acid, change the red colour of Braſil wood to blue, as obſerved by Bergman. But they alſo change litmus-blue to red, on account of the exceſs of carbonic acid.

From the experiments of many accurate analyſts, compared by Kirwan, it appears, that carbonated lime with its own weight of carbonic acid is rendered thereby ſoluble in water, however ſmall the quantity of fluid, but in proportion to the quantity of water leſs carbonic acid will ſuffice.

Carbonat *of Magneſia.* This carbonat is not found native, except largely mixed with ſome kinds of limeſtone, or in ſolution in ſome mineral waters.

The artificial carbonat (the common *magneſia alba* of the ſhops) is prepared by decompoſing ſulphat of magneſia, or Epſom ſalt, by carbonat of potaſh. The following is the common proceſs. Diſſolve a pound of ſulphat of magneſia in five pints of water, add to this a pound of good carbonat of potaſh, diſſolved in a like quantity of water, and boil them for a few minutes. A copious white precipitate is produced immediately, which renders the whole mixture very thick. Strain it, while hot, through linen, and waſh the white maſs left on the ſtrainer repeatedly with boiling water poured on it, till the clear filtered water drops through quite taſteleſs. Then dry the precipitate over a fire, and a white taſteleſs powder is left, which is the common magneſia. The drying of this precipitate is extremely tedious, for being of a very light ſpongy nature, it holds a large quantity of water without dripping, and conſequently the filter ſoon becomes uſeleſs. In the large way the wet maſs is firſt laid on large ſlabs of chalk, which ſuck up much of the moiſture very expeditiouſly.

Common carbonat of magneſia, in its pulverulent ſtate, is exceſſively light, and lies ſo looſe that a ſmaller weight of it will fill a bottle of a given ſize than almoſt any other known powder. It conſiſts of water, carbonic acid, and magneſia, in proportions ſomewhat varying. The quantities of each have been thus eſtimated: by calcination in a full red heat for about half an hour, both the water and the carbonic acid are expelled, and the loſs amounts on an average to about 55 per cent. On the other hand, 100 parts of the ſame carbonat loſe by ſolution in acids only 34 parts, which are carbonic acid, and hence the conſtituents of 100 parts of the carbonat will be 34 of carbonic acid, 21 of water, and 45 of magneſia. The calcination of this carbonat is eaſy, compared to that of lime, and in the proceſs it ſhrinks to a very ſmall bulk, and becomes ſomewhat harſh to the feel. When quite freed from water and carbonic acid, the pure magneſia that remains is the Magnesia *uſta* of the ſhops, which ſee.

The quantity of alkali directed for the decompoſition of the ſulphat of magneſia is ſomewhat more than neceſſary for the purpoſe, ſo that the clear liquor that firſt comes off through the filter is a ſolution of ſulphat of potaſh with carbonat of potaſh.

Another form or ſpecies of carbonat of magneſia is that in which the earth is fully ſaturated with carbonic acid, forming a cryſtallizable ſalt. It is very ſoluble in water, whereas the common pulverulent carbonat of magneſia is abſolutely inſoluble in pure water.

The cryſtallized ſpecies is formed in two ways. It is produced by mixing the ſame materials as the common carbonat, but *without applying heat.* The exceſs of carbonic acid, which the heat drives off, remains in this caſe united with a portion of the magneſia, and if this mixture be left to ſpontaneous evaporation, a quantity of ſmall long four-ſided priſmatic cryſtals may be picked out of the cryſtals of ſulphat of potaſh, which are the cryſtallized carbonat of magneſia. But a neater and better way of preparing them is to paſs a ſtream of carbonic acid through water rendered milky by the common magneſia, which will be ſeen gradually to become clear, owing to the ſolution of the earth in the carbonic acid and water, after which let the ſolution evaporate ſlowly in a warm room. The cryſtals will then form readily, or even if the ſolution is pretty ſtrong, they will depoſit by mere reſt for a time.

This ſalt conſiſts, according to Bergman, of about 25 of magneſia, 50 of carbonic acid, and 25 of water, when analyſed as the former carbonat. It is ſoluble in 48 parts of cold water, but in much leſs when the water alſo has an exceſs of carbonic acid, and hence it is often found during the ſlow evaporation of many of the carbonated mineral waters.

Carbonated magneſia, in any ſtate, is decompoſed by potaſh, ſoda, barytes, lime, and ſtrontian, and alſo by all the ſalts, with the baſis of theſe three earths. Ammonia and magneſia ſeem to have nearly equal affinities for carbonic acid, ſo that either of the two will only partially decompoſe the ſaturated carbonat of the other ſubſtance. Thus, if pure ammonia be added to the cryſtallized magneſian carbonat, the precipitate is not pure magneſia, but the *ſub-carbonat*, or common magneſia; and on the other hand, the ſame ſub-carbonat is produced, if pure magneſia be added to carbonat of ammonia. In either caſe alſo a part of the ammonia unites with the magneſia and carbonic acid, (as Fourcroy has obſerved) forming a triple ſalt, the *ammoniaco-magneſian carbonat*.

Carbonat *of Alumine, Glycine, Zircon*, &c. For the remaining earthy carbonats, ſee the reſpective earths.

Carbonats (*Metallic*). See the reſpective metals.

Carbonat *of Lime*, in *Agriculture*, a term applied to lime in a ſtate of combination with carbonic acid. This ſort of union is frequently met with in nature, and extends to all the ſtony ſubſtances which are diſtinguiſhed under the title *calcareous*, ſuch as lime-ſtone, chalk, marble, &c. In burning or converting theſe ſubſtances into lime, they are deprived of their carbonic acid or fixed air; but on cooling begin to abſorb it again from the ſurrounding atmoſphere. See Lime.

Lime, when in the ſtate of a carbonat, is frequently termed *effete lime*, and may often be employed for the purpoſes of agriculture with much greater benefit than in its cauſtic ſtate, or that of quick-lime.

CARBON-BLANC, in *Geography*, a town of France, in the department of Gironde, and chief place of a canton, in the diſtrict of Bourdeaux. The place contains 1800, and the canton 16,933 inhabitants: the territory comprehends 24½ kiliometres, and 20 communes.

CARBONE, a ſmall river of Spain, which runs into the Guadalquiver, a little above Seville.

CARBONELLI, Steffano, in *Biography*, an Italian performer on the violin, brought into England by the duke of Rutland, about the year 1720. He had been a ſcholar of Corelli, and was ſaid to play much in his manner. His hand was not brilliant, but he had a good tone, and knew muſic well; as a book of 12 ſolos, which he dedicated to his patron, the duke of Rutland, teſtified; the ſix firſt had a double-ſtopped fugue in each, and the reſt had pleaſing melodies in correct and judicious counterpoint; nor were they deſtitute of invention, as far as his ideas and hand could carry him. We have ſeen the book, which would be now difficult to find. It is a folio, engraved on copper.

In 1722, he had a benefit concert at Drury-lane theatre, of which the bill of fare is minutely given in the Daily Courant; (ſee Hiſt. Muſ. iv. 648.) by which we may judge of the muſical dainties of the ſeaſon.

Carbonelli was a ſteady and judicious leader, and, on his arrival in England, was placed at the head of the Opera orcheſtra, where he continued to lead, till 1725, when he reſigned, and was engaged by Mr. Fleetwood at Drury-lane, and there played concertos in the ſecond muſics, and frequently ſolos between the acts. But he reſigned this ſtation when Handel began to perform oratorios, in which he continued to lead as long as their great author ſurvived. Late in life, relinquiſhing muſic as a profeſſion, he entered into the wine trade, and eſtabliſhed a houſe, which ſtill ſubſiſts. He was a man of worth and probity, and honoured with general eſteem for his private virtues as well as his profeſſional talents. While he led the band at Drury-lane, ſir Richard Steel, in his comedy of The Conſcious Lovers, introduced him to play a ſolo for the amuſement of Indiana, taking occaſion in the dialogue, after his departure, to make Bevil jun. pay him and men of talents many compliments. He died in 1772.

CARBONI, in *Geography*, a town of Naples, in the province of Baſilicata; 16 miles S.W. of Turſi.

CARBONIC ACID, Carbonic Acid Gas, or *Fixed Acid.*—Aerial acid.—Mephitic acid.—Kohlenſaure, Germ. —Acide carbonique, Fr. in *Chemiſtry*.

Carbonic acid, in its uncombined ſtate, is only known to us as a gas, and it is the firſt gas in which acid properties were clearly diſcovered. It is known to be ſo by reddening certain vegetable blues, by neutralizing alkalies and alkaline earths, and by being formed by the union of a combuſtible baſe.

The ſources of this acid are immenſe, and widely diffuſed. The chief are the following.

1. The atmoſphere always contains a ſmall portion, which varies in the immediate vicinity of places where the proceſſes of reſpiration and combuſtion are going on, though ſomewhat leſs than might be expected. The general average is eſtimated at about one hundredth part. It is readily extracted from a confined portion of the atmoſphere by the contact of lime or the cauſtic alkalies.

2. Almoſt every natural ſpring, as it riſes from the earth, contains a portion of this air; and ſome waters hold ſo large a portion as to give them, when expoſed to the air, a very briſk, frothy appearance, and a very ſenſible taſte and decidedly acid properties. The celebrated ſprings of Spa, Pyrmont, and Seltzer, are of this kind, and the moſt highly carbonated water of them contains about its own bulk of the gas.

3. Every proceſs in which coal, wood, or any other carbonaceous ſubſtance is burnt, is one which generates this acid gas. The ſame may be ſaid of the proceſs of reſpiration.

4. The vegetation of plants under ſome circumſtances generates carbonic acid.

5. The ſpontaneous decompoſition of vegetable and animal matter produces this gas in abundance; hence fermentation and putrefaction are carbonating proceſſes.

6. But the largeſt ſtore of carbonic acid that exiſts is that enormous quantity which is ſolidified in all the immenſe beds of lime-ſtone, chalk, and calcareous ſtones with which every part of the globe abounds. Many of theſe contain 40 per cent. or even more of their *weight* of this acid.

Carbonic acid gas, or fixed air, has the following properties. It is permanently gaſeous at any temperature or preſſure. It is fatal to animal life, any living creature immerſed in it periſhing as ſoon as it would by total interruption of reſpiration. Hence the ſmall, warm-blooded animals die in it almoſt immediately; dogs, and animals of bulk, ſpeedily become ſenſeleſs in it, but recover, if removed in a ſhort time; frogs, and cold-blooded animals, live in it for a conſiderable time, owing to their power of ſubſiſting for a time without external reſpiration; but when this is paſt they periſh as the warm-blooded animals. This air is equally incapable of maintaining combuſtion, ſo that a candle let down into a jar of it is extinguiſhed as ſoon as it enters the gas as effectually as if dipped into water. Even the admixture of ſo ſmall a proportion as one-ninth of carbonic acid gas renders common air unable to maintain combuſtion, according to Mr. Cavendiſh's experiments. It is the heavieſt of all the known gaſſes, except the ſulphureous. Hence, as ſoon as generated, it falls through the atmoſphere to the loweſt places, unleſs mingled with it by agitation or long ſtanding. Thus, if a jar of fixed air is inverted from ſome little height over a burning taper, enough of it falls unmixed upon the taper to extinguiſh it. The weight of this gas is, in all circumſtances of preſſure and temperature, to that of common air very nearly as three to two; hence its ſpecific gravity will be about .001806, and the weight of a cubic inch at 60° therm. and 29.5 inch bar. will be about .456 of a grain.

This gas alſo combines readily with water and many other ſubſtances, as will be preſently mentioned. Its combinations with the alkalies, earths, and metals, are called *carbonats*.

Carbonic acid gas is procured, for experiment, generally from lime-ſtone, chalk, marble, or any carbonat of lime, either by heat or by the action of an acid, almoſt any of which will diſlodge the carbonic from its baſes, and cauſe it to aſſume a gaſeous form. The mild alkalies may alſo be uſed for this purpoſe. The action of acids always produces an effervescence, or frothing at the ſurfaces of contact, owing to the rapidity with which the carbonic acid takes the form of a gas; and hence all ſtones that effervesce with acids may be preſumed (with but few exceptions), to conſiſt chiefly of carbonat of lime. To obtain carbonic acid gas in quantity and in a regular, uniform ſtream, put a number of ſmall lumps of marble or calcareous ſpar in any proper veſſel, pour on them ſulphuric or rather muriatic acid diluted, and receive the gas as it is generated. If it is collected over water, ſome will be loſt at firſt, owing to the abſorption of a portion by the water itſelf. Or elſe, put ſome dry chalk or marble, or eſpecially carbonat of magneſia, in an earthen retort and heat it to redneſs. The carbonic acid gas then comes off in abundance. When decompoſed by acids, a grain of marble will yield nearly a cubic inch of gas.

As all mixtures under the vinous fermentation, give out an abundance of this gas, this affords a ready way for procuring it, and ſubſtances under experiment may be immerſed in an atmoſphere of the gas by being ſimply ſuſpended over the fermenting vats of brewhouſes.

Carbonic acid gas is readily abſorbed by water; and thus the natural carbonated waters may be eaſily imitated. This fluid has a pungent, agreeable, briſk taſte, and bubbles vigorouſly, when expoſed to air, the more in proportion to the temperature. This abſorption is ſhewn in a very eaſy manner, ſimply by filling a phial with water, then diſplacing about half its contents, by throwing up the gas, and then preſſing the finger cloſe againſt the mouth, ſhaking the half-full bottle violently. It will then abſorb ſo much of the gas as to make nearly a vacuum within, which will be felt by a ſtrong external preſſure of the atmoſphere on the finger that ſhuts the communication. This abſorption is alſo equally promoted by ſubjecting the gas to ſtrong preſſure, when in contact with the water that is to abſorb it; and it is by the united action of preſſure and agitation that the manufacture of the carbonated medicinal waters (ſuch as the artificial Seltzer, and the like), is carried to ſuch great perfection.

Water, at about 50° temperature, will abſorb, by mere agitation, nearly its own bulk of carbonic acid gas; but by the combined action of preſſure and agitation, three times as much may be thrown in.

Mr. William Henry, in his valuable experiments on the abſorption of gaſſes by water, (Phil. Tranſ. for 1803,) has ſhewn that the quantity of gas abſorbed is (*ceteris paribus*), regulated by the purity of the gas; for, even if the gas itſelf is obtained unmixed with any other, ſome addition of atmoſpherical air muſt take place from the veſſels in which the experiment is made, and alſo from the water, which cannot be abſolutely purged of common air by boiling or any other method. Hence Mr. Henry found, that if 20 meaſures of nearly pure carbonic acid gas were agitated with 10 meaſures of water, full 10 meaſures of the gas would be abſorbed; but if 20 of the gas, mixed with 10 of common air, were agitated with the ſame quantity of water, only ſix meaſures could be taken up. Water alſo parts with a great proportion of its carbonic acid by mere expoſure to air, which independent of the circumſtance of removing the mechanical preſſure of corks, &c.; for Dr. Brownrigg found that the gas would not eſcape from Seltzer water, when in a cloſe bottle, though a looſe empty bladder ſupplied the place of a cork, and in which, therefore, the gas had ample room to expand itſelf; but a free communication with the air was neceſſary for this eſcape. The abſorption of the gas is inverſely as the temperature of the water; cold water abſorbing much more than warm. The diminution of abſorption, on raiſing the heat, Mr. Henry eſtimates at about $\frac{1}{14}$th of the whole for every ten degrees above 55°. With regard to the effect of preſſure, it appears that water, in all caſes, takes up as great a bulk of condenſed as of expanded gas, under ſimilar circumſtances of temperature.

Therefore, as the bulk of all aeriform bodies is inverſely as the preſſure to which they are expoſed, the quantity abſorbed is directly as the preſſure; that is, for example, if a preſſure of 30 inches of mercury will cauſe a certain bulk of carbonic acid to be abſorbed, a preſſure of 60 inches will cauſe a double abſorption.

The ſpecific gravity of water, holding its own bulk of carbonic acid, is about 1.0015. This gas is readily and almoſt totally again expelled by heat; hence, in the analyſis of mineral waters, the firſt ſtep to be in general purſued is the expulſion of the gaſſes which it may contain, by boiling for about ten or fifteen minutes.

Carbonated water ſhews its acid properties by changing the colour of litmus from blue to red. This it will do, according to Bergman, when the water contains as much as $\frac{1}{16}$th of its bulk of the gas. It is very conveniently ſhewn, in the way mentioned by Kirwan, that is, by adding, in a thin glaſs tube, or jar, about equal quantities of the carbonated water, and of litmus infuſion diluted, ſo that the blue is juſt diſtinguiſhable. The colour then becomes of a very dilute red, and is better remarked when compared with a ſimilar glaſs tube full of the ſame dilute litmus liquor and plain water. To ſhew that it is the carbonic and no other acid that produces this change, let ſome of the carbonated water be boiled ſtrongly for a few minutes, and then it will leave the blue unaltered.

But lime-water is a much more delicate teſt for carbonic acid, either gaſeous or liquid. When a gas is to be tried, nothing more is required than to ſhake it with lime-water, or with barytic or ſtrontian water, and the immediate mildneſs of the water will indicate the preſence of carbonic acid gas in almoſt every caſe.

But with liquid carbonated water, it ſhould be remembered, that though the firſt portion of carbonic acid will precipitate the lime from its ſolution in the form of white carbonat of lime or chalk, a greater portion of the acid will re-diſſolve the *carbonat of lime*. So that if a highly carbonated water and lime-water be mixed together at repeated portions, the mixture will firſt become turbid by the ſeparation of the carbonat of lime; then an additional quantity of carbonated water will make it again clear by re-diſſolving the carbonat; after which another portion of lime-water will again make it turbid, and freſh carbonated water again clear, and ſo on, in proportion to the mutual ſaturation and ſuperſaturation of the two ingredients. Therefore, as no error can ariſe from an exceſs of lime-water, the latter, to ſhew, in all caſes, the preſence of carbonic acid, ſhould be in equal quantity with the carbonated water. According to Bergman's valuable reſearches on carbonic (called by him *aerial*) acid, lime-water will detect by its cloudineſs as little as one cubic inch of the gas in 7000 grains of water, that is, where the weight of the gas is only $\frac{1}{14000}$th of the whole.

This gas is alſo readily and totally abſorbed from any gaſeous mixture by ſlight agitation with a ſolution of cauſtic or nearly cauſtic alkali. A much ſmaller quantity of alkaline ſolution will ſuffice than of lime-water, as the former may be made much more concentrated. This is often convenient; but it is not ſo palpable a teſt, as no cloudineſs or change of appearance in the alkaline ſolution enſues.

Carbonic acid, according to the modern ſyſtem of nomenclature, ſignifies an acid whoſe baſis is carbon; and hence that it is produced by the combuſtion or oxygenation of carbon or pure charcoal. It required the united efforts of many of the moſt eminent chemiſts to elucidate the nature of this important acid, and to ſhew that the very ſame ſubſtance which exiſted as a large component part of all calcareous ſtones, and was given off abundantly by many of the natural mineral waters, was alſo the ſole product of the combuſtion of charcoal, and all carbonaceous matters. The full diſcovery and proof of this fact are due to Lavoiſier, who made the elementary experiment of burning a given weight of charcoal in oxygen gas of known purity, (no other ſubſtance being introduced than a very minute portion of phoſphorus to begin the combuſtion,) and found the product of the combuſtion to be this acid gas, the weight of which, when removed by cauſtic alkali, correſponded very exactly with the loſs of charcoal and oxygen. Very little actual diminution of bulk takes place at firſt in this combuſtion, ſince the product is itſelf a gas, and not a liquid, as happens after the combuſtion of ſulphur, phoſphorus, &c. and therefore it is not till cauſtic alkali or lime-water is introduced that the production of the carbonic acid, and conſequent loſs of oxygen, are made apparent. From this elementary experiment, Lavoiſier infers, that carbonic acid is compoſed of about 28, by weight, of charcoal, and 72 of oxygen, and the reſults of ſubſequent inquiries nearly, if not abſolutely, confirm the accuracy of this ſtatement.

Carbonic acid is at its higheſt ſtate of oxygenation, and is the only ſtate in which it has acid properties. United with leſs oxygen it forms the *carbonous oxyd* as noticed in the laſt article, in which, alſo, the partial diſoxygenation of carbonic acid and conſequent production of the carbonous oxyd are deſcribed.

Carbonic acid has been *completely* diſoxygenated (that is, reduced to black pulverulent charcoal) by only one ſubſtance, namely, by phoſphorus. This diſcovery was made by Mr. Tennant, and was followed by other valuable experiments by Dr. Pearſon. (Phil. Tranſ. for 1791-2.)

From the well known fact that phoſphorus cannot be made by diſtilling phoſphat of lime and charcoal, the latter not having the power of decompoſing this acid when united with lime, Mr. T. inferred that the united actions of phoſphorus and lime might be ſufficient to decompoſe carbonic acid by a ſtronger affinity with its oxygen. He accordingly put ſome phoſphorus into a coated glaſs tube cloſed at one end, and over the phoſphorus ſome powdered marble. The open end of the tube was then alſo cloſed, except a very ſmall aperture, to prevent the free acceſs of the external air, and the tube was then heated red hot for a few minutes. When cold and broken it was found to contain a black powder conſiſting of true charcoal mixed with both phoſphat and phoſphuret of lime, together with ſome undecompoſed marble. In this experiment the only ſource of the black carbonaceous powder can be the carbonic acid of the marble, which appears to have been decompoſed by complicated affinities, namely by that of part of the phoſphorus for the oxygen of the carbonic acid, of the reſt of the phoſphorus for the lime forming the phoſphuret of lime, and alſo by the phoſphoric acid (as ſoon as formed) for another portion of the lime forming the phoſphat of lime. Or, in other words, the carbonat of lime muſt undergo two diſuniting proceſſes before the charcoal can be produced, namely, the carbonic acid muſt be ſeparated from the lime to which it has a certain affinity, and alſo the oxygen of the carbonic acid muſt be ſeparated from the carbon which is its baſe. The lime is detached from its union with the carbonic acid by the united affinities of part of the phoſphorus for lime, and alſo of the phoſphoric acid, when formed, for the lime. On the other hand, the carbonic acid is decompoſed by the direct affinity of phoſphorus for oxygen, which is great, but however of itſelf leſs than that of carbon for oxygen, ſince, in the common diſtillation of phoſphorus, it is produced by decompoſing phoſphoric acid with charcoal. Therefore the decompoſition of carbonic acid here produced is the reſult of combined affinities, and could only be effected in this manner.

Dr. Pearſon decompoſed carbonic acid by a ſimilar proceſs, but with phoſphorus and carbonat of ſoda inſtead of carbonat of lime. Sufficient quantity of the black powder was procured in both caſes to prove that it was genuine charcoal, and yielded carbonic acid again on combuſtion with nitre.

Many liquids abſorb carbonic acid with apparently as much eaſe as water, ſuch as alcohol, oil, &c. but ſuch mixtures ſeem to produce no remarkable chemical change.

The affinity of carbonic acid with the alkalies, earths, and metals, is ſo weak that it may be diſplaced by every other acid, the boracic excepted. This weakneſs of affinity is doubtleſs much owing to the tendency which it has to aſſume a gaſeous form as ſoon as diſengaged.

The order of the affinities of this acid in the liquid way for the alkalies and earths is barytes, ſtrontian, lime, potaſh, ſoda, magneſia, and ammonia. With regard to the two latter indeed, the force of affinity is ſo nearly balanced that each ſubſtance will partially decompoſe the carbonat of the other according to the temperature. Thus at a higher heat the ammonia, from its increaſed tendency to volatilization, loſes much of its force of affinity with ſolid or liquid baſes, and then its carbonat is decompoſed by magneſia, which no heat can volatilize; but in a low temperature the affinity of the ammonia prevails and it decompoſes the magneſian carbonat, though very imperfectly.

As the carbonic acid quits every ſubſtance in a high heat its relative affinities in the dry way cannot be aſcertained.

Carbonic *acid*, in *Agriculture*, an acid that abounds in nature, and is moſtly found in the form of an aeriform fluid, or gas. See Carbonic *acid*.

The author of the "Philoſophy of Gardening" remarks, "that when vegetable ſubſtances are decompoſed by fermentation, there is a quick union of oxygen and carbon; and this carbonic acid gas, called formerly fixed air, riſes up in vapour, and flies away. But where this proceſs goes on more ſlowly, as in a dunghill lately turned over, or in black garden mould lately turned over and thus expoſed to the air; much of which remains in the cells, or cavities of the hot-bed, or border, this carbonic acid is ſlowly produced, and is abſorbed by vegetable roots, he ſuppoſes, in its fluid ſtate, or diſſolved in water before it acquires ſo much heat as to riſe in the atmoſphere in the form of gas." This carbonic gas, in its fluid ſtate, or diſſolved in water, not in its aerial or gaſeous ſtate, is, he conceives, the principal food of plants; becauſe their ſolid fibres conſiſt principally of carbon, and their fluids of water, as is evident from their analyſis.

Carbonic *earth*, or *ſoil*, that ſort of earth, or ſoil, in which there is a conſiderable portion of decayed vegetable matter. Boggy and other wet kinds of lands, where any coarſe vegetable productions have been ſuffered annually to become putrid, are moſtly of this kind; and likewiſe ſuch grounds as have been much enriched by manures, ſuch as thoſe of old gardens. The ſurface ſtratum of lands in general partakes of this nature. See Carbon

CARBONNE, in *Geography*, a town of France, in the department of the Upper Garonne, and chief place of a canton, in the diſtrict of Muret; 7 leagues S. of Toulouſe. The place contains 1825, and the canton 8676 inhabitants; the territory comprehends 202½ kiliometres, and 13 communes.

CARBU, a town of Italy, in the ſtate of Genoa, ſeven miles W.N.W. of Finale.

CARBULA, or Carbulo, in *Ancient Geography*, a town of Spain, in the department of Corduba, according to Pliny.

CARBUNCLE, in *Heraldry*, a charge, or bearing, conſiſting of eight radii, or ſpokes; four whereof make a common croſs, and the other four a ſaltier. Some call theſe radii *battons*, or *ſtaves;* becauſe round, and enriched with buttons, or pearled, like pilgrims' ſtaves; and frequently tipped, or terminated with fleurs-de-lys. Others blazon them, royal ſceptres placed, in ſaltier, pale and feſſe.

Carbuncle, in *Mineralogy*. See Spinell.

Carbuncle, *Carbunculus*, alſo denotes a ſort of ſandy matter found in Hetruria, formed of a hard earth of the ſame name, concocted in the viſcera of the mountains, by the heat of the ſubterranean vapours.

Pliny and Varro ſpeak of the carbunculus, as a peculiar kind of hot, dry, lean ſoil.

Carbuncle, in *Surgery*, a roundiſh, hard, livid, and painful tumour, quickly tending to mortification, and (when it is malignant) connected with extreme debility of the conſtitution. See Anthrax. When this complaint is ſymptomatic of the plague, a peſtilential bubo uſually attends it. See Plague. The carbuncle is ſeated deeply, in parts provided with cellular membrane; and therefore does not ſoon diſcover its whole dimenſions, nor the ill digeſted matter it contains. As this tumour is commonly a ſymptom of depraved health, our chief attention ſhould be directed to the re-eſtabliſhment of the patient's ſtrength, rather than to the local treatment of the carbuncle. See the directions given under the article Gangrene, which will generally apply to the caſe in queſtion.

Bleeding, purging, and other antiphlogiſtic means can very ſeldom be admiſſible in the treatment of carbuncles; but, on the contrary, we ſhould ſupport the patient's ſtrength by powerful tonics, fermented liquors, country air, and anti-putreſcent vegetables; while the tumour itſelf may be poulticed, and fomented with anodyne decoctions, till it be fit to be opened by the lancet.

CARBUNCULATION, the blaſting, or ſcorching of the new-ſprouted buds of trees, or plants, either by exceſſive heat, or exceſſive cold.

It happens chiefly in the ſpring and autumnal ſeaſons, when vegetables being covered with dewy vapours, a ſudden cold comes on them, which congealing thoſe vapours, the nutritious juice of the plant is coagulated, and the texture of its fibres deſtroyed.

CARBUNCULUS, in *Ornithology*, eſcarboucle, and carbuncle humming-bird. See Trochilus Carbunculus.

CARBURET, in *Chemiſtry*, is a combination of charcoal with any other ſubſtance. Thus, *carburetted hydrogen* is hydrogen holding carbon in ſolution. The only other carburets hitherto certainly known are, *carburetted ſulphur*, *carburetted iron*, and *carburetted copper*.

CARCA, in *Ancient Geography*, a town of Spain, placed by Ptolemy in the interior of the country, inhabited by the Baſtitani.

CARCAJOU, in *Zoology*, the name of an animal of the badger kind, ſaid to be firſt deſcribed by M. Saraſſin in Hiſt. Acad. Soc. 1713: he ſpeaks of it as a ſmall quadruped, but very ſtrong and furious. This is the *carcajou* of Buffon, *American badger* of Pennant, and ursus *Labradorius* of Linnæus and Schreber, being found chiefly in the Labradore country, North America.

CARCAMOUSSE, in *Military Language*, a ram, a large wooden machine, having one end fortified and covered with iron, which the ancients made uſe of at ſieges for battering walls. It is alſo the name of a large machine of wood, uſed at preſent for driving piles into the ground. Under Charles the Simple, this name of carcamouſſe was given to the ram.

CARCANO, John Baptist, in *Biography*, born at Milan in 1538, was a favoured diſciple, and inmate of Fallopius, and profited ſo well by his inſtructions, as to be thought worthy of being coadjutor to that great anatomiſt, when he was only three or four and twenty years of age. On the death of Fallopius in 1563, Carcano was invited to Pavia, where he lectured with great applauſe. In the courſe of his diſſections, he diſcovered ſeveral errors in the deſcription of the heart and other parts of the body in the works of the old anatomiſts, which neither Veſalius nor Fallopius had detected. His works are, "Libri duo Anatomici; in altero de cordis vaſorum in fœtu unione pertractatur, in altero de muſculis palpebrarum atque oculorum motibus deſervientibus accuratè diſſeritur," Ticini, 1574, 8vo. In the firſt there are accurate deſcriptions of the foramen ovale, ſo called ſince from his account of it, and of the ductus arterioſus, which had been omitted, or erroneouſly deſcribed by Veſalius and Fallopius. In the ſecond he deſcribes the muſcles of the eyes and eye-lids, and the puncta lacrymalia, correcting here alſo ſome errors into which his maſter and former anatomiſts had fallen. "De Vulneribus Capitis," Mediol. 1584, 4to. In this work the author has collected all that was worthy notice on the ſubject in earlier writers, and added much from his own practice. "Exenteratio Cadaveris illuſt. Cardinalis Borromæi," 1584, 4to. Douglas Bibliog. Haller Bib. Anat. et Chirurg.

Carcano, Achilles, born at Milan in 1556, received the rudiments of his education under his father, an eminent ſurgeon in that city. He was afterwards admitted of the univerſity, and having taken his degree of doctor in medicine, went to Pavia, where he was engaged in teaching the practice of medicine. He died at Milan in 1588. His only work is an edition of the aphoriſms of Hippocrates, digeſted under proper heads, with practical obſervations, printed 1581, 8vo. Ticini. Haller Bib. Med.

CARCANOSSI, in *Geography*, a province of Madagaſcar to the ſouth of the river Metanengha.

CARCANTIA, in *Ancient Geography*, a place of Italy in Inſubria, on the route of the Gauls in their paſſage over the Cottian Alps. Anton. Itin.

CARCAPULI, in *Botany*, Bauh. hiſt. 1. p. 137. Rai. hiſt. 1661. *Cambogia gutta*. See Gamboge and Garcinia.

CARCAR, in *Geography*, a town of Spain, in Arragon, on the Ega; 3 leagues from Calahorra.

CARCARA, a town of Italy, in the duchy of Montferrat, on the river Bormia; 12 miles E. of Ceva.

CARCARAN, or Carcaravat, a river of South America, in Paraguay, which diſcharges itſelf into La Plata.

CARCARIAS Canis, in *Ichthyology*, a ſynonymous name of one or two different ſpecies of the ſhark tribe among old writers; ſometimes applied to squalus *galeus*.

CARCARIOLA, in *Geography*, a town of Naples, in the province of Abruzzo Citra; 22 miles W. of Aquila.

CARCASE, the corpſe, or body of a dead animal. The carcaſe of a fowl, capon, partridge, leveret, rabbet, &c. is what remains thereof, after the four members, or limbs, viz. the legs and wings, have been cut off.

CARCASE, in *Architecture*, is the ſhell or ribs of a houſe; containing the partitions, floors, rafters, &c. made by the carpenter, &c. The carcaſe is otherwiſe called the FRAMING.

CARCASO, in *Ancient Geography*, now *Carcaſſone*, a town of Gallia Narbonnenſis, belonging to the Volſci Tectoſagi, according to Pliny. Cæſar, in the third book of his "Bell. Gall." ſays, that this town furniſhed him with troops at the time of his war in Gaul.

CARCASS, in French CARCASSE, in *War*, is ſometimes a hollow caſe formed of ribs of iron, and covered over with pitched cloth, &c. about the ſize of a ſhell; and ſometimes is entirely of iron, like a ſhell with two, three, or four holes in it for the fire to blaze through. Carcaſſes are filled with various matters and combuſtibles for the purpoſe of ſetting fire to houſes when thrown out of mortars. They were formerly of an oval form, made of iron bars, and filled with a compoſition of mealed powder, ſaltpetre, ſulphur, broken glaſs, horn-ſhavings, pitch, turpentine, tallow, and linſeed oil, covered with a pitched cloth. They were primed with mealed powder and quick match. The flights, however, of the oblong ones were ſo erroneous and uncertain, that they have been totally laid aſide; and none but the round ones are uſed at preſent. The following is nearly the manner of preparing them.

Boil 12 or 15 lb. of pitch in a glazed earthen pot, or veſſel; mix with that 3 lb. of tallow, 30 lb. of powder, 6 lb. of ſaltpetre, and as many ſtopins as can be put in. Fill the carcaſs before the compoſition is cold, to do which, ſmear your hands with oil, or tallow, and fill the carcaſs one third full with the ſaid compoſition. Then put in loaded pieces of muſquet or piſtol barrels, or loaded grenades, filling up the intervals between theſe with part of this compoſition, and cover the whole over with coarſe cloth well ſewed together, keeping it as nearly as poſſible in a round or globular figure. Then put it into the carcaſs, having a hollow top and bottom with bars running between them to hold them together, and compoſed of four ſlips of iron joined at top, and fixed at the bottom at equal diſtances to a piece of iron, which together with the hoops, when filled, form a complete globular body. When it is quite finiſhed, and cold, it muſt be ſteeped in melted pitch, and then inſtantly immerſed in cold water. Laſtly, bore three or four holes at top, and fill them with fuze-compoſition, covering them with pitch until the carcaſs is going to be uſed. Carcaſſes are thrown out of mortars, and weigh from 50 to 230 lb. according to the mortars employed for throwing them. A carcaſs for the ſea-ſervice differs from a common ſhell of the ſame ſize only in the compoſition it is filled with, and the four holes in it, from or through which it burns or blazes when fired.

The following is a Table of experiments that were made with round caſe carcaſſes at an elevation of 45°.

|  | Nature or ſize of mortar. | Weight of the carcaſs. |  | Quantity of powder. |  | Time of flight in ſeconds. | Time of burning in minutes and ſeconds. |  | Length of priming. | Range. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. |  | lb. | oz. | lb. | oz. | ſec. | min. | ſec | inches. | feet. |  |
| 1 | 10 | 62 | 13 | 0 | 8 | 6 | 3 | 0 | $2\frac{7}{10}$ | 390 | Burnt well in general. Fired from 7 to 9 o'clock in the morning. There was a good light. |
| 2 | 10 | 64 | 12 | 0 | 12 | 8 | 3 | 12 | $2\frac{7}{10}$ | 774 |  |
| 3 | 10 | 70 | 0 | 1 | 0 | 10 | 3 | 40 | $2\frac{7}{10}$ | 882 |  |
| 4 | 10 | 71 | 12 | 1 | 4 | $11\frac{1}{2}$ | 4 | 0 | $2\frac{7}{10}$ | 1332 | Fired from 2 to 4 o'clock in the morning. It was very dark. Gave a very good light. |
| 5 | 10 | 72 | 0 | 1 | 12 | 13 | 4 | 18 | $2\frac{7}{10}$ | 1815 |  |
| 6 | 10 | 68 | 10 | 2 | 0 | 14 | 4 | 45 | $2\frac{7}{10}$ | 2043 |  |
| 7 | 8 | 33 | 7 | 0 | 6 | 6 | 3 | 4 | $2\frac{7}{10}$ | 411 | Fired from 10 o'clock at night to 2 in the morning. Had a very good effect. |
| 8 | 8 | 36 | 12 | 0 | 10 | 8 | 3 | 20 | $2\frac{7}{10}$ | 963 |  |
| 9 | 8 | 35 | 8 | 0 | 14 | 12 | 5 | 0 | $2\frac{7}{10}$ | 1344 |  |
| 10 | 8 | 34 | 14 | 1 | 0 | 14 | 3 | 40 | $2\frac{7}{10}$ | 1680 |  |
| 11 | 8 | 32 | 12 | 1 | 4 | 13 | 5 | 10 | $2\frac{7}{10}$ | 1908 |  |

The following is a Table of experiments made with thirteen inch round iron carcaſſes fired from a thirteen inch ſea-ſervice mortar at Woolwich in 1773.

| Empty. |  |  | Full. |  |  | Powder. |  | Elevation. |  | Range. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| cwt. | qr. | lb. | cwt. | qr. | lb. | lb. | oz. | deg. | min. | feet. |  |
| 1 | 2 | 27 | 1 | 3 | 12 | 30 | 0 | 45 | 0 | 8700 | One ſmall piece burſt from the carcaſs and fell at the diſtance of 4500 feet; the other piece contained the compoſition. The two laſt did not break. |
| 1 | 3 | 1 | 1 | 3 | 14 | 30 | 0 | 41 | 0 | 9000 |  |
| 1 | 3 | 3 | 1 | 3 | 6 | 30 | 0 | 42 | 0 | 10200 |  |
| 1 | 1 | 4 | 1 | 3 | 17 | 30 | 0 | 42 | 30 | 10500 |  |

Carcaſſes, it is ſaid, were firſt made uſe of by the biſhop of Munſter at the ſiege of Groll, in 1672, where the duke of Luxemburg commanded.

CARCASSEN, in *Geography*, a town of Spain in Valentia, ſeated in the valley of Xucar.

CARCASSONE, anciently *Carcaſo*, a town of France, and principal place of a diſtrict in the department of the Aude, formerly the capital of a county called Carcaſſez, and before the revolution the reſidence of a governor, and the ſee of a biſhop, ſuffragan of Narbonne. It is divided by the river Aude into the upper and lower town, both of which are encompaſſed by a wall. The former is ſituate on an eminence, and has a caſtle which commands the whole town, and an ancient cathedral. The lower town is more conſiderable, and is regularly built in the form of a large ſquare. Its ſtreets are ſtraight, and interſect one another at right angles, and they lead to a large ſquare in the centre, where is a fountain formed of rock-work, and having on the top of it a figure of Neptune. The quays are ornamented with rows of trees, which form agreeable walks. The town has a conſiderable manufacture of cloth; and the adjacent country, which is mountainous, abounds with olive-trees and vines, and affords a fine marble, called "the marble of Languedoc." Carcaſſone ſuffered very much on occaſion of the cruſade that was undertaken againſt the ALBIGENSES in the beginning of the 13th century; and after having been inveſted by Simon de Montfort, who directed and commanded the military operations of the church, A.D. 1209, was allowed to capitulate on condition that the inhabitants ſhould evacuate it in a ſtate of nudity; nor was Agnes the viſcounteſs, though young and beautiful, exempted from this ignominious and ſhocking puniſhment.

The place is ſaid to contain 15,219, and the canton 18,516 inhabitants; the territory includes 142½ kiliometres and 8 communes. It is 12 leagues W. from Narbonne, 19 S.E. from Touloufe, 15 N.E. from Foix, and 160 S. from Paris. N. lat. 43° 11′. E. long. 2° 25′.

CARCATHIOCERTA, in *Ancient Geography*, a town of Aſia, in Greater Armenia, near the Tigris, according to Pliny. It was a royal city of the country called "Sophena," according to Strabo.

CARCATTY, in *Geography*, a town of the iſland of Ceylon; 35 miles N.W. of Trincomaly.

CARCAVEE, a town of Iſtria; 5 miles S.S.W. of Capo d'Iſtria.

CARCAVELOS, a village of Portugal in the vicinity of Liſbon, between which and the town of Oeyras is produced the ſweet wine, called in England Liſbon, in Germany Portugieſwein, and in the country itſelf wine of Carcavelos. The vineyards are incloſed in quintas, on a gentle declivity towards the ſea, and the muſt is generally ſent to Liſbon, where it is made into wine. This wine which is generally white, and beſt of that colour, is drank in the country in great perfection, nor can the adulterated liquor ſold in foreign countries under that name be compared to it.

CARCAVI, PETER DE, in *Biography*, was born at Lyons, and became counſellor to the parliament at Toulouſe. He was the friend of Fermat, who at his death left to him the care of his writings; and after the death of Merſennus he correſponded with Des Cartes, with whom he became acquainted in 1646. At the time of his correſpondence, or about 1649, he was ſettled at Paris, where he became counſellor to the grand council, and keeper of the king's library till the death of M. Colbert. He was alſo the particular friend of Paſcal and Roberval. Interfering with ſome warmth in the diſpute that took place between the laſt of theſe mathematicians and Des Cartes, the correſpondence between him and Des Cartes was broken off. He was diſtinguiſhed by his *great* knowledge of books, antiquities, and medals. On the eſtabliſhment of the French Academy in 1666, he was appointed geometer. He died at Paris in 1684. Gen. Biog.

CARCERES, in *Antiquity*, were the liſts, or barriers of the circus, within which the horſes were confined, till the ſignal was given by the magiſtrate for ſtarting.

The word is Latin, ſuppoſed to be formed *a coercendo*, as they ſerved as a reſtraint to the horſes ready to run. In the olympic games a ſtretched cord, called "balbis" ſerved this purpoſe. Livy ſays, that the Romans diſuſed the balbis of the Greeks, A. U. C. 425, and conſtructed carceres in their room.

The number of carceres was twelve. In the early days of Rome they were made of wood, which Claudius afterwards changed for marble. They were kept faſt with bolts, ſuſtained by ropes, which, the moment the ſignal was given, flew open all at once. Some think that only four were uſed at a time. Suet. in Claud. cap. xxii. n. 6. See CIRCUS *maximus*.

CARCHA, in *Ancient Geography*, *Kark* or *Eſki-Bagdad*, a town of Aſia, in Aſſyria, ſeated on the eaſtern bank of the Tigris, about 50 leagues S. of Niniveh, and 25 N. of Bagdad.

CARCHEMISH, or CARCAMIS, a town of Aſia, ſeated on the Euphrates and belonging to the Aſſyrians. Whilſt the Aſſyrians were defending themſelves againſt the Scythians, who had conquered the whole of Upper Aſia, Pharaoh-Necho, king of Egypt, laid hold of this favourable opportunity for recovering the city, which was then ſubject to the king of Aſſyria. The garriſon, which he left in it, was cut in pieces by Nebuchadnezzar in the fourth year of Jehoiakim, B. C. 606 (2 Chron. xxxv. 20. 2 Kings xxiii. 29.). Carchemiſh is probably the *Cercuſium*, *Circeſium*, or *Circeium* of profane authors, ſeated in the angle formed by the junction of the Chaboras or Chebar with the Euphrates.

CARCHERD, in *Geography*, a town of Perſia, in the province of Choraſan; 45 miles N.W. of Herat.

CARCHI, in *Ancient Geography*, a people of Aſia in Media, according to Polybius.

CARCHI, in *Geography*, a ſmall fertile iſland in the Mediterranean ſea, near that of Rhodes.

CARCICIS *portus*, in *Ancient Geography*, *Caſſis*, a port of Galiia Viennenſis, nearly S. E. of Marſeilles, and N. W. of *Cithariſtæ portus*.

CARCINA, or CARCINES, a navigable river of Italy, in the country of the Brutii, between the promontories *Cocinthium* and *Lacinium*, according to Pliny.

CARCINE, or CARCINITIS, the name of a town nearly W. of the iſthmus which joins the Crimea to the continent, at the mouth of the ſmall river Calanza.

CARCINITIS *Sinus*, a gulf of the Euxine ſea, between the Tauric Cherſoneſus and Scythia. Strabo calls it *Tamyragus* and *Carcinites*. It was afterwards called Necro-Pyla.

CARCINIUM *Opalinum*, in *Zoology*. See DAGYSA.

CARCINOMA, in *Surgery*, the ſame as a *cancer*, which was named καρκίνωμα by the Greeks, from καρκίνος a crab, and νεμω I gnaw or corrode; hence comes the word *carcinomatous* or *cancerous*. See CANCER.

CARCINUM, in *Ancient Geography*, a town of Italy in Brutium, probably the ſame with "Carcinus," placed by Pomponius Mela in the gulf of Squillace.

CARCOMA, a port-town of Africa, S.W. of the promontory *Apollinis.* Ptolemy places it immediately after *Cartenna* and *Carepula.*

CARCOTÆ, a people of Sarmatia in Europe, who ininhabited that part of the country which was in the vicinity of the *Carbones*, according to Ptolemy.

CARCRAIG, in *Geography*, a ſmall iſland of Scotland, in the Frith of Forth; 7 miles S. E. of Dumferline.

CARCUNAH, a town of Africa, in Ethiopic Barbary.

CARCUS, in *Ancient Geography*, a name given by Ptolemy to an iſland of the Indian Ocean, which he places near Taprobana.

CARCUVIUM, a place of Spain, in Luſitania, according to the Antonin. Itin.

CARD, in the *Manufactures*, an inſtrument conſiſting of a block of wood, beſet with ſharp teeth, ſerving to arrange the hairs of wool, flax, cotton, and the like; of which there are different kinds, as ſtock-cards, hand-cards, wool-cards, tow-cards, &c. The word ſeems formed from the Latin *carduus (fullonum)* which denotes the fuller's teazle; a kind of thiſtle whoſe head is uſed to ſmooth and range the nap of cloth, &c. Skin. Etym. Angl. in voc.

They are made in the following manner. A piece of thick leather, of the ſize of the propoſed card, is ſtrained in a frame, and then pricked full of holes, into which are inſerted the teeth or pieces of iron wire. The leather is then raiſed by the edges to a flat piece of wood, in the form of an oblong ſquare, about a foot long and half a foot broad, with a handle placed in the middle of one of the longer ſides. The method of making the teeth is as follows: when the wire is drawn of the intended ſize, a number of wires is cut into proper lengths by means of a gage, and then doubled in a tool contrived for that purpoſe; after which they are bent into a proper direction by means of another tool, and they are then fixed in the leather. See CARDING, CLOTH, and COTTON *Manufacture.*

Cards for wool in England, may not be imported, nor the wire taken out of old cards, to be put into new leather and boards, in order for ſale; upon forfeiture thereof, or of the value, if not ſeized; but may be amended for the proprietor's own uſe, or for tranſportation only.

CARD-*playing*. See CARDS.

CARDALENA, in *Ancient Geography*, a country of Arabia Felix. Pliny.

CARDAMENE, or CARDAMINA, an iſland of the Arabic gulf on the coaſt of Ethiopia. It was ſeparated by the iſle of the Magi from the Trogloditic territory, according to Ptolemy and Pliny.

CARDAMILIA, in *Geography*, a town of European Turkey, in the Morea; 14 miles S. W. of Miſitra.

CARDAMINDUM, in *Botany*, Few. peruv. 3. tab. 8. and 2. tab. 42. See TROPÆOLUM *majus* and *peregrinum.*

CARDAMINE, (*καρδαμίνη*, a diminutive of *καρδαμον*, the Greek name of the water-creſs, the naſturtium of the old botaniſts; ſiſymbrium naſturtium of Linnæus.) Tourn. Cl. 5. §. 4. gen. 5. Linn. gen. 812. Schreb. 1088. Willd. 1237. Juſſ. 239. Vent. 3. 105. Gært. 833. Claſs and order, *tetradynamia ſiliquoſa.* Nat. Ord. *ſiliquoſæ*, Linn. *cruciferæ*, Juſſ. *cruciform* of Tournefort.

Gen. Ch. *Cal.* Perianth four-leafed; leaflets oblong-egg-ſhaped, obtuſe, ſomewhat ſpreading, gibbous, ſmall, deciduous. *Cor.* four-petalled, cruciform; petals inverſely egg-ſhaped, oblong, wide-ſpreading, ending in erect claws, which are twice the length of the calyx. *Stam.* Filaments ſix, awl-ſhaped; of theſe, two oppoſite ones are twice the length of the calyx, the reſt a little longer; anthers ſmall, heart-ſhaped, oblong, erect. *Piſt.* Germ ſlender, cylindrical, the length of the ſtamens; ſtyle none; ſtigma obtuſely headed, entire. *Peric.* Silique long, the ſhape of a compreſſed cylinder, two-celled, two-valved; valves opening from the baſe with a ſpring, and rolling ſpirally backwards. *Seeds* many, roundiſh.

Eſſ. Ch. Valves of the ſilique opening from the baſe with a ſpring, and rolling ſpirally backwards. Stigma entire. Calyx rather gaping.

Obſ. There is a variety of one ſpecies, in which the two ſhorter ſtamens are wanting.

* *Leaves ſimple.*

Sp. 1. C. *bellidifolia*, daiſy-leaved or alpine creſs. Linn. Sp. Flora Lapp. Ed. 2. 222. tab. 9. fig. 2. Flor. dan. tab. 20. Jacq. Miſc. v. 1. 148 tab. 17. fig. 2. "Leaves egg-ſhaped, quite entire, only a third of the length of the petiole." *Root* perennial, ſmall, ſomewhat woody. *Stems* ſcarcely two inches high, erect, ſimple, few-flowered, ſmooth. *Leaves* egg-ſhaped, ſmooth; radical ones on long petioles; ſtem ones nearly ſeſſile. *Flowers* in a terminal corymb; petals white, erect, twice as long as the calyx. *Silique* linear, obtuſe, ſmooth. Dr. Smith, Flora Brit. vol. ii. p. 697. Much obſcurity hangs over this ſpecies. Ray's C. pumila, bellidis folio, generally quoted as a ſynonym, Dr. Smith ſays, certainly does not belong to it, and is probably arabis ſtricta. The only real authority for its being a native of Great Britain is Dr. Withering, who had ſpecimens gathered wild in Scotland by Mr. Milne. All that he ſays of it is, that the root leaves are on long petioles, and that in its larger growth there are leaves on the ſtem, but rarely with petioles. Willdenow deſcribes two plants, nearly allied to each other, but, as he ſuppoſes, diſtinct ſpecies. One with the flowering ſtem not longer than the root-leaves, and either naked or with one or two leaves on long petioles; the other with the flower ſtem longer than the root-leaves, and with ſtem-leaves nearly ſeſſile. The former, a native of Lapland and Norway, he calls bellidifolia; the latter, a native of the Alps, he calls alpina. La Marck makes it an arabis, but it does not ſeem to be the arabis bellidifolia already deſcribed in this work. 2. C. *aſarifolia*, aſarabacca-leaved creſs, Linn. Sp. Pl. (Naſturtium montanum, aſari folio; Bocc. Sic. 5. tab. 3. Herm. Par. tab. 203. Rai hiſt. 816. Naſturtium alpinum, paluſtre rotundifolium, radice repente; Moriſ. hiſt. 2. p. 224.) "Leaves ſimple, ſomewhat heart-ſhaped." *Root* perennial, thick, ſending out numerous fibres. *Stems* about ſix inches high. *Leaves* petioled, a little ſcolloped, ſmooth. *Flowers* white. *Siliques* long, burſting at the leaſt touch when ripe. It poſſeſſes the qualities of ſcurvy-graſs in a greater degree than the other ſpecies of cardamine, and is often ſubſtituted for it. A native of Savoy, Tuſcany, &c. 3. C. *nudicaulis*, naked-ſtemmed creſs, Linn. Sp. Pl. Gmel. Sib. 3. p. 273. n. 43. "Leaves ſimple, lanceolate, ſcollop-toothed; ſtems naked." *Stems* about nine inches high. *Leaves* about three inches long, ſmooth, firm. *Siliques* ſlender, ſtriated, ſmooth, compreſſed between the ſeeds. A native of Siberia. 4. C. *nivalis*, Willd. Pallas. itin. 2. App. 4. 113. t. u. Germ. tom. 3. Pl. 17. p. 264. French. Tranſ. "Stem and root-leaves ſimple, oblong, toothed. Whole plant ſmooth. Root perennial. Root-leaves leſſened at the baſe into a petiole; ſtem-leaves ſeſſile. *Flowers* ſmall, white. Siliques reflexed. 5. C. *petræa*, Linn. Sp. Pl. "Leaves ſimple, oblong, toothed." This ſpecies is omitted by La Marck and Willdenow. Willdenow ſays it is a dubious plant, all the ſynonyms certainly belonging to arabis hiſpida. This, with reſpect to the Welſh and Scotch ſuppoſed ſynonyms, is confirmed by Dr. Smith. But on his authority we have retained the ſpecies; for he ſpeaks of the true Swediſh C. petræa of Linnæus in terms implying a ſatisfactory acquaintance with the plant, which we preſume is preſerved in the Linnæan herbarium. See Engliſh Botany, p. 469. The C. petræa of Lightfoot is there deſcribed, and figured as a new ſpecies under the name of C. haſtulata. But before the publication of the Flora Britannica, Dr. Smith was convinced that it is properly an arabis, and nothing more than a variety of arabis hiſpida, and of the Welſh plant miſcalled A. petræa, by Dillenius, Hudſon, and Withering. As ſuch it appears in the latter maſterly work. We now perceive that in the article arabis, we have been led into an error by following profeſſor Martyn, who thought the ſtricta of Hudſon, and the hiſpida of Linnæus, to be the ſame plant.

** *Leaves ternate.*

6. C. *reſedifolia*, Linn. Sp. Pl. (Naſturtium alpinum minus, reſedi folio; Bauh. pin. 104. Bocc. Muſ. 2. tab. 46.) "Lower leaves undivided; upper ones three-lobed and winged." *Root* biennial. *Stem* four or five inches high, ſlender, ſmooth, feeble. *Root-leaves* petioled, egg-ſhaped or ſpatula-ſhaped, entire. *Flowers* ſmall, white. *Siliques* ſlender, an inch long. It has ſome reſemblance to C. bellidifolia, but is conſtantly diſtinguiſhed by its winged ſtem-leaves, the terminal leaflet of which is larger than the others. Lam. A native of the Pyrenées, and of the Swiſs and German Alps. 7. C. *trifolia*, Linn. Sp. Pl. (Naſturtium alpinum trifidum; Bauh. pin. 104.) "Leaves ternate, obtuſe; ſtem almoſt naked." *Root* perennial. *Stems* ſeveral, ſix or ſeven inches high. *Root-leaves* ternate; leaflets a little angular, ſmooth, on a reddiſh petiole; *ſtem-leaves* one or two; leaflets narrow. *Flowers* white or reddiſh, in terminal cluſters. *Siliques* oblong, ſwollen with the ſeeds. A native of the Alps. 8. C. *ſcutata*, Willd. Thunb. Linn. Soc. Tranſ. 2. p. 399. "Leaves ternate, ſcutate, curled; ſtem almoſt naked." Perennial. A native of Japan. 9. C. *africana*, Linn. Sp. Pl. Tourn. 225. Vahl. Symb. 2. p. 77. (Naſturtium africanum; Herm. Par. 202. tab. 202. Pluk. Alm. 152. tab. 101. f. 5.) "Leaves ternate, acuminate; ſtems much branched." *Root* perennial. *Stems* nine inches or a foot high, erect, angular, hairy. *Leaves* on long petioles; leaflets petioled; the terminal one large, bluntly ſerrated, with ſcattered hairs about the veins. *Flowers* in corymbs or racemes, ſmall. *Siliques* an inch and half long, compreſſed. A native of Africa.

*** *Leaves winged.*

10. C. *chelidonia*, Linn. Sp. Pl. Pallas it. 3. 34. Lour. Coch. 398. (C. glabra, chelidonii folio; Tourn. Inſt. 224. Siſymbrium montanum latifolium: flore purpureo, Bar. ic. 156. Naſturtium Pyrenæorum, Herm. par. tab. 204.) "Leaves winged; leaflets in fives, gaſhed." *Root* perennial. *Stem* about nine inches high, nearly ſmooth, with many aſcending branches. *Leaflets*, eſpecially the terminal one, remarkably large, roughiſh, with ſhort hairs. *Flowers* large, purpliſh white, in terminal corymbs, lengthening into ſpikes; petals obtuſe or ſlightly emarginate, twice the length of the calyx. A native of the Pyrenées, Italy, and Siberia. 11. C. *thalictroides*, Willd. La Marck. Allion ped. tab. 57. fig. 1. (C. Plumieri; Vil. delph. 3. tab. 38. Naſturtium thalictri folio; Bocc. Muſ. 171. tab. 116.) "Leaves ſimple, ternate and winged; leaflets in fives, obtuſe, three-lobed." *Root* biennial. *Stems* about four inches high, ſlender. *Root-leaves* often ternate, on rather long petioles; terminal leaflet large, three-lobed; lateral ones irregularly egg-ſhaped; upper ſtem-leaves in fives. *Flowers* white, twice as long as the calyx. *Siliques* an inch long, ſlender, a little compreſſed, with eight or ten reddiſh ſeeds. A native of Piedmont and Dauphiny. 12. C. *macrophylla*, Willd. (C. chelidonia, Pal. it. 3, p. 34. Lepich. it. 1. p. 243. Siſymbrium pinnis ovatis ſerratis; Gmel. Sib. 3. tab. 62.) "Leaves winged; leaflets in fives or ſevens, egg-ſhaped, acuminate, unequally toothed." *Root* perennial. *Stem* a foot high. A native of Siberia. 13. C. *impatiens*, Linn. Sp. Pl. Eng. Bot. Pl. 80. "Leaves winged, ſtipulate; leaflets moſtly gaſhed, numerous; petals caducous; ſiliques erect." *Root* annual. *Stem* from twelve to eighteen inches high, remarkably ſtiff in its general habit, upright, more or leſs zig-zag, angular, hollow, ſmooth. *Leaves* alternate, nearly ſmooth, pale, extended at the baſe into two narrow, acute, ſingularly ciliated ſtipules not found in any other known ſpecies. *Flowers* ſmall, ſcarcely longer than the calyx, ſoon falling off, ſo that the plant has been thought to be without petals by Linnæus, Pollich, and Leers. A native of mountainous countries in ſeveral parts of Europe: about Matlock bath in Derbyſhire, Kilnſay cragg in Wharfdale, Yorkſhire, and plentifully in Weſtmoreland and Cumberland. It is ſcarce in the ſouth of England, but we gathered it laſt ſummer (1805) about the ſkirts of Wichberry wood, near Hagley, Worceſterſhire. 14. C. *parviflora*, Linn. Sp. Pl. "Leaves winged without ſtipules: leaflets lanceolate, obtuſe." *Root* annual. *Stem* ſhorter and leſs acutely angular than that of C. impatiens. *Petals* not caducous. *Siliques* erect, on horizontal peduncles. If two ſpecies have not been deſcribed by different authors under the ſame name, the leaflets of the upper ſtem-leaves vary in being either lanceolate or linear, perfectly entire, or a little toothed. It is now generally agreed that what ſeveral Engliſh and German botaniſts have taken for the parviflora is only a variety of hirſuta. A native of the ſouth of Europe, and Siberia. 15. C. *penſylvanica*, Willd. "Leaves winged; leaflets angularly toothed, obtuſe." Whole plant ſmooth. *Stem* erect, branched. *Leaflets* five or ſeven, with two large teeth on each ſide, giving them an angular appearance; thoſe on the higheſt leaves lanceolate, obtuſe, perfectly entire; the terminal one wedge-ſhaped, often trifid. *Siliques* narrow, erect. 16. C. *græca*, Linn. Sp. Pl. "Leaves winged; leaflets palmate, equal, petioled." *Root* annual. *Stems* five or ſix inches high, ſlender, branched. *Leaflets* from ſeven to thirteen, petioled, obtuſe, cut into three or four lobes, ſo as to appear palmate. *Siliques* from twelve to fifteen lines long, ſtraight, compreſſed, ſword ſhaped. A native of Sicily, Corſica, and the Grecian iſlands. 17. C. *hirſuta*, Linn. Sp. Pl. Hal. helv. n. 472. Eng. bot. 492. "Leaves winged; leaflets roundiſh, obtuſely angular, petioled." *Root* annual. *Stems* from three to twelve inches high, more or leſs zig-zag, clothed with ſcattered prominent hairs. In moiſt ſituations, and eſpecially in wet ditches, it riſes to eight or nine inches high, and has, we believe, conſtantly ſix ſtamens, and a ſtrong, rather unpleaſant ſmell and taſte. On dryiſh ditch-banks, and in fallow fields where it often occurs, its ſtem is much ſhorter, and its flowers have only four ſtamens, but its root-leaves are often very luxuriant, yet conſiderably milder, and are a good ingredient in a ſpring ſallad. Linnæus's ſpecific character was formed from the latter variety, whence Withering and Lightfoot miſtook the former for his parviflora, which has not been found in England; and Withering, after he diſcovered his error, thought it a new ſpecies which in the third edition of his Botanical Arrangement he called flexuoſa. Dr. Smith firſt determined them to be one ſpecies; and in confirmation of his judgment, we once found, in a kind of intermediate ſituation between wet and dry, ſeveral ſpecimens which had tetrandrous, hexandrous, and, in two or three inſtances, pentandrous flowers on the ſame plant. 18. C. *latifolia*, Willd. Vahl. Symb. 2. p. 77. "Leaves winged; leaflets five, ſomewhat angularly toothed, ſmooth." Whole plant ſmooth. *Stem* a foot high, ſimple, aſcending. *Leaves*

petioled, remote; leaflets oblong, unequal at their margin, with one or two teeth. *Flowers* in a corymb, numerous; peduncles an inch long; leaves of the calyx oblong, with a membranous edge; petals three times the length of the calyx, purple, ſlightly emarginate. Vahl." A native of Spain. 19. C. *pratenſis.* Ladies-ſmock, cuckow-flower, milk-maid. Linn. Sp. Pl. Curt. Flor. Lond. faſc. 3. tab. 40. Mart. Flor. inſt. tab. 40. Mart. Flor. inſt. tab. 95. Woodv. Med. tab. 30. Eng. bot. 776. Flor. Dan. tab. 1039. "Leaves winged: radical leaflets roundiſh, thoſe on the ſtem lanceolate." *Root* perennial. frequently toothed in ſome degree like that of coral-wort. *Stem* about a foot high. erect, ſtiff, ſimple. *Leaves* winged: root ones on long petioles, ſomewhat lyreſhaped; leaflets ſomewhat hairy; ſtem ones ſeſſile, alternate; leaflets ſmooth, channelled, generally entire. *Flowers* large, purpliſh or white, in a handſome terminal corymb, becoming double by cultivation. The colour and appearance of the flowers, the ſtyle rather more lengthened than in any other ſpecies of Cardamine, and above all a tendency of the leaves in wet ſhady places to bear bulbs, ſhew an affinity to the genus Dentaria or coral-wort. It has the ſame ſenſible qualities as the Siſymbrium naſturtium or water creſs, but in a very inferior degree. The flowers have obtained a place in the Britiſh Pharmacopœias on the authority of Sir George Baker, who recommended them to be taken internally in ſpaſmodic diſorders: they have even been ſaid to cure the epilepſy, but experience has not confirmed their reputation. They were preſcribed dried, which Dr. Smith obſerves, is not an advantageous ſtate for plants of this natural order. See Dr. Smith in Engliſh botany, and Woodville's Medical Botany. A native of wet meadows in many parts of Europe. 20. C. *amara*, bitter creſs. Linn. Sp. Pl. Curt. Flor. Lond. faſc. 3. tab. 39. Eng. Bot. 1000. "Leaves winged: root leaflets roundiſh, ſtem ones angularly toothed. Stem taking root at the baſe. Anthers violet-coloured." *Root* perennial, toothed. *Stems* procumbent at the baſe, and taking root in the mud, then upright, a foot high or more, ſomewhat zig-zag. *Leaves* nearly ſmooth. *Flowers* large, white or cream-coloured; ſtyle a little elongated and oblique. Found on the banks of rivers and brooks in ſeveral parts of Europe, but not ſo common as the preceding. On the banks of the Thames about London, of the Aire, Eure, and other rivers in Yorkſhire, King-ſtreet meadows near Norwich, and in Scotland. 21. C. *granuloſa*, Willd. Allion, pedem. (Naſturtium pratenſe odoratum radice granulis tuberoſa; Bauh. pin. 104.) "Root-leaves ſimple, roundiſh, on long petioles; ſtem-leaves winged; leaflets lanceolate; root granulated." *Root* perennial. *Stem* near half a foot high, erect, ſimple. *Root-leaves* entire, decurrent into the petiole: ſtem-leaflets obtuſe, entire. *Flowers* white; petals obtuſe, not emarginated, three times as long as the calyx. A native of meadows near Turin. 22. C. *virginica*, Linn. Sp. Pl. (Alyſſum, Gron. virg. 1. p. 170. Naſturtium burſæ paſtoris folio: Pluk. Alm. 231. tab. 101. fig. 4.) "Leaves winged; leaflets lanceolate, one-toothed at the baſe." *Root-leaves* ſpread into a circle; leaflets numerous, almoſt imbricated; ſtem-leaves few, often linear, entire. La Marck thinks it a true Arabis. A native of Virginia. 23. C. *ſarmentoſa*, Forſt. Flor. auſtral, n. 529. Found by Forſter in the iſland of Teautea in the South Seas.

The varieties of pratenſis and amara with double flowers may be readily propagated by parting the roots. They thrive beſt in ſhady ſituations.

CARDAMINE *alpina 3-minima*; Cluſ. hiſt. See LEPIDIUM *alpinum.*

CARDAMINE *puſilla ſaxatilis montana diſcoides;* Col. ecph. tab. 273. See LEPIDIUM *petræum.*

CARDAMINE *ſtoloniſera;* Scop. Flor. Carn. and Martyn's Miller. See ARABIS *Halleri.*

CARDAMOM: for the botanical characters, ſee AMOMUM *cardamomum* and *repens.*

The Cardamomums imported into Europe have been commonly diſtinguiſhed by the epithets, Majus, Medium, and Minus: but the ſpecies from which the two former are produced have been ſo imperfectly deſcribed, and their botanical hiſtory is ſo confuſed, that nothing deciſive can be ſaid concerning them. One of the three is probably the Cardamomum of Linnæus. The ſeeds of the *Minus*, which are now generally preferred for medical purpoſes, are ſaid by Sonnerat to be the produce of his A. repens, diſcovered by him on a mountain on the coaſt of Malabar, where it grows ſo plentifully as to ſupply all India with its ſeeds, and which on that account is called the monutain of Cardamoms. It is figured in Woodville's medical botany. They are brought to Europe in their natural huſk or pod, without which they would loſe a part of their flavour, and this is divided internally into three cells, in each of which are contained two rows of triangular ſeeds, browniſh on the outſide and white within. Theſe ſeeds have an extremely grateful aromatic ſmell, and when chewed, they impart a glowing warmth, and grateful pungency to the mouth. Their virtue is extracted both by alcohol and by water; the former giving a clear, the latter a turbid ſolution, both yellowiſh. The watery infuſion is highly mucilaginous. When theſe ſeeds, previouſly bruiſed, are diſtilled with water, a ſmall quantity of eſſential oil, about $\frac{1}{24}$th of the weight of the ſeeds, on an average, may be ſeparated, and in this ſeem to reſide all the aromatic qualities. It is of a pale yellow, very acrid, and ſtrongly ſmelling of the cardamom. The watery ſolution inſpiſſated yields a gummy-reſinous extract; the ſpirituous ſolution gives a reſinous extract much leſs in quantity. Neither of them are uſed.

Cardamom is one of the moſt grateful of the mild aromatics, and is uſed either to flavour other medicines, or as a ſtimulant and cordial. It agrees in general particularly well with dyſpeptic ſtomachs, and prevents the griping or nauſeating effects of many of the ſaline or other purgatives. A tincture is made of it both ſimple and compounded with carraway, cinnamon, and cochineal. Cardamom alſo enters the compoſition of ſome other aromatic preparations.

The ſeeds of the Cardamomum *Majus*, denominated alſo *Grana Paradiſi* or *Marieguetta, Greater Cardamon Seeds*, are hard reddiſh-brown angular ſeeds, much larger than the laſt-mentioned, about the ſize of radiſh ſeeds, generally imported without the huſk, from the Eaſt Indies. The ſmell and flavour of theſe are much leſs aromatic and grateful than thoſe of the leſſer ſeeds, and the taſte is hot, biting, and ſomewhat coarſe. It yields an eſſential oil not very acrid, but the watery and ſpirituous ſolutions are both highly pungent. Theſe ſeeds are but little uſed. See Lewis's "Materia Medica," and Woodville's Medical Botany.

CARDAMUM, in *Geography*, an iſland ſituate in the paſſage from Malacca to the ſtraits of Sincapore, or South end of Malacca ſtraits.

CARDAMYLA, in *Ancient Geography*, a town of Meſſenia, almoſt ſouth of Gerenia. It was one of the ſeven cities which Agamemnon wiſhed to preſent to Achilles. Pauſanias ſpeaks highly of the temple of Minerva and a ſtatue of Apollo "Carneus," the worſhip of whom was common to all the Dorians. This town was detached by Auguſtus from Meſſenia, but afterwards reſtored to its original maſters, the Lacedæmonians.

CARDAN, JEROM, in *Biography*, a voluminous philoſophical and medical writer, was born at Pavia Sept. 24th, 1501. His father, who was an eminent civilian, and a diſtinguiſhed

guiſhed ſcholar at Milan, took the charge of his education, in the early part of his life, and he particularly inſtructed him in mathematics, aſtronomy, and judicial aſtrology. He is ſaid not to have been born in wedlock, and in the account he gives of his own life he ſays, his mother, when pregnant with him, endeavoured to deſtroy him, by procuring abortion. She was a woman of ſtrong paſſions, and he probably derived from her that verſatility of diſpoſition, and violence of temper, which prevented his reaping the advantages he might have obtained from his genius and learning. At the age of 20 he entered the univerſity of Pavia, where he proſecuted his medical and philoſophical ſtudies with ſucceſs; he then went to Padua, in 1524, and in 1525 he took the degree of doctor in medicine. In 1529 he repaired to Milan, but was ſome time before he acquired any credit in his profeſſion; he was therefore reduced to great difficulties. His firſt appointment was that of profeſſor of mathematics, for which he was peculiarly qualified, and a few years after, viz. in 1539, he was admitted a member of the medical college in that city. This brought him into notice; but that he was not at peace with his brethren, appears by his two firſt publications, "De malo recentiorum Medicorum medendi uſu," Venet. 1536; and "Contradicentium Medicorum Libri duo," Lyons, 1548: in the firſt he ſeverely cenſures the practice of his cotemporaries; in the other the inconſiſtent and often contradictory accounts of the ſame diſeaſe, given by the moſt accredited writers, even among the ancients. In 1547 the king of Denmark, on the recommendation of Veſalius, invited him to accept the office of a profeſſor in the univerſity of Copenhagen, with a handſome ſalary; the offer was, however, refuſed, his time, we may preſume, being now more advantageouſly employed in practice. The reputation he had acquired in this way occaſioned his being ſent for to Scotland, about this time, to attend Hamilton, archbiſhop of St. Andrews, and brother to the regent, who was afflicted with aſthma, for which he had before tried the aſſiſtance of the phyſicians to the king of France, and the emperor, but without receiving any benefit. Cardan was more ſucceſsful, for by the end of about two or three months the archbiſhop was ſo much relieved, as to allow him to return to his own country, having received a large remuneration for his ſervices, and liberal offers to retain him in Scotland. On his return he paſſed through London, and is ſaid to have caſt the nativity of our king, Edward VI.; but we do not learn that he foretold the ſhort date of that monarch's exiſtence. At Milan he continued to reſide until 1559, his time being employed in the practice of medicine, and in teaching mathematics; from 1559 to 1562 he reſided at Pavia, being invited to accept the chair of profeſſor in medicine there; and from 1562 to 1570, at Bologna, where he filled a ſimilar office. He was now, for what cauſe we are not informed, thrown into priſon, but as he was ſoon liberated, we may ſuppoſe for no very ſerious offence; for though haughty and turbulent, he ſeems generally to have acted with ſufficient caution, as in whatever country he reſided, he was never ſeriouſly embroiled with the church or ſtate. It appears, alſo, that he had the faculty of attracting the notice, and procuring the friendſhip of thoſe perſons who, by their wealth or power, were moſt able to ſupport him, but by the waywardneſs of his diſpoſition he ſoon loſt their favour; hence he was always in a ſtate of indigence, which he relieved by ſending to the preſs ſome haſty effuſions, which had no more of his care than it coſt him to write them over. His works, therefore, which were collected after his death, and which fill ten maſſive folio volumes, conſiſt of ſuch a confuſed and undigeſted medley, that it would require more labour to put them into order than their intrinſic value would compenſate. Soon after being releaſed from priſon, he was ſent for to Rome, was made member of the college of phyſicians there, and aſſigned a penſion by the pope, which he retained to the time of his death, Sept. 21ſt 1576. It has been ſaid, that he ſtarved himſelf, in order to verify his own prediction of the time of his death; but this is improbable, becauſe he had long before acknowledged the failure of a ſimilar prediction. Thuanus, however, relates (lib. 62. p. 155.), that this fact was believed. Scaliger aſſerts it; and it is ſaid that his father died in the ſame manner, in 1524. Of him it is alſo ſaid, that his eyes were white; and that he ſaw in the night time, and could ſee without ſpectacles. Cardan "De Vita propria," p. 10. His reigning paſſion, if we believe his own account, was a deſire to acquire and communicate knowledge. Though a large portion of his life was paſſed in a ſtate of indigence, yet it did not appear to depreſs his ſpirits. He conſidered knowledge, of which he could not but be conſcious he had a large ſhare, as infinitely preferable to wealth. That he had no mean opinion of his own talents, or of his value to the community, ſeems evident by the following, ſuppoſed to have been written by himſelf, and intended as his epitaph:

> "Non me terra teget, cœlo ſed raptus in alto,
> Illuſtris vivam, docta per ora virûm.
> Quidquid venturis ſpectabit Phœbus in annis,
> Cardanus noſcet, nomen et uſque ſuum."

Vanity ſeems to have been with Cardan a predominant paſſion; for though with apparent frankneſs he recites the various adventures of his life, which ſhew the inconſtancy of his temper, he nevertheleſs conceals or palliates others, which are more diſhonourable. Addicted from his youth to judicial aſtrology, he pretends to deduce, by means of his ſkill in this ſcience, from the imaginary influence of celeſtial bodies, an apology for the licentiouſneſs of his opinions, and the eccentricities of his conduct. Such was his confidence in the concluſions furniſhed by this art, that in his treatiſe entitled "Explicatio Genituræ," or a calculation of nativity, he hazards many predictions concerning his own character and fortune, as well as others that related to Jeſus Chriſt. Whilſt he acknowledges a propenſity to irreligion, and advances ſome ſentiments that ſubject him to the ſuſpicion, if not to the direct charge, of atheiſm, he juſtly incurs the reproach of credulity and ſuperſtition. Having been accuſtomed, in conſequence of his father's inſtruction, at eight in the morning on every firſt of April to repeat a prayer and an Ave, he conceived that he was thus ſecure of obtaining any favour he ſhould aſk. From numerous prodigies that occurred, both ſleeping and waking, he pretended to infer what ſhould befal him; and he ſometimes ſeems to intimate, that, like Socrates, he was attended by a particular genius. Whilſt he boaſts of certain ſupernatural gifts that were beſtowed upon him, he muſt either be conſcious of wilful falſehood, or labour under a fanatical derangement of the underſtanding. Indeed, many have ſuppoſed that the preponderance of his imagination over his judgment did actually produce a ſpecies of inſanity. At the ſame time he affected ſingularities of dreſs and of behaviour, which ſeemed to indicate a degree of ſtudied artifice and impoſture. Under the influence of ſtrong paſſions, he was frequently betrayed, notwithſtanding his diſtinguiſhed abilities and erudition, into errors of judgment and irregularities of conduct, which tarniſhed the luſtre of his other laudable qualities, depreciated his character, and proved occaſions of perplexity and unhappineſs to himſelf. Theſe errors and irregularities aggravated, in no ſmall degree, his domeſtic diſtreſs. One of his ſons married a woman, deſtitute both of fortune and reputation, and determined to get rid of her by poiſon, he was convicted, condemned, and executed. Cardan attempted to juſtify this atrocious crime, on the ground of the wife's infidelity ; and pretends that the divine vengeance purſued the judges of his ſon for their ſentence againſt him. Another ſon behaved ſo ill, that he was obliged to impriſon, and at length to diſcard and diſinherit him.

In his medical profeſſion, Cardan was a ſagacious obſerver, and an induſtrious collector of facts ; but he was at the ſame time ſo boaſtful and ſo credulous, as to claim little or no confidence. He wrote on every branch of medicine ; but the volumes in which he treats of natural hiſtory, which give accounts of extraordinary cures, or deſcriptions of unuſual or preternatural productions, have been received with the greateſt favour, and have been the moſt frequently reprinted. His accounts, however, under theſe heads, muſt not be always implicitly admitted ; the greater part of theſe will be found in his treatiſe “De Varietate Rerum,” fol. Baſ. 1550, and again 1557. In his “Commentaries on the Aphoriſms of Hippocrates,” 1553, 4to. Patav. he records a caſe of a wound in the pericardium, in which the patient recovered, and of a perſon who loſt a portion of the brain, equal in ſize to a hen's egg. The man lived three years after the accident, but in a ſtate of fatuity. In his “Domo ruſtica,” Straſb. 1589, fol. he deſcribes the diſeaſes incident to cattle, with the manner of treating them. The 8th book of his treatiſe “De Subtilitate,” publiſhed 1550, is entirely botanical, and contains deſcriptions of numerous plants, then firſt introduced into Italy. In his “De Chinæ et Sarſaparillæ Radicibus,” 8vo. 1566, he deſcribes the manner of preparing the decoction of thoſe roots, and of adminiſtering them. In his “Opuſcula Artem Medicam exercentibus utiliſſima,” are ſome curious obſervations on the external application of cold water, which he had witneſſed in Scotland ; and extraordinary praiſes of the internal uſe of the pure element in fevers and other diſeaſes. His “Ars curandi parva, quæ eſt abſolutiſſima medendi Methodus,” Baſil, 1566, 2 vols. gives his general method of cure in diſeaſes, with many particular obſervations. His “Opus novum de Sanitate tuenda ac Vita producenda,” a poſthumous work, publiſhed in 1580, fol. contains a copious enumeration of articles of diet, and of directions for the mode of living, blended with much idle and ſuperſtitious matter. For an account of his other medical works, &c. ſee Haller Bib. Med. pract. chirurg. anat. et botan. or Eloy's Dict. Hiſtor. The cures which he undertook to perform by ſecret charms, or by the aſſiſtance of inviſible ſpirits, gained for him with the vulgar, the reputation of a magician ; but in reality they were only evidences of a mind infatuated by ſuperſtition.

In mathematical ſcience Cardan claims a tribute of more unreſtricted commendation. In algebra particularly he challenges the honour of having made ſome important diſcoveries ; though his pretenſions, as an original inventor, have been conteſted by Tartaglia. Theſe diſcoveries are contained in the 10th book of his Arithmetical writings, which was publiſhed at Milan in the year 1545. See ALGEBRA. In order to juſtify Tartaglia's prior claim, it has been alleged, that in a trial of ſkill with Antonio Maria del Fiore or Florido, he had diſcovered the general theory of equations of the third degree. The occaſion of it was this : Florido had received from his maſter Scipion Ferreo, about 30 years before, a general rule for reſolving a particular caſe of cubic equations, expreſſed by $x^3 + bx = c$. Preſuming on this diſcovery, Florido provoked Tartaglia into a conteſt, in which each ſhould propoſe to the other 30 queſtions ; and he who firſt reſolved them within a limited time, was to win the propoſed wager. Tartaglia, eight days before the ſtipulated time, diſcovered not only the mode of reſolving the caſe of Florido, viz. $x^3 + bx = c$, but alſo the caſe $x^3 = bx + c$. On the day of meeting, Tartaglia reſolved all his adverſary's queſtions in the ſpace of two hours, without receiving one anſwer from Florido in return. Accordingly, the wager was decided in his favour, and he generouſly remitted the forfeit incurred by Florido. Cardan, who was preparing a large work in arithmetic, algebra, and geometry, having heard of Tartaglia's diſcoveries in cubic equations, was very anxious for obtaining his rules of ſolution, that he might inſert them in his propoſed work. After ſeveral urgent invitations, he at length prevailed on Tartaglia to pay him a viſit at Milan in the year 1539 ; and in a conference, induced this mathematician to furniſh him with his rule, which he did in 27 rude Italian verſes : but he firſt exacted from Cardan a promiſe on oath that he would not publiſh what he diſcloſed to him. Some difficulty afterwards occurring in the explication of theſe verſes, and in the uſe of the rule conveyed by them, Cardan obtained from Tartaglia the ſolution he requeſted. For ſome time Cardan kept his promiſe, though not without ſome ſuſpicions on the part of Tartaglia, with regard to his integrity. At length, however, when in 1545 he publiſhed his work entitled “Ars magna,” he inſerted in it the ſolution of Tartaglia, attributing it to the inventor. Tartaglia complained of Cardan's violation of faith ; and he juſtified himſelf by ſaying, that the additions which he had made to Tartaglia's method of ſolution, gave him a right to publiſh it. To this purpoſe Montucla obſerves, that Cardan had in fact the merit of partly extending, and much illuſtrating the theory of Tartaglia. The diſpute between them was long and acrimonious, and terminated only with the life of Tartaglia in 1557. The rules which occaſioned this conteſt, have, however, retained the name of Cardan : although it would be more equitable to give them the title of the formula of Tartaglia, ſince they were originally his. For a further account of this controverſy, and of the letters that paſſed between the diſputants, we refer to Montucla's Hiſt. Mathem. tom. i. p. 591, &c. and Hutton's Math. Dict. art. Algebra.

The philoſophical notions of Cardan, both as they reſpect matter and mind, are principally detailed in his works “De Subtilitate,” and “De Varietate Rerum ;” but they are ſo blended with fanatical viſions, and the moſt extravagant and delirious effuſions of myſtical folly, and ſo ill digeſted and arranged, that they cannot be eaſily explained or underſtood. They form a kind of confuſed medley, diſtinguiſhed more by an affectation of novelty and ſingularity, and by the indulgence of an unbridled imagination, than by a ſound and diſcriminating judgment ; and for want of methodical arrangement, they contribute little to the promotion of important and uſeful ſcience. They are, however, occaſionally intermixed with experiments and obſervations on natural phenomena ; and they are chiefly uſeful as by the freedom and boldneſs with which the author divulged them, they ſerve to emancipate the human mind from the fetters of ancient authority. Upon the whole, Cardan, notwithſtanding the variety and apparent originality of his writings, muſt be ranked among the unſucceſsful adventurers in philoſophy. Of his peculiar dogmas, the following may ſerve as a ſpecimen. “Primary matter, which remains immutably the ſame, fills every place, whence, without the annihilation of matter, there can be no vacuum. Three principles ſubſiſt every where ; matter, form, and mind. There are in matter three kinds of motion ; the firſt, from form to element ; the ſecond, the reverſe of this ; the third, the deſcent of heavy bodies. The elements, or paſſive principles are three ; water, earth, and air ; for naturally all things are cold, that is, deſtitute of heat. The agent in nature is celeſtial heat; the air, being expoſed to the action of the ſolar rays, is perpetually in motion. The moon, and all the other heavenly bodies, are luminous from themſelves. The heavens are animated by an ever active principle, and are therefore never quieſcent. Man, having mind as well as ſoul, is not an animal. The diſpoſitions of men are produced, and all moral affairs are directed by the influence of the ſtars. The mind is univerſally diffuſed, and though it appears multiplied, is but one; it is extrinſically, and for a time, attached to human bodies, but never periſhes."

In his book above-mentioned, "De Subtilitate," Cardan compares the dogmas of various religions, and the arguments for them, and it is ſaid, puts the weaker in the mouth of the Chriſtian. The works of Cardan, treating of metaphyſics, logic, natural philoſophy, medicine, mathematics, and morals, were collected by Spon, and publiſhed in ten volumes folio, Leyd. 1663. Of his numerous and multifarious publications, one reaſon is aſſigned from his own confeſſion, that his poverty induced him to fill up his ſheets, with which he ſupplied his bookſeller at a fixed price, with any thing that occurred to him. To this circumſtance ſome have aſcribed the various diſcuſſions and conſequent obſcurity that have puzzled his readers. He was attacked with much acrimony by ſeveral writers, and particularly by J. C. Scaliger, who is ſaid to have envied his philoſophical reputation and medical ſucceſs. Brucker's Hiſt. Phil. by Enfield, vol. ii. p. 518. Gen. Dict. Moſheim E. H. vol. iv. p. 163. Haller's Bib. Med. pract. Chirurg. Anat. et Botan., et Eloy. Dict. Hiſtor.

CARDANO, in *Geography*, a town of Italy, in the duchy of Milan, ſeated on the Arno.

CARDASS, a ſort of card, proper for carding flocks of ſilk, to make cappadine of it. It is alſo the name which the French give to thoſe flocks of ſilk.

Cardasses is alſo the name which, in the cloth manufactories of Languedoc, they give to a ſort of large card, which is uſed for carding the dyed wool, deſigned for making cloth of mixed colours.

CARDAVA, in *Ancient Geography*, a town placed by Pliny in the interior of Arabia.

CARDEN, in *Geography*, a town of Germany, in the circle of the Lower Rhine, and electorate of Treves, ſeated on the Moſelle; 27 miles N.E. of Treves.

CARDENNOSSA, a town of Spain, in Old Caſtile; 4 leagues from Avila.

CARDERS, in the *Woollen Manufactory*, are perſons who prepare wool, &c. for ſpinning, &c. See Carding and Cloth.

Carders, ſpinners, weavers, fullers, ſheermen, and dyers, not performing their duty in their occupations, ſhall yield to the party grieved, double damages; to be committed until payment. One juſtice to hear and determine complaints.

Carders, combers, ſorters, ſpinners, or weavers, conveying away, embezzling, or detaining any wool or yarn, delivered by the clothier, or any other perſon, ſhall give the party grieved ſuch ſatisfaction as two juſtices, mayor, &c. ſhall think fit: if not able or willing to make ſatisfaction, for the firſt offence to be whipped, or ſet in the ſtocks in ſome market-town, or in any other town where the offence is committed: the ſecond offence to incur the like, or ſuch further puniſhment, by whipping, &c. as juſtices ſhall think proper. Conviction by one witneſs on oath, or confeſſion.

CARDI, Ludovico, called *Cigoli* and *Civoli*, in *Biography*, an eminent hiſtorical painter, a ſcholar of Santi di Titi, gave a new ſtyle to the Florentine ſchool, and, though he did not approach nearer to the ſtyle of Correggio than any of his contemporaries, as Baldinucci expreſſes himſelf, he acquired very conſiderable eminence in his art. He availed himſelf with ſucceſs of Correggio's chiaroſcuro, joined to it ſkill in deſign which he acquired from the antique ſtatues, and from the works of Michael Angelo, Buonarotti, and other maſters in correct drawing, and ſet it off by judicious perſpective, and a much more lively colour than that of the Tuſcan ſchool; nevertheleſs, his pictures do not exhibit that contraſt of tints, that impaſto, that ſplendour, that graceful air, thoſe bold fore-ſhortenings, which conſtitute the character of the head of Lombard art. Whilſt the general tone of his colour is Lombardeſque, his draperies reſemble thoſe of Paolo Veroneſe, and he ſometimes approaches the depths of Guercino. To the claſs of his excellent pictures, poſſeſſed by the grand duke of the Pecori family, and diſperſed through private collections at Florence, we may refer his Trinity, in the church of St. Croce, his St. Albert, in that of St. Maria Maggiore, the Martyrdom of Stephen, at the Siſters of Monte Domini, which Pietro da Cortona ranked with the principal pictures at Florence. St. Anthony converting a Heretic is conſidered as ſuperior to any other at Cortona. His St. Peter healing the Cripple, in the Vatican at Rome, is placed by Andrea Sacchi next to the Transfiguration of Raphael and the St. Jerom of Domenichino. The merit of this picture, now indeed utterly deſtroyed by the humidity of the place, and other circumſtances, procured him the title of Cavaliere. This great artiſt alſo engraved a few plates in a ſlight, neat ſtyle, evincing, however, the hand of a maſter. Among others is a ſmall plate repreſenting "Mary Magdalen waſhing the Feet of Chriſt, at the Table of Simon the Phariſee." The heads of the figures, which are numerous, are remarkably beautiful; particularly thoſe of our Saviour and Mary Magdalen. He died at Rome in 1613, aged 54. Pilkington and Strutt.

CARDIA, in *Anatomy*. See Stomach.

Cardia, in *Ancient Geography*, a town ſituated near the Cherſoneſus of Thrace, at the bottom of a gulf, and to the weſt of the iſthmus, which joins the peninſula to Thrace, near the mouth of the Melas. It derived its name, according to Pliny, from its being built in the form of a heart. This city was conſiderable, when it was ſurrendered to the Athenians, at the time of the conteſt of the king of Thrace with Philip. They founded colonies in it, in order to ſecure the poſſeſſion of it, but afterwards abandoned it. Lyſimachus, the ſucceſſor of Alexander, demoliſhed it, and from its ruins raiſed the city of Lyſimachia, in the iſthmus of the Cherſoneſus. It probably recovered itſelf, as Ptolemy, five centuries after the reign of Lyſimachus, repreſents it as a town. There were medals of this city in ſilver, bronze, and gold, with the ſymbol of a heart.

CARDIAC, or Cordial *Medicines*, thoſe ſubſtances which, by their ſtimulant operation, excite an agreeable ſenſation of warmth in the ſtomach, and give it a temporary degree of tone. Hence they are alſo called *ſtomachic*. The ſenſation of warmth is produced partly by the peculiar impreſſion of theſe ſubſtances on the nervous coat of the ſtomach, and partly by the accelerated circulation in its veſſels, which neceſſarily occaſions a greater evolution of caloric. In conſequence of the general ſympathy of the different organs of the body with the ſtomach, this ſtimulant operation is communicated to the heart and arterial ſyſtem, and to the brain or common ſenſorium; whence the ſpirits are raiſed, a greater propenſity to motion and active thought is produced, and the general ſenſations of the whole frame are rendered more pleaſurable. That this extenſion of the effect takes place in conſequence of nervous ſympathy, and not by any actual communication of the cordial ſubſtance to the different parts by the veſſels, is evinced by the inſtantaneous manner in which it is effected. Farther than this, we know nothing of the mode in which this operation is accompliſhed; it can only be ſtated, as an ultimate fact, that ſuch a relation between the ſubſtances, which come under this denomination, and the living body, exiſts. No hypotheſis, ſuch as the older phyſicians adopted, of a chemical combination of the medicine with the fluids or ſolids of the body, or of a mechanical action of the one upon the other, renders the operation in the leaſt degree more intelligible.

Although the terms *Cardiac*, from the Greek, καρδια, and *Cordial*, from the Latin *Cor*, (both ſignifying *the heart*,) imply the ſame thing; yet a diſtinction ſeems to be generally made at preſent in their application: the term *cardiac* being confined more particularly to aromatic ſubſtances, and *cordial* being uſed, as including eſſential oils, vinous and ſpirituous liquors, and other diffuſible ſtimulants.

The operation of aromatic ſubſtances and eſſential oils is conſiderably different from that of vinous and ſpirituous liquors. The ſtimulus of the former is more confined to the ſtomach; they do not affect the ſenſorium, ſo as to produce intoxication; they leave a leſs uneaſy ſenſation, when their operation ceaſes, and therefore produce leſs neceſſity for a repetition; and they are much leſs pernicious to the conſtitution, as they do not ſeem, when taken in exceſs, to occaſion thoſe morbid derangements of the viſcera, (eſpecially of the liver,) which are among the moſt common and fatal conſequences of the abuſe of wine and ſpirits.

Cordials, in moderate quantities, are beneficial in debilitated habits, eſpecially where the digeſtive powers are weak. They give a temporary ſtrength to the ſyſtem; and, by their ſtimulus to the ſecretory veſſels of the ſtomach, they increaſe the ſecretion of the gaſtric fluid, and thus, by promoting the formation of a nutritious chyle, tend to add a permanent ſtrength to the body.

In the treatment of particular diſeaſes, they may be advantageouſly combined with the more permanent tonics, as in hyſteria, chloroſis, epilepſy, and ſome others, in which great nervous mobility prevails; with diuretics, in the dropſies of old people and of debilitated conſtitutions; and with narcotic medicines, ſuch as digitalis, cicuta, &c. which are liable to excite nauſea, or otherwiſe to diſagree with the ſtomach. In the laſt ſtages of putrid diſeaſes, as they are commonly called, ſuch as typhous fever, putrid ſore-throat, confluent ſmall-pox, &c. they are of incalculable utility, (particularly wine,) and afford the laſt reſources for ſupporting the ſinking powers of life, and for ſuſtaining that force and regularity of circulation, which is neceſſary to the performance of the functions.

**Cardiac** *orifice*, of the ſtomach, in *Anatomy*, is the opening by which the œſophagus communicates with that receptacle. It is called alſo the œſophageal, the ſuperior, or the left opening of the ſtomach. See Stomach.

**Cardiac** *opening* of the diaphragm, is the ſuperior of the two openings formed between the appendices or crura diaphragmatis, and tranſmits the œſophagus, together with the right and left nerves of the eighth pair, or par vagum. See Diaphragm.

**CARDIACA**, in *Botany*, Hall. Helv. n. 274. See Galeobdolon.

**Cardiaca**, Hall. Helv. n. 275. See Stachys *ſylvatica*.

**Cardiaca**, Amm. Ruth. 49, 50. Mil. Icon. 80. See Leonurus *tataricus*.

**Cardiaca**, ſive Leonurus. Pluk. Alm. 81. tab. 118. *fig.* 4. See Phlomis *zeylanica*.

**Cardiaca**, Herm. Lugd. 115. tab. 117. See Phlomis *repetifolia*.

**CARDIACUS** *Plexus*, in *Anatomy*, is formed by the nerves which ſupply the heart, and which are derived from the ſuperior and inferior cervical, and firſt dorſal ganglia of the great ſympathetic nerve, from the par vagum and the recurrent nerve. See Heart and Nerves.

**CARDIALGIA**, in *Medicine*, a term formerly uſed in a more general ſenſe to deſignate any pain or uneaſineſs about the region of the ſtomach, eſpecially if connected with a tendency to ſyncope (Sauvages Noſol. Meth. cl. vii. ord. 4.); but at preſent confined to that painful ſenſation of heat and acrimony about the ſuperior orifice of the ſtomach, which, from the vicinity of its ſeat to the heart, is popularly called *heart-burn*. The term is from καρδια, which ſignifies both the *heart*, and upper orifice of the ſtomach, and αλγος, *pain*.

This painful ſenſation is produced by the irritation of an *acid* matter in the ſtomach, which riſes to the upper orifice, ſometimes by eructation into the œſophagus and throat, and is ſometimes completely ejected by vomiting. That this irritating matter is of an acid nature, is evinced by the taſte; and it has even been ſeen to produce an effervеſcence on falling on a marble hearth, according to Dr. Darwin, (Zoonomia, claſs I. 2, 4, 5.). When vomited, or raiſed by eructation, it is ſometimes ſo intenſely ſour, as to abrade the mouth and throat; and, in general, it produces a ſenſation in theſe parts ſimilar to that which exiſts in the ſtomach.

The production of the acid is thus accounted for. It has been aſcertained by the experiments of Spallanzani and others, that the proceſs of digeſtion is effected by means of the ſolvent powers of the gaſtric juice; and that, during health, while it is perfectly performed, no degree of fermentation occurs. But when, from a deficiency of the ſolvent fluid, or ſome morbid change in its qualities, digeſtion is delayed or imperfectly accompliſhed, the natural chemical changes, which a maſs of animal and vegetable matter is diſpoſed to undergo, enſue, fermentation takes place, and an acid is conſequently evolved. It is obvious, therefore, that cardialgia is not to be conſidered as a diſtinct ſpecies of diſeaſe, but as one of the ſymptoms of indigeſtion, or of the weakneſs or inactivity of the ſtomach; and it is produced by all the cauſes of indigeſtion. See Dyspepsia. Particular kinds of food, however, are liable to produce cardialgia, in thoſe who are pre-diſpoſed to indigeſtion, rather than the other ſymptoms which often attend it; ſuch are hot new bread, eſpecially of the coarſer kinds, rich paſtry, &c. It is a very common ſymptom of that morbid condition of the ſtomach, which exiſts in the early and laſt ſtages of pregnancy.

The complaint may be palliated by mucilaginous matters, ſuch as Spaniſh liquorice, or gum Arabic, which ſheath the irritated parts, and, by ſupplying the deficiency of mucus, preſerve the ſenſible membranous lining of the ſtomach from the acrimonious fluid.

It may be certainly relieved, and, if ſlight, may be effectually cured, by the uſe of ſuch medicines as may combine with, and neutralize the acid, from which it originates. For this purpoſe the vegetable or foſſil alkalies may be employed in various forms; the ſoda-water, as a common drink, is a convenient form: the abſorbent earths, as magneſia, chalk, &c. will anſwer a ſimilar end. But where the complaint is ſevere, or of ſome ſtanding, the only effectual method of cure conſiſts in removing that ſtate of debility of the ſtomach on which the indigeſtion depends. This muſt be effected by temperance and exerciſe, with the aſſiſtance of tonic and ſtimulant medicines, ſuch as ſteel, colombo, and other bitters, with a moderate portion of wine and aromatics. Care ſhould be taken not to charge the ſtomach with a larger quantity of food than it can readily digeſt, ſince the overplus will neceſſarily tend to fermentation.

Dr. Darwin remarks, that as the ſaliva, ſwallowed along with our food, prevents its fermentation, according to the experiments of Pringle and Macbride, conſiderable relief is ſometimes found by chewing parched wheat or maſtic, or a lock of wool, frequently in a day, when the pain occurs, and by ſwallowing the ſaliva thus effuſed.

CARDIFF, or CAERDYFF, in *Geography*, the county-town of Glamorganſhire, South Wales, derives its name from its ſituation on the river Taf, which runs along the weſt ſide of it, and falls into the Severn, three miles below the town. It conſiſts of ſeveral ſpacious ſtreets of well-built houſes, and is pleaſantly ſituated on a fertile flat, two miles and a quarter from the eaſtern extremity of the county, where it is joined by Monmouthſhire. The town was formerly ſurrounded with walls flanked with watch-towers, 1280 paces in circumference, and had gates at the four cardinal points, ſome traces of which are ſtill viſible. Cardiff conſiſts of two pariſhes, St. John's and St. Mary's, though there is at preſent but one church: for the church of St. Mary was, in 1607, undermined and thrown down by the inundations of the river, which ſtill occaſionally repeats its depredations. The high tower of the preſent church was built, it is ſaid, at the latter end of the reign of Edward III. It is of light appearance, and of elegant workmanſhip: having open corners and lantern pinnacles. Here were formerly four religious houſes: a benedictine priory, and houſes of black, grey, and white friars. Thoſe of black and white friars were founded by Robert earl of Glouceſter, and continued, till the diſſolution, under Henry VIII. A few remains of the white friars are ſtill to be ſeen; and the ruins of the black friars are near the eaſtern wall and gate-way, and furniſh habitations for a few poor fiſhermen. The chief object of attention is the ancient caſtle, which is a large, ſtately edifice, on the north ſide of the town wall. It was originally of great ſtrength, and is ſaid to have covered eight acres of ground. It was built by the conqueror Fitzhamon, in 1090, after he had poſſeſſed himſelf of the country of Morgannoc. The entrance is by a bold gate-way, furniſhed with two portculliſſes and maſſy gates. The ruins of the caſtle have been repaired and modernized under the preſent poſſeſſor, the marquis of Bute. On the keep, which ſtands in the centre of the incloſed area, is a handſome octangular tower; and a high terrace is carried round the inſide of the whole extent of the embattled walls that ſurround it. This caſtle, ſituated in the midſt of the Anglo-Norman territory, experienced but few of thoſe incidents ſo common to many others. It is memorable as the ſcene of the unjuſt impriſonment and death of Robert duke of Normandy, by his brother Henry I. In May 1645, it was garriſoned by the Welſh loyaliſts for the king; but in Auguſt the following year, after ſuſtaining a ſhort ſiege, ſurrendered to the parliamentary forces. The inhabitants of Cardiff and its vicinity carry on a conſiderable trade to Briſtol, and ſend thither great quantities of oats, barley, ſalt butter, and poultry of all kinds. The iron-works of the adjacent country have greatly added to the conſequence of this town, nearly 9000 tons of caſt and wrought iron being exported annually for London and other places. By an act which paſſed in 1790, a canal was cut from Penarth Point to the Cyfartha iron-works, near Merthyr Tidvil; which has greatly facilitated the conveyance of ſo ponderous an article of commerce to market: this canal was brought, with great ingenuity, through a mountainous country, to the extent of twenty-five miles; its head, at Merthyr Tidvil, is 568 feet higher than the tide lock at Cardiff. By a ſubſequent act a branch has been extended to other works at Aberdare, while the diviſion of the line below the town has been widened and depened, ſo as to admit brigs and other veſſels of 300 tons burthen up to the quay. See *Glamorganſhire* CANAL. The aſſizes are regularly held at Cardiff; and the beauty of the neighbourhood is ſometimes diſplayed at its concerts and aſſemblies. By the late return the population of this town is 1870, and the number of houſes 327. It is 160 miles W. from London, and has two weekly markets on Wedneſdays and Saturdays.

About three leagues ſouth of Cardiff are two iſlands, called the Flat and Steep Holmes; on the former of which there is a light-houſe, and a good dwelling, where pilots frequently wait to conduct ſhips up the Briſtol channel: this iſland contains ſixty acres of land, and is well cultivated. A little to the weſt of theſe iſlands is a ſmall one called Sully; and three miles weſtward of that is another named Barry, from St. Baruch, who is ſaid to have been interred there. Evans's Tour through South Wales, 8vo. 1804. Malkin's Scenery, Antiquities, &c. of South Wales, 4to. 1804.

CARDIGAN, in Welſh *Aberteivi*, is the county-town of Cardiganſhire, in South Wales. The houſes ſtand on the declivity of a hill, at the bottom of which runs the river Teifi or Tivy, which has at its mouth a dangerous bar. This is navigable at high tides for brigs of 150 tons burthen, which are laden and unladen at the quay. Previous to the war here was a conſiderable export trade to Ireland, &c. in lead and corn; but the iron works in the vicinity furniſh it, at preſent, with its chief commerce. About two miles from the town the river diſcharges itſelf into Cardigan-bay. A bridge of ſeven arches croſſes the river, and near it ſtands the ſhell of a caſtle, which is ſaid by many writers to have been built by Gilbert de Clare, who alſo fortified the town, in the time of Henry II. Powel, however, in his "Hiſtory of Wales," aſſerts, that a caſtle was built here, in 1155, for the defence of the borders. This was beſieged by Rhys Gryffydd, in 1164, when it was taken, and razed to the ground. In 1176, Cardigan was a ſcene of peculiar public feſtivity, when numbers of Engliſh, Welſh, Iriſh, and Normans, aſſembled to celebrate a grand eiſteddfod. The bards and minſtrels of the principality diſplayed pre-eminent ſkill on this occaſion. They, conſequently, record the approbation and thanks of the aſſembly; and, being victors, were rewarded with honorary preſents. In the poetical claſs, the bards of North Wales were declared the moſt eminent; and, in muſic, the minſtrels of South Wales proved themſelves the conquerors.

On the banks of the river ſtands the church, a large handſome ſtructure; and near it are the ruins of a priory of black canons. In 1797, a new county-gaol was erected in this town. Cardigan is noted as the place where Gyraldus preached, and ſtrongly recommended the cruſade to the ancient Britons. Though the county-town, Cardigan has but little to recommend it to the attention of the hiſtorian or antiquary. Its houſes and ſhops are upon a very ſmall ſcale, and its local trade is but very inconſiderable. In conjunction with the outlying boroughs of Aberyſtwith, Lampeter, and Adpar, this town ſends one member to parliament. The number of voters amounts to about 1200. Cardigan gives the title of earl to the family of Brudenel. Here are a weekly market on Tueſdays, and four fairs yearly. Evans's Tour through South Wales, 8vo. 1804. Malkin's Scenery, Antiquities, &c. of South Wales, 4to. 1804.

Cardigan, a name once given to the townſhip Orange, in America, about 20 miles E. of Dartmouth college, in New Hampſhire. See Orange.

Cardigan *bay*, a bay of the Atlantic, on the weſt coaſt of Wales, W. and N.W. of the town of Cardigan. This bay is very extenſive, and is bounded by the coaſt of Pembroke which forms one horn of it, and by the extreme point of Caernarvonſhire terminating in the iſle of Bardſea, which forms the other.

CARDIGANSHIRE, a county of South Wales, is a long narrow diſtrict bordered to the weſt by that part of St. George's channel, called Cardigan-bay. On this coaſt the ſea has made great encroachments, and according to the tradition of the country, a large tract of land, well inhabited, has been ſwept away by the waves. This coaſt is particularly animadverted on by ſome of the ancient Welſh bards. The other boundaries of the county are, Merionethſhire and Montgomeryſhire on the north, Radnorſhire and Brecknockſhire on the eaſt, and Caermarthenſhire and Pembrokeſhire on the ſouth. The area meaſures about 40 miles in length, by 20 in breadth. This diſtrict is divided into five hundreds; and contains ſix market-towns, and 64 pariſhes, which are included in the dioceſe of St. David's. Cardiganſhire may be properly divided into two diſtricts, and characterized by the lower, and the upland. The higher grounds of the former conſiſt of a light ſandy loam, varying in depth from twelve to four and five inches; the ſubſtratum is a ſlaty kind of rock. The ſoil of the upland diſtrict is extremely ſhallow, and in general very barren. Indeed this mountainous region is naturally uncongenial to the purſuits of agriculture; yet the genius and induſtry of men might effect much, particularly by judicious plantations. This is laudably exemplified in the grounds at and about Hafod, where the patriotic proprietor, Thomas Johnes eſq., has rendered fertile and uſeful many thouſand acres of land. The ſcenery of Hafod, the Devil's bridge, and their vicinities, is ſingularly grand, pictureſque, and romantic. This northern part of the country abounds with deep narrow chaſms between the mountains, through which the waters often ruſh with great impetuoſity; and particularly after ſtorms, or continued rains, when they form immenſe torrents, and in many places are precipitated in roaring caſcades. "The whole of this rugged region," obſerves Mr. Malkin, "is one immenſe reſervoir of metallic treaſure, awaiting only the ſpirit of enterpriſe, and the hand of induſtry to draw it into light and uſe;" but the purſuits of agriculture have hitherto ſuperſeded thoſe of commerce. The principal rivers of this county are the Rydol, the Yſtwith, and the Clewedog. Malkin's Scenery, Antiquities, &c. of South Wales, 4to. 1804.

CARDINAL, a term ſerving to expreſs the relation, or quality of prime, principal, or moſt conſiderable. The word is formed of the Latin *cardo, a hinge;* it being on theſe fundamental points that all the reſt of the ſame kind are ſuppoſed to turn. Thus, juſtice, prudence, temperance, and fortitude, are called the four *cardinal virtues*, as being the baſis of all the reſt.

Cardinal *flower*. See Lobelia Dortmanni.

Cardinal *Points*, in *Coſmography*, are the four interſections of the horizon with the meridian and the prime vertical circle. Of theſe, two, viz. the interſections of the horizon and meridian, are called *North* and *South*, with regard to the poles they are directed to.

To determine the places of theſe points, ſee Meridian *line*.

The other two, viz. the interſections of the horizon and firſt vertical, are called *Eaſt* and *Weſt*.

The cardinal points, therefore, coincide with the four cardinal regions of the heavens; and are 90° diſtant from each other. The intermediate points are called collateral points.

Cardinal *Points of the Heavens*, or, *of a Nativity*, in *Aſtrology*, are the riſing and ſetting of the ſun, the zenith and nadir.

Cardinal *Signs*, in *Aſtronomy*, are Aries, Libra, Cancer, and Capricorn. See Sign.

Cardinal *Winds* are thoſe that blow from the cardinal points.

Cardinal *Numbers*, in *Grammar*, are the numbers one, two, three, &c. which are indeclinable; in oppoſition to the ordinal numbers, firſt, ſecond, third, fourth, &c. See Number.

Cardinal is more particularly uſed for an eccleſiaſtic prince, one who has a voice, both active and paſſive, in the Roman conclave, at the election of a pope.

Some ſay, the cardinals were ſo called from the Latin *incardinatio*, which ſignifies the adoption in any church made of a prieſt of a foreign church, driven thence by misfortune; and add, that the uſe of the word commenced at Rome and Ravenna; the revenues of the churches of which cities being very great, they became the common refuge of the unhappy prieſts of all other churches.

The cardinals compoſe the pope's council, or ſenate: in the Vatican is a conſtitution of pope John, which regulates the rites and titles of the cardinals; and which declares, that as the pope repreſents Moſes, ſo the cardinals repreſent the ſeventy elders, who under the pontifical authority decide private and particular differences.

Cardinals, in their firſt inſtitution, were only the principal prieſts, or incumbents of the pariſhes of Rome. In the primitive church, the chief prieſt of a pariſh, who immediately followed the biſhop, was called *preſbyter cardinalis;* to diſtinguiſh him from the other petty prieſts, who had no church, nor preferment; the term was firſt applied to them in the year 150; others ſay, under pope Silveſter, in the year 300. Theſe cardinal prieſts were alone allowed to baptize, and adminiſter the euchariſt. When the cardinal prieſts became biſhops, their cardinalate was vacated; they being then ſuppoſed to be raiſed to a higher dignity.—Under pope Gregory, cardinal prieſts, and cardinal deacons, were only ſuch prieſts or deacons as had a church or chapel under their particular care: and this was the original uſe of the word. Leo IV. in the council of Rome, held in 853, calls them *preſbyteros ſui cardinis;* and their churches *parochias cardinales*.

The cardinals continued on this footing till the eleventh century; but as the grandeur and ſtate of his holineſs became then exceedingly augmented, he would have his council of cardinals make a better figure than the ancient prieſts had done. It is true, they ſtill preſerved their ancient title; but the thing expreſſed by it was no more. It was a good while, however, before they had the precedence over biſhops, or got the election of the pope into their hands: but when they were once poſſeſſed of thoſe privileges, they ſoon had the red hat and purple; and growing ſtill in authority, they became at length ſuperior to the biſhops, by the ſole quality of being cardinals.

Du-Cange obſerves, that originally there were three kinds of churches: the firſt or genuine churches were properly called *pariſhes*; the ſecond, *deaconries*, which were chapels joined to hoſpitals, and ſerved by deacons; the third were ſimple *oratories*, where private maſſes were ſaid, and were diſcharged by local and reſident chaplains. He adds, that to diſtinguiſh the principal, or pariſh churches, from the chapels and oratories, the name cardinals was given them. Accordingly, pariſh churches gave titles to cardinal prieſts; and ſome chapels alſo, at length, gave the title of cardinal deacons.

Others obſerve, that the term cardinal was given not only to prieſts, but alſo to biſhops and deacons who were attached to certain churches; to diſtinguiſh them from thoſe who only ſerved them *en paſſant*, and by commiſſion. Titular churches, or benefices, were a kind of pariſhes, i. e. churches aſſigned each to a cardinal prieſt; with ſome ſtated diſtrict depending on it, and a font for adminiſtering of baptiſm, in caſes where the biſhop himſelf could not adminiſter it.—Theſe cardinals were ſubordinate to the biſhops; and, accordingly, in councils, particularly that held at Rome in 868, ſubſcribed after them. It was not, however, only at Rome, that prieſts bore this name; for we find there were cardinal prieſts in France; thus, the curate of the pariſh of St. John de Vignes is called, in old charters, the cardinal prieſt of that pariſh.

The title of cardinal is alſo given to ſome biſhops, *quatenus* biſhops; e. g. to thoſe of Mentz and Milan: the archbiſhop of Bourges is alſo, in ancient writings, called cardinal; and the church of Bourges a cardinal church. The abbot of Vendome calls himſelf *cardinalis natus*.

The cardinals are divided into three claſſes, or orders; containing ſix biſhops, 50 prieſts, and 14 deacons; making in all, 70: which conſtitute what they call the *ſacred college*. The cardinal biſhops, who are as it were the pope's vicars, bear the titles of the biſhopricks aſſigned to them; the reſt take ſuch titles as are given them; the number of cardinal biſhops has been fixed; but that of cardinal prieſts and deacons, and conſequently the ſacred college itſelf, is always fluctuating. Till the year 1125, the college only conſiſted of 52, or 53: the council of Conſtance reduced them to 24; but Sixtus IV. without any regard to that reſtriction, raiſed them again to 53, and Leo to 65. Thus, as the number of cardinal prieſts was anciently fixed to 28, new titles were to be eſtabliſhed, in proportion as new cardinals were created.—As for the cardinal deacons, they were originally no more than ſeven, for the 14 quarters of Rome; but they were afterwards increaſed to 19, and after that were again diminiſhed. It has been ſaid, however, (ſee Moſheim, E. H. vol. ii. p. 485.) that cardinal deacons were not from the beginning members of that ſacred college, by whom the popes were elected. Although there were in the Roman church long before the edict of Nicholas (mentioned below), and there ſtill remain, cardinal deacons, i. e. ſuperintendants of thoſe churches which have hoſpitals annexed to them, and whoſe revenues are appropriated to the ſupport of the poor; yet they were evidently excluded from the election of the pope, which, by the edict of Nicholas, was to be made by the cardinal biſhops and clerks alone. Accordingly we find the cardinals plainly diſtinguiſhed from the deacons in the diploma that was drawn up for the election of Gegory VII. to the pontificate.

According to Onuphrius, it was pope Pius IV. who firſt enacted, in 1562, that the pope ſhould be choſen only by the ſenate of cardinals: whereas, till that time, the election was by all the clergy of Rome. Some ſay, the election of the pope reſted in the cardinals, excluſive of the clergy, in the time of Alexander III. in 1160. And they allege, that, in order to avoid the uſual contentions and diſturbances at the election of a pope, he made a decree in the third Lateran council, A. D. 1179, that for the future the right of chuſing him ſhould be veſted in the cardinals only, and that he ſhould be a lawful pope who had the ſuffrages of two-thirds of the college of cardinals; which law is ſtill in force. See ALEXANDER. Others go higher ſtill, and ſay, that Nicholas II. having been elected at Sienna, in 1058, by the cardinals alone, occaſioned the right of election to be taken from the clergy, and people of Rome; only leaving them that of confirming him by their conſent; which was at length, however, taken from them. See his decree for this purpoſe, iſſued in the Roman council of 1059, in Hardouin's Acta Conciliorum, tom. vi. pt. i. p. 1165. "We have thought proper to enact," ſays the pontiff, "that, upon the deceaſe of the biſhop of the Roman catholic or univerſal church, the affair of the election be treated principally, and previouſly to all other deliberations, among the *cardinal biſhops* alone, who ſhall afterwards call in to their council the *cardinal clerks*, and require finally the conſent of the reſt of the clergy and the people to their election." Whence it appears, that the cardinals who had the right of ſuffrage in the election of his ſucceſſors, were divided by this pontiff into cardinal biſhops and cardinal clerks: meaning by the former the ſeven biſhops who belonged to the city and territory of Rome, and to whom it belonged to conſecrate the Roman pontiff; and by the latter, the cardinal preſbyters or miniſters of the 28 Roman pariſhes, or principal churches. To theſe were added, in proceſs of time, under Alexander III. and other pontiffs, new members, in order to appeaſe the tumults occaſioned by the edict of Nicholas II. Accordingly Alexander completed what Nicholas had only begun, by transferring and confining to the college of cardinals the right of electing to the apoſtolic ſee, and excluding the nobility, the people, and the reſt of the clergy from all concern in this important matter. In order to defeat the oppoſition of the higher order of clergy, he augmented the college of the electing cardinals by conferring that dignity upon the prior, or arch-preſbyter of St. John Lateran, the arch-preſbyters of St. Peter's and St. Mary Maggiore, the abbots of St. Paul's and St. Laurence without the wall, and, laſtly, upon the ſeven Palatine judges. And the inferior clergy were reduced to ſilence by the promotion of their chiefs, the *cardinal deacons*, to the dignity of electors. Who it was, whether Alexander III. or ſome other pontiff, that raiſed the principal Roman deacons to the rank of cardinals, is not certain; but it is very evident, that the deſign of this promotion was to put an end to the murmurs and complaints of the inferior clergy, who reſented highly the violation of their privileges.

We may conclude, upon the whole, that the college of cardinals, and the extenſive authority, and the important privileges enjoyed by them at this day, derive their origin from the edict publiſhed at the requeſt and under the pontificate of Nicholas II.; that, under the title of cardinals, this pontiff comprehended the ſeven Roman biſhops, who were conſidered as his ſuffragans, and of whom the biſhop of Oſtia was the chief, as alſo the 28 miniſters, who had inſpection over the principal Roman churches; and that to theſe were added, in proceſs of time, under Alexander III. and other pontiffs, new members, in order to appeaſe the reſentment of thoſe who looked upon themſelves as injured by the edict of Nicholas, and alſo to anſwer other purpoſes of eccleſiaſtical policy. It is alſo unqueſtionable, that, though the higher order of purpled prelates, commonly called cardinals, had its riſe in the 11th century, yet it does not

not ſeem to have acquired the ſtable and undiſputed authority of a legal council before the following age and the pontificate of Alexander III. See Conclave.

The cardinals obtained the privilege of wearing the red hat as an emblem of their readineſs to ſhed their blood for the catholic faith, in conſequence of the grant made to them by Innocent IV. at the council of Lyons, in 1245; but they are ſaid to have firſt uſed it in the year after the council, i. e. in 1246, on occaſion of an interview between the pope and Lewis IX. of France. That the cardinals were allowed to wear red ſhoes and red garments in the time of Innocent III. raiſed to the ſee in 1198, appears from ſeveral writers who flouriſhed at that time; but it is not certain which of the popes conferred upon them that diſtinction. Paul II. elected to the papacy in 1464, added the red cap and ſcarlet houſings for capariſoning their horſes when they rode. The decree of pope Urban VIII. whereby it is appointed, that the cardinals be addreſſed under the title of *eminence*, is of the year 1630; till then, they were called *illuſtriſſimi*.

See further concerning the origin and rights of cardinals in Onuphrius, Duarenus, Ciaconus. Aubery has given the general hiſtory of cardinals, in five volumes, 4to.

Cardinal has alſo been applied to ſecular officers.

Thus, the prime miniſters in the court of the emperor Theodoſius, are called *cardinales*. Caſſiodorus, lib. vii. Formul. 31. makes mention of the cardinal prince of the city of Rome; and in the liſt of officers of the duke of Bretagne, in 1447, we meet with one Raoul de Thorel, cardinal of Quillart, chancellor, and ſervant of the viſcount de Rohan: which ſhews it to have been an inferior quality.

Cardinal's *iſland*, in *Geography*, a ſmall iſland near the eaſt coaſt of Labrador. N. lat. 59° 30′. W. long. 63° 50′.

Cardinal *bird*, in *Ornithology*, ſynonymous with *Cardinalitius* and *Loxia cardinalis*.

CARDINALIS *capitis bonæ ſpei*, Briſſ. and Cardinal *du cap de bonne eſpèrance*, Buff. See Loxia *orix*, the grenadier of Engliſh writers. *Le cardinal* of Buffon is another bird, the Gmelinian Tanagra *braſilia*, which ſee. *Cardinalis purpureus* of Briſſ. is the *Jacapu* of Marcgrave, *Tanagra jacapa* of Gmelin. *Cardinalis* is alſo the ſpecific name of ſeveral birds in the Linnæan ſyſtem, as will be noticed in their reſpective genera.

CARDINALITIUS, a name given by ſome to the Virginian nightingale, Loxia *cardinalis*, which ſee.

CARDING, in the *Manufactories*, a preparation of wool, cotton, hair, or flax, by paſſing it between the iron points, or teeth, of two inſtruments, called *cards*, to comb, diſentangle, and range the hairs or fibres thereof; and to diſpoſe it for ſpinning, &c. See Cards.

Before the wool be carded, it is oiled, or greaſed with oil; whereof, one-fourth of the weight of the wool is required, for wool deſtined for the woof of ſtuffs; and one-eighth for that of the warp. See Cloth.

CARDIOGMUS, or Cardionchus, (compounded of καρδία, *the heart*, and ὄγκος, *tumour*) in *Medicine*, a dilatation of one or all the cavities of the heart. The term includes two ſpecies of diſeaſe; viz. a partial enlargement of the heart, forming a ſac, in which coagulable lymph is depoſited, and which is uſually denominated aneuryſm of the heart; and that more common diſeaſe, which conſiſts ſimply in a general dilatation of the natural cavities.

The ſymptoms which belong to aneuryſm of the heart are the ſame as thoſe which accompany aneuryſm of the arch of the aorta. (Baillie Morb. Anat. p. 42.) See Aneurysm.

When the heart, or any of its cavities, is much enlarged, it is attended with ſevere palpitations, which are excited by the leaſt motion or exertion, and often increaſe to the moſt violent and diſtreſſing paroxyſms; ſo that they may not only be felt by the hand, when applied to the left ſide, but at the pit of the ſtomach, and at the top of the ſternum; and they may frequently be perceived by the eye through the ordinary clothing, and occaſionally, it is ſaid, may even be heard. The other ſymptoms are, a ſenſe of weight, and a conſtant anxiety about the cheſt; ſometimes accompanied with a violent pain acroſs the breaſt, in the abdomen, or the back; and ſometimes with fainting. There is frequently great difficulty of breathing, with a ſenſe of ſuffocation, which compels the patient to ſit in the erect poſture, or to ſeek repoſe by leaning on his breaſt. A purpliſh hue of the cheeks and lips, which varies at times, according to the degree of difficulty with which the blood is tranſmitted through the lungs; œdema of the face, or other dropſical ſwellings; flatulence of the ſtomach; and a haraſſing cough, are occaſional ſymptoms of the complaint. The pulſe is various in different inſtances; ſometimes it is feeble, ſmall, and intermitting; ſometimes extremely quick and hard; and ſometimes not ſynchronous with the contractions of the heart. When the palpitation is violent, the head is often affected with ſtrong diſtreſſing pulſations, which are ſometimes more complained of than thoſe of the heart itſelf.

The *diagnoſis* of this affection of the heart is of conſiderable importance; becauſe the moſt dreadful palpitations occaſionally ariſe from morbid irritability, independent of organic diſeaſe; and the treatment muſt neceſſarily be very different in the two inſtances. The enlargement of the heart is generally perceptible to the hand; its ſtroke is leſs pointed, or more obtuſe than natural, and is felt two or three ribs lower than in health. But, according to Dr. Ferriar, "the moſt certain ſign of dilatation is the jarring ſenſation given to the hand by each ſyſtole. The ſtroke ſeems reſtrained, and is ſucceeded by a kind of thrilling, which cannot be clearly deſcribed, but is entirely different from the ſhake of a palpitation." (Med. Hiſt. and Reflect. vol. i. p. 148.) Senac, with leſs diſcrimination, obſerves, that our principal guide, in determining the dilatation of the heart, muſt be the force of the palpitations, their continuance, and the facility with which they are excited, eſpecially if accompanied by ſyncope and dyſpnœa. (Traité du Cœur, tom. ii. chap. 8.) The ſymptoms, however, are ſometimes obſcure and treacherous.

It is more difficult, and of leſs importance, to determine which of the cavities of the heart is dilated. Where the auricles only are dilated, probably the pulſe will retain its ſtrength, as the ventricles poſſeſs their natural power; the palpitation will perhaps be leſs violent; and the enlargement leſs perceptible to the hand. (Senac.) And the dilatation may be conſidered as confined to the auricles, when the pulſation feels remote, and extending acroſs the breaſt, as well as downwards, and when the apex of the heart does not ſtrike the ribs very forcibly. (Ferriar.) M. Senac has farther obſerved, that when the right ventricle, or its auricle, is greatly dilated, the palpitations are comparatively trifling; the patients complain chiefly of a ſenſe of weight about the region of the heart; and there is alſo a pulſation in the veins of the neck.

In ſeveral inſtances there has been a great diſpoſition to gangrene in the extremities, which no medicine could counteract. This ariſes, no doubt, from the impaired force of the heart. For as its muſcular *parietes* are generally very thin, in proportion to the enlarged ſize of its cavities, the heart has little power to propel an increaſed quantity of blood into the more diſtant branches of the arterial ſyſtem. (Morb. Anat.)

In whatever cavity the dilatation exiſts, the diſeaſe is commonly fatal. The patients generally die ſuddenly, in ſyncope, or in a paroxyſm of palpitation ; ſometimes in conſequence of a rupture of the thin *parietes* of the dilated cavity ; but often without any ſuch rupture. The diſeaſe, however, is extremely irregular in its progreſs, and various in its duration. It will ſometimes appear to be ſtationary, or even retrograde, for a long interval, during which the ſenſations of the patient are tolerably comfortable, and he can uſe moderate exerciſe without inconvenience. At other times the paroxyſms are frequent, and he ſeems in perpetual danger of expiring. The duration of the complaint has been obſerved, in different inſtances, to vary from two or three months to nine years.

Various *cauſes* have been aſſigned for this diſeaſe. Senac enumerates in the liſt, all acute diſeaſes of the lungs, as well as aſthma and hydrothorax, fever, violent exerciſe, or turbulent paſſions, and exceſſive intemperance. According to Lanciſi, flute-players and preachers are ſubject to it ; and Dr. Pitcairn thinks that he has obſerved it to ariſe from a transferrence of rheumatiſm to the heart. Dr. Ferriar has ſeen it produced by raiſing great weights, or by too long a continuance of much bodily exertion ; and all the caſes which he has ſeen have been in *young* perſons. It is probable that any circumſtance which either acts as a ſtrong impediment to the free paſſage of the blood from the heart, or which excites a violent and long-continued afflux of blood to that organ, may, in ſome conſtitutions, where there is an original weakneſs of it, occaſion a dilatation.

Little can be ſaid as to the *cure* of dilatation of the heart ; for, except in the incipient ſtage, all that can be done is to ſoothe the diſtreſſing feelings of the patient, to render his exiſtence ſomewhat more comfortable, and thus perhaps to prolong its duration. With this view, much has often been done by medicine and proper management. The anxiety and palpitation may be alleviated by means of narcotic medicines, eſpecially by digitalis and opium, which diminiſh the irritability of the heart and arterial ſyſtem. The digitalis is ſometimes extremely uſeful in this complaint, and has appeared to ſuſpend its progreſs, and to produce long intervals of freedom from the diſtreſſing ſymptoms. Perhaps it may be ſerviceable partly as a narcotic, and partly as a diuretic ; ſince diuretics, whatever may be the explanation, give frequent relief in diſorders of the cheſt. All violent exerciſe, and great emotions of the mind, ſhould be avoided, ſince they tend to produce inordinate action of the heart. Moderation in diet ſhould be obſerved, and ſtrong liquors diſpenſed with ; ſo that the ſtomach may not, by diſtention, preſs upon the heart, and excite it to increaſed action, and that the body be not heated and ſtimulated by the quantity or quality of the food and drink. Great flatulence, or other occaſional ſymptoms, muſt be palliated by appropriate medicines.

It ought not to be omitted, that in the commencement of the diſeaſe ſome phyſicians have recommended evacuations, eſpecially by bleeding, with a view to remove the fulneſs of the veſſels, and therefore to diminiſh the mechanical momentum of the blood in the heart, as well as its ſtimulus to that irritable organ. This doctrine is, however, ſomewhat queſtionable. It is juſtly remarked by Dr. Ferriar, that the ſymptoms of debility which generally accompany the complaint, even at its commencement, the tendency to deliquium (fainting), the weak flatulent ſtate of the ſtomach and bowels, the dropſical ſymptoms, owing to a delay in the return of the blood, and the languid feelings of the patient, ſeem to point out a *careful* exhibition of tonics, as the moſt probable means of arreſting the progreſs of the diſorder. Analogy corroborates this ſuggeſtion ; for in other partial congeſtions, and in palſies, tonics, and even direct ſtimulants, are given with advantage, to recover the tone of the dilated or ruptured veſſels. (Ferriar, loc. cit. p. 168.)

CARDIOIDE, in *Geometry*, a curve ſo called by Caſtilliani. It is thus formed ; let the diameter A B (*Plate* III. *Geometry*, *fig.* 48.) of the circle A M B A, revolve about the point A, and on A B produced let B *a*, M N, A D, M N, &c. be always equal to A B ; then will the point *a* deſcribe a curve, which from its figure reſembling a heart, is called *cardioide*.

From the conſtruction it appears, that A N = B A + A M, and that N M A N is always double of the diameter A B, and is biſected by the circle in M.

This curve is algebraical ; if A B $= a$, $a$ E $= x$, E N $= y$, its equation will be,

$$\begin{aligned} y^4 - 6ay^3 + 12x^2y^2 - 6ax^2y + x^4 \\ + 12a^2y^2 - 8a^3y + 3a^2x^2 = 0 \end{aligned}$$

For the method of drawing tangents, and other properties of this curve, ſee Phil. Tranſ. N° 461. ſect. 8. See alſo Mem. Acad. Scienc. 1705, where M. Carré firſt propoſed this curve.

CARDIOSPERMUM, in *Botany*, (καρδια, *heart*, σπερμα, *ſeed*, from a heart-ſhaped ſpot or ſcar on the ſeed). Linn. gen. 498. Schreb. 680. Willd. 789. Gært. 497. Juſſ. 146. Vent. 3. 126. (*Corindum*, Tourn. La Marck Encyc. *Veſicaria*, Riv. 4. 144.) Claſs and order, *octandria trigynia*. Nat. ord. *trilobatæ*, Linn. *Sapindi*, Juſſ. *Saponaceæ*, Vent.

Gen. Ch. *Cal.* perianth four-leafed ; leaves obtuſe, concave ; the alternate interior ones larger than the others. *Cor.* petals four, obtuſe, alternate with the leaves of the calyx, equal in ſize to the two larger ones. *Nectary* four petal-ſhaped leaflets, coloured, incloſing the germ, ſhorter than the proper petals, and attached to them ; two of them callous at the tip, hooked at the ſide, forming an upright lip ; the others with equal ſides forming a cloſed lip. *Stam.* filaments eight, awl-ſhaped, nearly as long as the nectary, united below ; anthers ſmall. *Piſt.* germ three-ſided ; ſtyles three, ſhort ; ſtigmas ſimple. *Pericarp.* capſule roundiſh, three-lobed, inflated, three-celled, opening at the tip. *Seeds* globular, marked at the baſe with a heart-ſhaped ſcar. Gærtner and La Marck conſider the fruit as conſiſting of three connate, one-celled, valveleſs capſules, united at the axis ſo as to take the appearance of a three-lobed capſule.

Eſſ. Ch. Calyx four-leafed. Petals four ; nectary four-leafed, unequal. Capſule three-lobed, or rather three connate capſules inflated.

Sp. 1. C. *halicacabum*, Linn. Sp. Pl. Lam. Ill. Pl. 317. Gært. Pl. 79. (*Halicacabum*, Rumph. Amb. 6. p. 60. tab. 24. fig. 2. *Piſum veſicarium*, Bauh. pin. 743. Sloane Hiſt. 1. p. 238.) " Stem and petioles ſmooth ; leaflets with gaſhed teeth, ſmooth." Willd. *Root* annual. *Stems* three or four feet long, ſlender, branched, ſtriated, twining. *Leaves* alternate, twice ternate, ſometimes ſlightly pubeſcent. *Flowers* ſmall, white ; common peduncles axillary, ſolitary, thread-ſhaped, furniſhed above the middle with two ſimple, oppoſite tendrils, and ſupporting ſeveral flowers near their extremity on ſhort partial peduncles. *Fruit* ſhort, greeniſh, almoſt ſmooth. A native of the Eaſt and Weſt Indies ; cultivated in England by Gerard in 1594. It flowers here in July. 2. C. *hirſutum*, Willd. " Stem and petioles hairy ; leaflets toothed, ſmooth." *Root* annual. *Stem* four feet high or more, climbing, deeply furrowed, thick ſet with hairs. *Leaves* alternate, petioled, twice ternate ; leaflets egg-ſhaped, acuminate, two inches and a half long, half an inch broad, ſimply and coarſely toothed, ſmooth on both ſides, veined ; axils of the veins pubeſcent beneath ; common petiole almoſt three inches long, furrowed, hairy ; partial petiole an inch or half an inch long, ſemicylindrical, not often beſet with hairs. *Flowers* ſimilar to thoſe of the preceding ſpecies, but larger ; peduncles half a foot long, furrowed, ſmooth. A native of Guinea. 3. C. *corindum*, Linn. Sp. Pl. “ Leaves downy underneath.” Similar to C. *halicacabum*. *Root* annual. *Peduncles* ſupporting ten or eleven flowers among the tendrils, remaining, after the fructification is paſt, rigid. *Capſules* narrower, downy. A native of Braſil. 4. C. *grandiflorum*, Willd. Swartz. Prod. 64. Flor. Ind. Occid. 2. p. 698. “ Leaves pubeſcent ; capſules acuminate, very large.” *Root* perennial. *Leaves* more acuminate than thoſe of C. *corindum*, and not inclining to heart-ſhaped at the baſe. *Flowers* and *fruit* three or four times as large. A native of Jamaica.

CARDISPERMUM. See Calendula *hybrida*.

CARDISSA, in *Conchology*, the name given by Rumpfius to the Linnæan *Cardium cardiſſa*.

CARDITIS, in *Medicine*, the noſological term for inflammation of the heart.

If we conſider the nature and importance of the function of the heart, and the connection of the circulation, of which it is the ſource, with the nervous ſyſtem, the ſtate of temperature, and every other function of the body, we ſhould be led to expect, *à priori*, that the ſymptoms accompanying an inflammation of that organ, would be ſufficiently obvious, and eſſentially different from thoſe, which deſignate an inflammation of any other of the viſcera of the thorax. This, however, is very far from being the caſe. The ſymptoms which attend inflammation of the heart, are fever, pain in the ſituation of the heart, palpitations, an irregular pulſe, cough, difficulty of breathing, and often ſyncope. (Baillie Morb. Anat. p. 42.) It is obvious that the ſymptoms here enumerated are merely the common ſymptoms of peripneumony, or pleuriſy, with the addition of palpitation, irregularity of pulſe, and ſyncope, or fainting. But it is obſerved by Senac, that theſe ſymptoms are extremely uncertain ; and with regard to palpitation, although its preſence may lead us to ſuſpect that the heart is affected, yet it is probably an hypothetical opinion, ſince in that inflammation, which ariſes from wounds of the heart, palpitation does not occur. (Traité du Cœur, tom. ii. chap. 7.) With reſpect to the other two ſymptoms it muſt be remarked, that the preſence of an irregular pulſe, and the occurrence of ſyncope, together with the ſymptoms of pneumonia (or inflammation of the lungs), can only lead to a probable ſuſpicion of an affection of the heart ; ſince they are by no means conſtant attendants on carditis ; and the former very frequently attends other caſes of pneumonia. (Wilſon on Febrile Diſeaſes, vol. iv.) Upon the ſame grounds Dr. Cullen accords with the obſervations of Vogel, that “ the ſymptoms of carditis are nearly the ſame with thoſe of peripneumony, but in general more ſevere ;” and adds, that he has ſeen the *pericardium*, or membranous covering of the heart, inflamed, when no other ſymptoms, but thoſe of peripneumony, had occurred. (Synopſis Noſol. Meth. p. 107. note.) Inflammation of the pericardium, however, cannot be diſtinguiſhed in practice from inflammation of the ſubſtance of the heart. (Baillie, loc. cit.) In fact, inflammation ſeldom occurs in any part of the contents of the thorax, without ſpreading to thoſe in contact with it, as from the pleura to the lungs, from the heart to the pericardium and pleura, &c. Hence the diagnoſis muſt be obviouſly impoſſible in many caſes, where in reality more than one organ is inflamed.

Were we in poſſeſſion, however, of any certain means of diſtinguiſhing carditis from inflammation of the other thoracic viſcera, in a practical point of view it would be of little uſe, ſince the method of *cure* muſt be the ſame, whether the diſeaſe be ſeated in the lungs, pleura, heart, or pericardium. General blood-letting, where the pulſe is hard and ſtrong ; bliſters to the region of the heart ; gentle laxatives of calomel or neutral ſalts ; diaphoretics ; and diluents ; will be the principal expedients : every thing being at the ſame time avoided which can increaſe the local or general irritation.

The ſame *cauſes* muſt be conſidered as giving riſe to carditis, which produce the other modifications of thoracic inflammation ; and the ſame circumſtances will direct us in forming our *prognoſis*, and in adopting particular varieties of treatment. See Peripneumony.

It would appear from diſſections, that there is often a ſlow or chronic inflammation ſubſiſting in the heart, which does not betray itſelf by any peculiar ſymptom. For abſceſſes in the ſubſtance of the ventricles, and ulcers on the external ſurface, have been occaſionally found after death, when no ſymptoms of inflammation had previouſly exiſted. (Morgagni Epiſt. xxv. art. 17. Bonet, tom. i. p. 849, &c.)

CARDITO, in *Geography*, a town of Naples, in the province of Calabria ultra, 8 miles E.S.E. of Reggio.

CARDIUM, in *Conchology*, a Linnæan genus of bivalves, the ſhell of which is nearly equilateral, equivalve, and in moſt ſpecies, convex, longitudinally ribbed, ſtriated, or grooved, with a dentated margin : hinge with two teeth near the beak, and a larger, remote, lateral tooth on each ſide in both valves, and which, when the ſhell is cloſed, lock into each other. Animal inhabitant of the ſhell a *tethys*, having two ſmall pores on the left ſide of the body.

Costatum. A large ſpecies deſcribed by Linnæus that inhabits the African Ocean : the ſhell is gibbous and equivalve with raiſed, carinated, concave, membranaceous ribs. Muſ. Lud. Ulr.—*Concha exotica*, Argenville, *Kaman* Adanſon.—Length three inches ; breadth three inches and a half ; general colour whitiſh, with ſometimes broad brown grooves or ſtripes. Called by Engliſh collectors the *Pipe-ridged cockle*.

Cardissa. Shell heart-ſhaped ; valves compreſſed and carinated with teeth ; beaks approximate. Linn.—*Cardiſſa* of Rumpfius, and *Cor veneris* of Argenville.

Smaller than the preceding, the length being only two inches and a half, and the breadth two inches. The ribs are placed obliquely, and there is a conſpicuous heartſhaped depreſſion before the beaks ; the general colour is whitiſh, ſometimes ſpotted with ſanguineous. Individuals of this ſpecies according to Gmelin are occaſionally found concave on one ſide. It inhabits the Indian Ocean.

Roseum. Shell heart-ſhaped ; anterior part furrowed with lines, poſterior ſtriæ rather broader, and forming by their conjunction a cordated figure ; one part convex, the other concave. Argenville, &c.—This inhabits the Nicobar iſlands, and reſembles the former ; ſhell whitiſh varied with roſe-colour.

Retusum. Shell heart-ſhaped ; valves ſtriated, crenulated, and ſlightly carinated, with lunate cordiform gape behind the beaks.—This ſhell, which is two inches long, and nearly the ſame in breadth, is of a milky-white colour, thick, with the anterior part concave, and poſterior convex ; margin with plaited teeth. Inhabits India, Arabia, and Egypt. Born, &c.

Hemicardium. Shell heart-ſhaped, ſomewhat quadrilateral ; valves carinated ; beaks diſtant. Linn.

This is deſcribed as an inhabitant of the Indian Ocean ; it reſembles Cardium Cardiſſa ; and is of an ochraceous colour, a few of the ribs are glabrous, the reſt nodulous with intermediate grooves wrinkled and marked with excavated dots ; ſhell within ſnowy-white.

Lineatum. Shell heart-ſhaped, carinated, anterior part obliquely truncated, thin, very ſmooth, ſnowy with golden coloured ſtriæ; margin denticulated. Kaemm. lab. Rudolſt.—Shell above an inch long; its native place unknown.

Medium. Shell ſomewhat heart-ſhaped, and ſlightly angulated; valves angulated, ſmooth, and ſulcated. Linn. &c.

Inhabits American Seas. This reſembles *Cardium Hemicardium*; the ſhell is whitiſh, and generally ſpotted with cheſnut or brown; ribs numerous; hinge with a ſingle primary tooth.

Aculeatum. Shell ſomewhat heart-ſhaped, with prominent ribs grooved down the middle and beſet with large hollow aculeations, and ſub-petalous ſpines towards the circumference. Inhabits the Mediterranean and European ſeas. This is a large ſpecies of a browniſh colour, or whitiſh variegated with brown bands. Found on the Britiſh coaſts. Donov. Brit. Shells, &c.

Echinatum. Shell ſomewhat heart-ſhaped, ſulcated, with ſpinous carinated ribs. Linn. &c.—Inhabits European ſeas.

Rather reſembles the laſt in figure, but is ſmaller, and paler in colour; whitiſh, variegated with brown. Found on the Britiſh coaſts. Donov. &c

Ciliare. Shell ſomewhat heart-ſhaped, with triangular elevated ribs beſet along the edges with thin ſpines, Gmel. &c. A native of the African and European coaſts; whitiſh with about eighteen ribs.

Ciliatum. Shell ſomewhat heart-ſhaped, with elevated ſub-triangular ciliated ribs. Inhabits the North Seas. O. Fabr. &c.

This reſembles *Cardium ciliare*, from which it differs, among other particulars, in having about twice the number of ribs: colour cinereous, or greyiſh-white.

Tuberculatum. Shell ſomewhat heart-ſhaped, with obtuſe, knotty, tranſverſely ſtriated grooves. Linn. Inhabits the Mediterranean ſea, and is variouſly coloured and marked; ſometimes white, or whitiſh with brown bands; ſometimes brown with darker bands; ribs from twenty to twenty-three in number, convex, with a few nodoſities.

Isocardia. Shell heart-ſhaped, with arched imbricated ſcales along the furrows. Linn.

An American ſpecies about two inches and a half in length, and two inches and a quarter broad; colour cinereous-white, with a few red ſpots or clouds; ſhell within white, and purple in the middle, and a ſingle primary tooth in each valve at the hinge.

Fragum. Shell ſomewhat heart-ſhaped, and ſlightly angulated with elevated lunules down the grooves. Linn. *Fragum album* of Rumpf.

Inhabits India. Colour white, with yellow, or ſulphur lunules; within ſnowy; ribs flattiſh. Perhaps a ſmall variety of the following ſpecies.

Unedo. Shell ſomewhat heart-ſhaped, with lunate coloured grooves. Linn.

This inhabits India, and reſembles *Cardium fragum*, but is twice as large, and has fewer red ſcales on the grooves; lips of the anterior edge incumbent.

Muricatum. Shell ſomewhat heart-ſhaped, furrowed, and muricated at the ſides. Linn.

A native of the American ſeas; colour cinereous, white or yellowiſh, mixed or ſpotted with bay; margin ſerrated; hinge with two red ſtripes within.

Magnum. Shell oblong, with angular grooves ſerrated at the ſide. Linn.

A ſuppoſed variety of this ſpecies is called the baſket cockle by Martyn. Univ. Conch. Cardium magnum inhabits India, and America: the ſhell is ſerrated on the margin with twenty or thirty grooves, and tranſverſely wrinkled. Colour variable, yellowiſh, ochraceous with duſky ſpots or tawny, and cinereous with blackiſh ſpots; within w:

Flavum. Shell ſomewhat ovate, ſulcated, anterior margin ſcabrous, poſterior one toothed. Linn

A native of India. Back and poſterior end generally yellow, and ſometimes ſpotted, the reſt white; ribs about twenty-ſeven in number, of a convex form, with the firſt five or ſix armed with ſharp ſpines; twelve or thirteen poſterior ones with flat tubercles, the intermediate ones ſmooth.

Lævigatum. Shell obovate, with obſolete longitudinal ſtriæ. Linn.

This kind inhabits the American, Atlantic, and European ſeas. Length about two inches and breadth nearly the ſame: colours various, generally brown or teſtaceous, with darker clouds and ſpots, and ſometimes bands.

Serratum. Shell obovate, ſmooth, with obſolete ſtriæ, ſerrated at the interior margin. Linn.

A native of the Mediterranean and Indian ſeas; ſhell ſmaller and leſs convex than *Cardium lævigatum*; of a yellow colour, with the beaks regular.

Edule. Shell antiquated, with about twenty-eight flattiſh ribs tranſverſely ſtriated with obſolete recurved imbrications.

This is our common cockle, a ſpecies found in the greateſt plenty buried in the ſands on all the arid ſhores of Europe. The animal inhabiting this ſhell has a peculiar flavour, and is eſteemed as a wholeſome and palatable food; the ſpecies varies in ſize and colour, they occur of a large ſize on ſome of the Scottiſh ſhores. Donov. Brit. Shells.

Islandicum. Shell ſulcated, with about thirty-ſix ſmooth triangular ribs. Chemn.

Inhabits the North Seas, eſpecially near the coaſts of Iceland and Greenland; in its general aſpect it reſembles our common cockle, cardium edule, but the grooves are deeper and more numerous, and there are no ſtriæ except the outer margin; colour blackiſh, ſometimes banded.

Groenlandicum. Shell glabrous, thin, mouſe colour, with angulated ferruginous lines; margin glabrous with obſolete longitudinal lines. Chemn.

Same habitat as the former, about two inches and three quarters long, and three inches and a half broad; ſometimes banded with brown.

Rusticum. Shell with twenty remote grooves, the intermediate ſpaces rugged. Inhabits European ſeas. Gmel. &c.

Obſ. The ſpecific name ruſticum has been aſſigned to more than one or two different ſpecies of this genus; the C. *ruſticum* of ſome Engliſh writers is probably only a variety of C. *edule*. Vide Donov. Brit. Shells. C. *ruſticum* of Chemn. may be diſtinct, but that is doubtful.

Glaucum. Shell ſubantiquated, anterior part glaucous: poſterior part with twenty grooves imbricated upwards; beaks violet. Poiret.—Inhabits the ſhores of Barbary. A ſmall ſpecies.

Pectinatum. Shell ſomewhat heart-ſhaped, and pectinated. Linn.—Found in the Mediterranean ſea. General colour white, with the cavity under the beaks yellow; valves marked with diſtant ſtriæ that are rough upwards; margins of the ſhells prominent.

Virgineum. Shell triangular, rounded, equilateral, with tranſverſe membranaceous recurved wrinkles; hinges blue. Gmel. &c. Inhabits the Mediterranean. A variety is found in the Indian and American ſeas.

Strilaterum. Shell triangular, gibbous, and ſtriated. Gmel. Inhabits the Caſpian Sea. An indiſtinct ſpecies.

Auricula. Shell heart-ſhaped, and ſlightly rhombiform with twenty-four ribs on each ſide; the grooves very finely crenulated; beaks diſtant.

Deſcribed by Forſkal as a native of the Arabian ſeas; ſhell white and pellucid, two inches and a quarter long, and one inch and three quarters broad; margin of the back revolute and toothed.

Triste. Shell ovate and ſmooth; margins both of the anterior and poſterior ſlope ſtriated. Linn.

Native place unknown. Shell ſmooth, cinereous, and radiated with white; beaks reflected.

Monstrosum. Shell gibbous, one ſide impreſſed and ochraceous, the other convex heart-ſhaped, and whitiſh ſpotted with yellow; valves with dentated ridges. Chemn. —This is a very rare ſpecies; inhabits the Nicobar iſlands.

Lima. Shell gibbous with aculeated ribs, the anterior ones with recurved membranaceous tubercles crenated at the ſides; the intermediate grooves granulated. Chemn. Inhabits the Nicobar iſlands. This ſhell is ochraceous, with the anterior margin fleſh-coloured, and the beaks reddiſh. A ſuppoſed variety of this ſpecies is deſcribed by Schroet, in which the ribs are more rounded, and inſtead of being aculeated or prickly are only granulated.

Ringens. Shell rotundate, ventricoſe, and white, with deep teeth at the margin, the anterior ones roſy. Liſter, &c. Inhabits the African and Mediterranean ſeas.

Aeolicum. Shell thick, with longitudinal anterior ſtriæ, and tranſverſe ſtriæ behind. Chemn. &c.—A native of Guinea, and the Antilles iſlands. Obſ. This ſhell is very convex, and is varied with white and reddiſh.

Oblongum. Shell yellowiſh, oblong, turgid, and coſtated; anterior part glabrous, and cordiform with a crenated margin. Chemn.—Inhabits the Mediterranean. Length three inches, breadth two inches and a half; ribs about thirty. Much allied to the following ſpecies.

Crassum. Shell ſomewhat fuſcous, rather oblong, thick, antiquated, with a very deeply dentated margin. Schroet, &c.—Reſembles *Cardium oblongum*, but is much larger, rather broader, thicker, and has about twenty-three flattiſh ribs. Alſo inhabits the Mediterranean, and is found in the North Seas.

Papyraceum. Shell pellucid, cinereous, with thin longitudinal ſtriæ. Chemn.—This kind inhabits India; the ſhell is very brittle, within white, with purpliſh ſpots.

Latum. Shell broad with unequal ſides; ribs rather flat and ſpinulous. Chemn. &c.

Length two inches, breadth half an inch more; colour variable, being in ſome individuals white on the crown, yellowiſh in the middle, and edged with yellow; in others the crown is brown, and the reſt of the ſhell banded with fuſcous; inſide white. Inhabits Tranquebar and Nicobar Iſlands.

Maculatum. Shell ſpotted, with crowded undulated wrinkles; ribs broad; grooves very narrow, within pale roſy. Liſt.—Found in the bay of Campechy. This ſhell is nearly three inches long, its breadth rather more, being three inches and three quarters.

Flexuosum. Shell rotundate, fuſcous with flexuous ribs, and rugoſe furrows.

Deſcribed by Liſter; length one inch and three quarters, and about the ſame in breadth. Native place unknown.

Gaditanum. Shell rounded, yellowiſh-white, varied with red, green, and brown, and marked with decuſſated ſtriæ. Bonan. &c. Found near Cadiz. Gmelin conceives this may be an *arca*.

Brasiliense. Shell rounded; ribs broad, flat, and very minutely crenated. Frequent on the Braſilian ſhores. Bonan. &c.

Amboinense. Shell rather oblong, white with blackiſh ſpots: the ribs very convex.—Inhabits the Amboina ſhores. Bonan. &c.—Obſ. This ſhell is about an inch and three quarters in length, with about twelve ribs.

Squamosum. Shell heart-ſhaped, equilateral, tawny white, and purpliſh within; ribs with imbricated ſcales. Gualt.—Reſembles *Cardium fragum*, but wants the teeth at the anterior margin. Native place unknown.

Rubiginosum. Shell reddiſh, with unequal ſides, and convex ribs tranſverſely ſtriated. Gualt. Native place unknown.

Virescens. Shell inequilateral, oblong, with very fine ribs doubled above. Gualt. Native place unknown.

Fasciatum. Shell rounded, whitiſh, with a brown band; ribs acute. Knorr. Native place unknown.

Cancellatum. Shell reddiſh, thin, rounded, with decuſſating ſtriæ. Gualt. Small. Native place unknown.

Albidum. Shell inequilateral, ribbed, whitiſh, and purple within.

Obſ. There are a few other of the larger ſpecies of Cardium deſcribed by conchological writers which we conſider as ambiguous. Theſe, with ſeveral of the more minute, and microſcopic kinds, are purpoſely omitted in the above enumeration of ſpecies, as we are inclined to believe the inſertion of ſuch would rather tend to perplex than inform the general reader.

CARDONA, in *Geography*, a town of Spain, in Catalonia, ſeated on an eminence near the river Cardonero, with a ſtrong caſtle, and the title of a duchy. In its vicinity are an inexhauſtible mountain of ſalt of various colours, which, when waſhed, becomes white; and alſo vineyards, which produce excellent wine, and lofty pine-trees. N. lat. 41° 42′. E. long. 1° 26′.

CARDONERO, a river of Spain, which runs into the Llobregat, at Manxes, in the province of Catalonia.

CARDOON, in *Botany*. See Cynara *Cardunculus*.

CARDS, *playing*, are little pieces of fine thin paſte-board, of an oblong figure and of ſeveral ſizes, but with us commonly $3\frac{1}{2}$ inches long, and $2\frac{1}{2}$ broad; on which are printed divers points and figures; a certain number or aſſemblage of which ſerve for the performance of various games: as baſſet, ombre, picquet, whiſt, &c. A full pack conſiſts of fifty-two cards.

A pack is always wrapped up in a piece of paper, on which are printed the name, ſign, dwelling-place, &c. of the maker; with the label of the ſtamp-office of England, ſignifying that the ſtamp-duty has been paid.

Among ſharpers, divers ſorts of falſe or fraudulent cards have been contrived; as marked cards, breef cards, corner-bend, middle-bend, &c.

*Marked cards*, are thoſe where the aces, kings, queens, and knaves, are marked on the corners of the backs with ſpots of different number and order, either with clear water, or water tinged with pale Indian Ink, that thoſe in the ſecret may diſtinguiſh them. Aces are marked with ſingle ſpots on two corners oppoſite diagonally; kings with two ſpots at the ſame corners; knaves with the ſame number tranſverſed, &c.

*Breef cards*, are thoſe which are either longer or broader than the reſt; chiefly uſed at whiſt and picquet.

The broad cards are uſually for kings, queens, knaves, and aces; the long for the reſt. Their deſign is to direct the cutting, to enable him in the ſecret to cut the cards diſadvantageouſly to his adverſary, and draw the perſon unacquainted with the fraud, to cut them favourably for the ſharper. As the pack is placed either endways or ſideways to him that is to cut, the long or broad cards naturally lead him to cut to them. Breef cards are ſometimes made thus by the manufacturer; but in defect of theſe, ſharpers pare all but the breefs with a razor or pen-knife.

*Corner bend*, denotes four cards turned down finely at one corner, to ſerve as a ſignal to cut by.

*Middle-bend*, or *Kingſton-bridge*, is where the tricks are bent two different ways, which cauſes an opening or arch in the middle, to direct likewiſe the cutting.

The inventor of cards is not known, nor even the age when they firſt appeared; but by the matter they were always made of, viz. leaves of paper, they ſhould ſeem to be much poſterior to the time of Charlemagne. The hon. Daines Barrington, Mr. Bowle, and Mr. Gough, in their three eſſays on the "Antiquity of Card-playing," (Archæologia, vol. viii.) ſeem to agree that the Spaniards have the beſt pretenſions to be conſidered as the original inventors of this amuſement. Others have traced their invention to about the year 1390, for the purpoſe of diverting Charles VI. then king of France, who was fallen into a melancholy diſpoſition, and aſcribe it to Jaquemin Gringonneur, a painter in Paris. Accordingly in the accounts of the treaſurer of that prince the following article occurs; "Paid fifty ſix ſhillings of Paris to Jaquemin Gringonneur the painter, for three packs of cards, gilded with gold, and painted with diverſe colours and diverſe devices, to be carried to the king for his amuſement." From this article it appears, that playing cards were originally very different in their appearance and their price from what they are at preſent. They were gilded, and the figures were painted or illuminated, which required no little ſkill and genius, as well as labour: and the price of each pack was no leſs than 18s. 8d. of Paris, a very conſiderable ſum in thoſe times. This laſt circumſtance is one reaſon that playing cards were little known and uſed for ſeveral years after they were invented. By the four ſuits or colours, the inventor might deſign to repreſent the four ſtates or claſſes of men in the kingdom. The *cœurs* or hearts denote the *gens de chœur*, choir-men or eccleſiaſtics. The nobility or prime military part of the kingdom, is repreſented by the ends or points of lances or pikes, which through ignorance of the meaning of the figure, we have called ſpades. By diamonds are deſigned the order of citizens, merchants, and tradeſmen. The trefoil leaf, or clover graſs, corruptly called clubs, alludes to the huſbandmen and peaſants. The four kings are David, Alexander, Cæſar, and Charles; repreſenting the four celebrated monarchies of the Jews, Greeks, Romans, and Franks under Charlemagne. The queens repreſent Argine (for Regina, queen by deſcent), Eſther, Judith, and Pallas; which are typical of birth, piety, fortitude, and wiſdom. The knaves denote the ſervants to the knights: others apprehend that the knights themſelves were denoted by theſe cards, becauſe Hogier and Lahire, two names of the French cards, were famous knights at the time when they were ſuppoſed to be invented.

The firſt certain notice of their having been known in England occurs in a record in the time of Edward IV. On an application of the card-makers of London to parliament, A.D. 1463, an act was made againſt the importation of playing-cards, 3 Edw. IV. c. 4. From this ſtatute it appears, that both card-playing and card-making were known and practiſed in England before this period, or about 50 years after the æra of their ſuppoſed invention. Mr. Gough obſerves *(ubi ſupra)*, that the uſe of cards among the Chineſe is evident, not only from a Chineſe painting which repreſents their ladies playing at a game with ſomething much thicker in ſubſtance than cards, yet ſhaped and numbered like them, but alſo from a pack of Chineſe cards in his poſſeſſion, made of the ſame materials as the European However, the devices on theſe cards are very different from thoſe known in this part of the world. Although card-playing was introduced at comparatively a late period in England, and the progreſs of it was at firſt ſlow, it hath ſince become ſufficiently rapid and extenſive, to the coſt of many unfortunate gameſters, and the loſs of many others, who ſpend too much of their time in that infatuating amuſement. Lord Lyttelton in his Perſian letters (apud Miſcellaneous works, vol. i. p. 143), admirably rallies thoſe who indulge their propenſity for this kind of diverſion to exceſs, and who riſk ſums of money which it is not convenient for them to loſe; or, in other words, who pervert it to the purpoſe of gaming. Selim repreſents himſelf as viſiting at a houſe in London, where he ſaw a number of tables in a room, round which were placed ſeveral ſets of men and women. They ſeemed (ſays he) wonderfully intent upon ſome *bits of painted paper*, which they held in their hands: I imagined at firſt that they were performing ſome magical ceremony, and that the figures I ſaw traced on the bits of paper were a myſtical taliſman or charm. What more confirmed me in this belief was the grimaces and diſtortions of their countenances, much like thoſe of our magicians in the act of conjuring; but inquiring of the gentleman who introduced me, I was told they were at *play*, and that *this* was the favourite diverſion of both ſexes. But, as he proceeds, I ſee no ſigns of mirth among them: if they are merry, why do not they laugh, or ſing, or jump about? If I may judge of their hearts by their looks, half of theſe *revellers* are ready to hang themſelves! that may be, ſaid my friend; for very likely they are loſing more than they are worth. How! ſaid I, do you call that *play?* Yes, replied he, they never are thoroughly pleaſed unleſs their whole fortunes are at ſtake. Thoſe *cards* you ſee them hold, are to decide whether he who is now a *man* of *quality* ſhall be a *beggar;* or another, who is now a *beggar*, and has but juſt enough to furniſh out one night's play, ſhall be a *man of quality*, &c. &c.

The method of making playing cards ſeems to have given the firſt hint to the invention of printing; as appears from the firſt ſpecimens of printing at Haerlem, and thoſe in the Bodleian library.

Cards, *making of.* The cutting of the moulds, or blocks, for theſe cards, is preciſely the ſame as that uſed for the firſt books; and a ſheet of wet or moiſt paper is laid on the form or block, which is firſt lightly bruſhed over with an ink, made of lamp-black mixed with ſtarch and water; and then rubbed off with a round liſt, in the hand. The court-cards, they colour by help of ſeveral patterns, called "ſtaneſiles;" conſiſting of papers cut through with a penknife: within the apertures, or inciſions of which, the ſeveral colours, as red, &c. are ſeverally applied (for at the firſt printing, the card has only a mere outline.) Theſe patterns are painted with oil colours, to keep them from wearing out by the bruſhes: being laid on the paſte-board, they ſlide a bruſh full of colour looſe over the pattern; which leaving the colour within the apertures, forms the face or figure of the card.

This, very probably, was the way of the firſt printing at Haerlem; as might have been diſcovered long ago, if it had been conſidered, that the great letters in our old manuſcripts of nine hundred years ago, are apparently done by the illuminers, after the method of card-making.

By 43 G. III. c. 60, a duty is impoſed of 2l. 8s. on every dozen packs of playing cards imported: and for every pack of cards, made in Great Britain, the ſtamp duties by ſeveral acts amount to 2s. 6d., and for every pair of dice, 17s. 6d.

Places of making them are to be entered under a penalty of 50l., and forfeiture of the cards, dice, materials, and utenſils. Makers of cards ſhall ſend to the commiſſioners of the ſtamp-office a ſufficient quantity of paper in order to have as many aces of ſpades impreſſed upon them as he ſhall deſire; and a device, denoting the ſaid ace of ſpades, ſhall be ſtamped on every pack uſed in Great Britain or intended for exportation, which device ſhall diſtinguiſh cards deſigned for home conſumption from thoſe intended for foreign conſumption:—and wrappers incloſing cards for uſe in Great Britain ſhall have the name of the maker or any other particular word printed on them, according to the direction of the commiſſioners, who ſhall denote one of the 6d. duties charged on cards in Great Britain on each of ſuch wrappers. Officers ſhall enter houſes or places where cards and dice are made or ſold, or ſuſpected to be made, or any public gaming-houſe, to ſearch and examine whether ſuch cards are ſtamped; and the owner or occupier refuſing ſuch entrance or ſearch ſhall forfeit 10l. No materials for cards or dice ſhall be removed till they are finiſhed, on pain of double duty; nor ſhall any cards or dice be removed, till they are duly marked or ſealed, on pain of forfeiting the ſame and treble value. Entry ſhall be made once in 28 days on oath, under a penalty of 20l., and the duties ſhall be cleared off once in every ſix weeks, on pain of double duty. Selling or uſing unſtamped cards or dice, incurs a forfeiture for every pack and for every one of ſuch dice of 10l. with full coſts. Altering the ſtamps ſubjects to a forfeiture of 20l. and the ſale or purchaſe of ſuch ſtamp incurs the ſame forfeiture. A perſon who takes off the ſtamp of any playing cards, or outſide paper of any parcel or pack of cards, for the purpoſe of uſing it again, ſhall be guilty of felony, and tranſported for any time not exceeding ſeven years. The ſelling of waſte cards, not previouſly rendered unfit for uſe in playing, incurs a forfeiture of 20l.; and any perſon who ſells any cards, as ſecond-hand cards, in packs or parcels, the wrapper of which has been broke open, unleſs every card be rendered unfit for play, forfeits 5l. for every ſuch pack. If any perſon counterfeit the ſtamp on cards or dice, or the wrapper, or knowingly ſells the ſame with a counterfeit ſtamp, or fraudulently uſes any of the ſtamps provided by the commiſſioners, he ſhall be guilty of felony without benefit of clergy. No cards or dice ſhall be exported or expoſed to ſale without being ſtamped, until after the expiration of ten days after notice to the ſtamp-office by the maker of the quantity to be exported, and of the place to which they are intended to be conveyed, nor until a proper certificate be delivered to the cuſtom-houſe officer at ſuch poſt or place in Great Britain. Cards or dice may be removed by the maker without payment of the duties, provided the ſame be ſtamped for exportation, and a bond be given for exporting them within the time, and landing them at the port therein mentioned. Cards for exportation ſhall before packing be marked as the commiſſioners direct; and perſons uſing or ſelling ſuch cards, marked for exportation, in Great Britain, ſhall forfeit 20l. for every ſuch pack: and any perſon relanding any parcel of cards, entered and ſhipped for exportation, ſhall forfeit 50l.; and if any perſon concerned ſhall inform againſt an accomplice, he ſhall be admitted as evidence, and be indemnified.

CARDS, in *Manufacture*. See CARD.

CARDUCHI, in *Ancient Geography*, a ſtout warlike people of Aſia, who were deſcended from the ancient Scythians, and divided into a great number of tribes. According to Strabo they were at a period ſubſequent to that of the famous retreat of Xenophon better known by the name of Parthians; a nation which became ſuch a terror to the Romans. M. De Liſle, in the explication of his map of Xenophon's retreat, alleges ſeveral arguments to prove, that they were the ſame with the preſent Curds, and that their country was the ſame which the Romans called Carduena, a large and mountainous territory on the eaſt of the Tigris, and the moderns Curdiſtan; though it is probable, that the preſent tract which goes by that name is of much greater extent than that which the Carduchi then poſſeſſed, who only occupied the mountainous parts of it. Before the period of the retreat of the Greeks, they had defeated a Perſian army of 120,000 men, none of which ever returned, the roads being impaſſable. Upon the approach of Xenophon's army they betook themſelves to flight with their wives and children, and gave the Greeks a favourable opportunity for ſupplying themſelves with plenty of proviſions. Xenophon was much haraſſed by looſe bands of theſe people, who diſcharged upon him and his rear-guard which he conducted, vollies of darts and ſtones. The Carduchi were much ſuperior to the Greeks in the uſe and ſtrength of their bows. We are told (Diod. Sic. lib. xiv. Xenophon, Anabaſ. lib. iv.) that they were of ſuch prodigious length, that they bent them with their feet; the arrows were in proportion, ſo well tempered and keen, and darted with ſuch violence, that no ſhield could reſiſt them; ſo that, by being able to throw them at ſuch a diſtance, they kept themſelves out of the reach of their enemies.

CARDUEL, or CARTHUEL, in *Geography*, a name given to the eaſtern part of Perſian Georgia; the capital of which is Teflis.

CARDUELIS, in *Ornithology*, the name under which the common gold-finch is deſcribed by Geſner, Aldrovandus and others. See FRINGILLA *Carduelis*, Linn. CARDUELIS *Americana* of Briſſ. is the American gold-finch of Engliſh writers; FRINGILLA *triſtis*, Gmel.

CARDUENA, in *Ancient Geography*. See CARDUCHI.

CARDUNCELLUS, in *Botany*, Lob. ic. 2. p. 20. See CARTHAMUS *Carduncellus*.

CARDUNCULUS. See CYNARA.

CARDUUS, (a name given by the ancient Latin writers to ſeveral kinds of prickly plants, and particularly to the teaſel, (dipſacus fullonum) formerly uſed in *carding* wool, as it ſtill is in dreſſing cloth. The word is ſaid to be derived from caro, (Gr. *κειρω*,) a technical verb denoting the operation of cleanſing wool from its impurities.) Thiſtle, Linn. gen. 925. Schreb. 1254. Willd. 1433. Juſſ. 173. Vent. vol. ii. p. 499. Gært. 932. Chardon, La Marck Encyc. Claſs and order, *ſyngeneſia polygamia æqualis*. Nat. ord. *capitatæ*, Linn. *Cinarocephalæ*, Juſſ.

Gen. Ch. *Cal. common*, ſwelling out in the middle, imbricated; ſcales numerous, lanceolate; terminated by a ſimple ſpine; in ſome ſpecies ſtrong, in others weak. *Cor.* Florets all furniſhed with ſtamens and a piſtil, uniform, tubular, funnel-ſhaped, nearly equal, reflected; tube very ſlender; border erect, five-cleft; ſegments linear, equal, one more deeply ſerrated than the reſt. *Stam.* Filaments five, capillary, ſhort; anthers united, forming a hollow five-toothed cylinder. *Piſt.* Germ egg-ſhaped; ſtyle thread-ſhaped, longer than the ſtamens; ſtigma ſimple, awl-ſhaped, naked, emarginate. *Peric.* none; except the permanent, ſomewhat converging, common calyx. *Seeds* ſolitary, inverſely egg-ſhaped, a little four-cornered; down ſeſſile, long, deciduous. *Recep.* hairy.

Eſſ. Ch. *Cal.* ſwelling out in the middle, imbricated; ſcales terminating in a ſimple ſpine. *Receptacle* hairy. *Down* deciduous.

This genus, like moſt of the others in the claſs ſyngeneſia, is differently characterized by different authors. Some have divided the Linnæan genus into two: *carduus* including only thoſe ſpecies which have a capillary down, and *cirſium* containing thoſe whoſe down is feathery. Willdenow has united the latter with *cnicus*, and makes the eſſential difference between *carduus* and *cnicus* to depend entirely on the nature of the down. La Marck, on the other hand, has aboliſhed the *cnicus* of Linnæus, which, he ſays, has a character too vague to be admitted; and has diſtributed its ſpecies between carduus and carthamus, obſerving, that ſome ſpecies of carduus in the Species plantarum, approach rather too near the character of carthamus. After a careful conſideration of the ſubject, we are inclined to adopt his arrangement; and have conſtructed accordingly the generic and eſſential characters of carduus given above, adding from Gærtner, "down deciduous," which has the ſanction of Dr. Smith; though we are not without apprehenſion, that this character may not be found in all the preſent acknowledged ſpecies.

Species. * *Leaves decurrent.*

1. C. *leucographus*, Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Willd. 1. Gært. tab. 162. fig. 1. Moriſ. Bleſſ. 244. (Cirſium maculis argenteis notatum, Tourn. Inſt. 448.) "Leaves toothed-ſpinous; peduncles naked, very long, one-flowered; calyxes ſpinous, inclined." *Root* annual. Allion. Biennial. La Marck. *Stam* two or three feet high. *Root-leaves* ſcarcely petioled, growing cloſe to the ground. *Stem-leaves* ſmooth, bright green, ſpotted with white, half-embracing the ſtem, and running down it ſo as to form three uninterrupted membranous wings, oblong-egg-ſhaped, pinnatifid nearly to the middle; lobes furniſhed with ſpines. *Flowers* purple, ſmall; peduncles woolly and white, eſpecially towards the ſummit, generally naked, but ſometimes with a ſmall leaf or two; ſpines of the calyx ſtraight, not pungent. *Down* ſimple. A native of Italy and the ſouth of France. 2. C. *peregrinus*, Willd. 2. Retz. Obſ. 1. p. 27. (C. lacteus peregrinus camerarii, Rai. hiſt. 312.) "Leaves ſcolloped, ſpinous, downy underneath; peduncles generally naked, many-flowered; calyxes ſpinous, deciduous." Retz. *Root* annual. *Stem* three feet high, branched, ſtriated, ſmooth; terminal branches downy. *Leaves* ſeſſile, ſpotted with white above. *Flowers* red; florets few, ſcarcely longer than the ſcales of the common calyx; peduncles terminal and axillary; terminal ones branched, winged, long, from three to ſix-flowered; axillary ones ſhort; ſcales of the calyx a little downy, deciduous, furniſhed with ſoft ſpines. *Seeds* ſmall, white, beſmeared with a whitiſh pellucid gum, which faſtens the down ſo ſtrongly to them, that it cannot eaſily be ſeparated; down capillary. A native of Spain. Ray. 3. C. *lanceolatus*, Linn. Sp. Pl. 2. Mart. 2. Lam. 2. Eng. bot. 1 .7. (Cnicus lanceolatus, Willd. 10.) Spear thiſtle. "Leaves pinnatifid, hiſpid; ſegments divaricated; calyx villous; ſtem hairy." *Root* biennial, branched. *Stem* three or four feet high, erect, ſtrong, branched, furrowed, many-flowered. *Leaves* alternate, woolly underneath; lobes pinnatifid, or palmate at the baſe; ſegments alternately divaricated, mucronate-ſpinous; ſpines yellow, ſhining. *Flowers* terminal, erect, large; calyx egg-ſhaped; ſcales acutely ſpinous, aſcending, clothed, like the under ſurface of the leaves, with a white, cotton-like web; florets uniform, purple; anthers yellow. *Seeds* inverſely egg-ſhaped, ſhining; down feathery. Dr. Smith. A native of waſte places and road ſides throughout Europe, flowering from June till winter. 4. C. *nutans*, muſk thiſtle. Linn. Sp. Pl. 3. Mart. 4. Lam. 3. Willd. 6. Eng. bot. 107. "Leaves interruptedly decurrent, ſpinous; flowers drooping; ſcales of the calyx lanceolate; their upper part ſpreading." *Root* annual, (biennial, Lam.) ſpindle-ſhaped. *Stem* two or three feet high, erect, a little branched, ſtriated, ſmoothiſh. *Leaves* deeply ſcolloped and waved, very ſpinous, green on both ſides, a little hairy, but not rough. *Flowers* terminal, ſolitary, peduncled, of a rich crimſon colour, ſmelling ſtrongly of muſk in warm weather; peduncles woolly; calyx egg-ſhaped; ſcales lanceolate, acutely ſpinous, ſomewhat woolly; the outer ones ſpreading, the inner ones more cloſe. *Seeds* ſhining, compreſſed, marked with dotted ſtreaks; down rough, but not feathery. Dr. Smith. A native of a calcareous ſoil in many parts of Europe, flowering in June. The dried leaves of this and the preceding ſpecies are ſometimes uſed to curdle milk. 5. C. *macrocephalus*, Willd. 5. Deſf. atl. 2. p. 245. "Stem downy; leaves interruptedly decurrent; flowers drooping; calyx-ſcales egg-lanceolate, woolly, their upper part ſpreading." Allied to the preceding, but differs in having a downy ſtem, and flowers two or three times larger. A native of Tunis, flowering early in the ſpring. 6. C. *lanuginoſus*, Willd. 4. (C. orientalis acanthi folio candidiſſimo, Tourn. Cor. p. 31.) "Leaves decurrent, lanceolate, pinnatifid, toothed, ſpinous, ſnowy white with down on both ſides; flowers terminal, ſolitary, ſeſſile." Whole plant covered with a denſe, white down. *Stem* toothed, with ſpines on the decurrent leaves. *Leaves* with three or four ſpinous teeth on the upper ſegments. *Flowers* purple, a little leſs than thoſe of C. nutans, erect; calyx-ſcales lanceolate, not ſpreading. A native of Armenia. 7. C. *criſpus*, curled thiſtle. Linn. S. Pl. 5. Mart. 6. Lam. 5? Willd. 13. "Leaves decurrent, ſpinous at the margin; flowers aggregate, terminal, with ſoft ſpines. Linn. Calyx-ſcales linear-awl-ſhaped, mucronate, ſpreading." Willd. *Leaves* downy, white, with green veins. *Peduncles* downy; ſcales of the calyx recurved, but not pungent. Linn. There is much confuſion in authors with reſpect to the plant intended by Linnæus. La Marck ſays that the flowers of his criſpus are not aggregate. 8. C. *polyanthemus*, Linn. Mant. 109. Mart. 7. Willd. 15. (C. pycnocephalus paluſtris, Trium. obſ. tab. 103. Cirſium paluſtre polianthemum, Vail. act. 160.) "Leaves ſcolloped, ciliated, naked underneath; flowers peduncled, cluſtered." Very like C. criſpus, but differs from it in having neither the petioles nor the under ſurface of the leaves downy. *Stem* taller than that of C. criſpus. *Leaves* deeply runcinate, not rigid, rather obtuſe, ciliated with ſoft ſpines, marked with hollow veins, paler beneath, but not white; upper ſtem-leaves lanceolate, irregularly ſcolloped, entirely decurrent, curled, ſcarcely pungent. *Flowers* purple, nearly ſeſſile, three or four together at the top of the ſtem; peduncles curved, not hairy; anthers violet; ſtyles white; ſtigmas purple. *Down* capillary. A native of Rome. Linn. 9. C. *acanthoides*, welted thiſtle. Linn. Sp. Pl. 4. Mart. 5. Willd. 9. Eng. bot. 973. (C. criſpus, Hudſ. Lightf. C. polyacanthos, Curt. Lond. Sibth. C. inclinans, With. 2d. ed. Mart. 39.) "Leaves decurrent, ſcolloped, ſpinous; calyxes globular, generally peduncled; ſcales recurved. *Root* annual, ſpindle-ſhaped, white. Whole plant green. *Stem* three feet high or more, erect, branched, furrowed, but little hairy; branches elongated, ſpreading. *Leaves* rather interruptedly decurrent, ſmaller than in C. nutans, green on both ſides, ſmoothiſh. *Flowers* terminal, a little inclining, deep purple, odorous; calyx globular; ſcales linear, recurved at the tip, ſlightly ſpinous, a little woolly; florets deeply divided nearly to the baſe ſo as to appear two-lipped; the upper lip four-cleft, the lower ſimple. *Down* deciduous; capillary, rough. Linn. and Dr. Smith. We have obſerved, beneath the diviſions of the ſegments,

five depreſſions reſembling nectareous glands. A native of ditch banks and hedges, flowering in June and July. 10. C. *nigreſcens*, Lam. 16. "Leaves decurrent, narrow, ſcollop-toothed, ſpinous, curled; flower large, terminal." *Stem* ſimple, ſcarcely a foot high, a little downy, ſometimes two-flowered. *Leaves* dark green, beſet here and there with a woolly down. *Flower* purple; calyx-ſcales briſtle-ſhaped, rather looſe, not pungent. Lam. Deſcribed from a dried ſpecimen. Obſerved by Villars on the Alps about Grenoble. 10. C. *hamuloſus*, Willd. 10. Ehr. Beitr. p. 166. "Leaves decurrent, lanceolate, pinnatifid-toothed, ſpinous, villous underneath; peduncles one-flowered, downy; calyx-ſcales awl-ſhaped, ſpinous; inner one recurved." *Root* biennial. *Stem* four or five feet high, much branched, erect. *Flowers* purple, drooping; calyx roundiſh. A native of Hungary. 12. C. *candicans*, Willd. 2. Waldſt. and Kitaib. Pl. Rar. Hung. i. p. 85. tab. 83. "Leaves ſemi-decurrent, lanceolate, pinnatifid, ſpinous, downy beneath; peduncles ſcaly, downy; calyx egg-ſhaped; ſcales awl-ſhaped, ſtraight." *Root* biennial. *Stem* ſmooth below. *Flowers* purple, leſs than thoſe of C. *criſpus;* calyx ſmooth. A native of Hungary. 13. C. *paniculatus*, Willd. 16. Mart. 46. Vahl. Symb. i. p. 68. Ait. Kew. iii. p. 143?" "Leaves ſemi-decurrent, tooth-ſcolloped, ſpinous, ſmooth; flowers panicled." *Root* perennial. *Stem* two feet high, erect, purpliſh, furrowed, angular, ſmooth, ſpinous. *Leaves* lanceolate; ſpines rigid, yellowiſh. *Flowers, towards the ſummit*, numerous, on woolly peduncles; *below* ſolitary, or growing two or three together, nearly ſeſſile; calyx egg-ſhaped; ſcales ſmooth, terminated by a ſmall yellowiſh ſpine. *Down* capillary. Vahl's plant is a native of the Pyrenées. The Kew plant was brought from the ſouth of Europe, and introduced in 1781, by Monſ. Thouin. The ſtem-leaves are ſaid to be unequally ciliated; the lower ones lyre-ſhaped and waved, but there appears little doubt of its identity with that of Vahl. 14. C. *paluſtris*, Linn. Sp. Pl. 6. Mart. 8. Lam. 6. Curt. Lond. Faſ. 6. tab. 56. Eng. Bot. 974. (Cnicus paluſtris, Willd. 1.) "Leaves decurrent, pinnatifid-toothed, ſpinous, rough; calyx egg-ſhaped, aggregate, with very ſmall ſpines." *Root* biennial, branched. *Stem* from three to ſix feet high, erect, ſtiff, angular, often branched; branches ſpreading. *Leaves* interruptedly decurrent, deep green. *Flowers* purple or white, terminal, often ſeſſile; calyx-ſcales lanceolate, keeled, preſſed cloſe, ſcarcely woolly. *Seeds* very ſmooth, not ſtriated; down deciduous, feathery. Dr. Smith. A native of wet ſituations in England, and many other parts of Europe, flowering in July and Auguſt. 15. C. *pungens*, (Cnicus, Willd. 2. Cirſium orientale, acanthi folio, Tourn. Cor. 32.) "Leaves decurrent, woolly underneath, pinnatifid, ſpinous; flowers in cloſe racemes; calyx-ſcales egg-ſhaped, ſpinous; ſpines ſpreading." *Stem* erect, branched, furrowed; ſpines ſtrong, yellowiſh, half an inch long. *Flowers* the ſize of thoſe of C. *paluſtris;* calyx-ſcales preſſed cloſe, terminated by a rigid, ſpreading, yellowiſh ſpine; down feathery. Similar in the infloreſcence and general habit to C. *paluſtris*, and in the ſhape of the leaves to C. *lanceolatus*. A native of Armenia. 16. C. *arenarius*, Deſf. Atl. ii. p. 247. tab. 222. (Cnicus, Willd. 3.) "Leaves decurrent, woolly, lanceolate, toothed, curled, ſpinous at the edge; flowers in cloſe racemes; calyx-ſcales lanceolate awl-ſhaped, pungent, reflexed." *Stem* a foot and a half, or two feet high; erect, ſimple, downy. *Leaves* unequally pinnatifid-toothed, with a white, woolly rib. *Flowers* pale violet, five or ſix at the top of the ſtem, nearly ſeſſile; calyx egg-ſhaped, the ſize of that of C. *lanceolatus;* ſcales cloſely imbricated at the baſe, woolly. *Seeds* four-cornered, ſmooth; down ſeſſile, white, feathered. Deſf. l. c. A native of Barbary near Sfax. 17. C. *pycnocephalus*, Linn. Sp. Pl. 7. Mart. 9. Lam. 7. Willd. 17. Jacq. Hort. tab. 47. "Leaves decurrent, pinnatifid-ſcolloped, pubeſcent, ſpinous; peduncles without leaves, downy; calyxes deciduous." *Root* perennial. *Stem* from one to three feet high, white, with hairs. *Root-leaves* ſomewhat lanceolate, a little ſcolloped; *ſtem-leaves* oblong, toothed, pubeſcent on both ſides, whiter, and almoſt woolly underneath. *Flowers* purple; peduncles ſhort, white with down, neither winged nor ſpinous; pedicels with three or four flowers; calyxes about the ſize of a hazel nut, oblong; ſcales awl-ſhaped, erect, ſpreading, with ſmall ſpines; florets often nine or ten; border erect. Linn. 18. C. *auſtralis*, Linn. jun. Supp. 348. "Leaves decurrent, runcinate, ſpinous; calyxes nearly ſeſſile, terminal." C. *Arabicus*, Willd. 3. Jacq. Ic. 1. tab. 166. Collect. i. p. 56? "Leaves decurrent, oblong, ſcolloped, ſpinous, white-veined, villous underneath; flowers ſeſſile, rather cluſtered; calyxes cylindrical." Willd. C. *galactites*, Lam. 21? "Stem winged, branched; upper wings broader; leaves decurrent, angularly toothed, ſpinous, downy underneath; flowers ſeſſile, axillary and terminal." La Marck. We have tranſcribed the ſpecific character given by each of the three authors, becauſe the identity of the plants has not been abſolutely aſcertained, though it ſeems highly probable. Profeſſor Martyn, however, conſiders the arabicus and the auſtralis as diſtinct ſpecies, n. 3, and 11. *Stem* about a foot high, woolly or cottony. *Leaves* alternate, remote, ſeſſile, ſcarcely decurrent all the way from one to another, oblong, ſomewhat ſcolloped at the ſides, a little cobwebbed, the lateral veins running out into white ſpines. Linn. jun. Oblong, ſcolloped in a pinnatifid manner, toothed, ſpinous, attenuated at the baſe, ſmoothiſh, and white-veined above, woolly-villous underneath; the root and lower ſtem ones petioled, the reſt decurrent. Willd. Decurrent, almoſt petioled, angular, toothed, ſpinous, green above, whitiſh and cottony underneath. Lam. The white veins are not mentioned by La Marck; but his ſpecific name implies them. *Flowers* terminal and lateral, terminal ones ſeveral, lateral ones ſolitary, ſeſſile. Linn. Willd. Lam. Calyx-ſcales lanceolate-egg-ſhaped, preſſed cloſe. Willd. Somewhat ſpreading. Linn. A native of the ſouth of Europe. Linn. Lam. Arabia? Willd. 19. C. *tenuiflorus*, Willd. 14. Mart. 51. Curt. Flor. Lond. Faſc. 6. tab. 55. Eng. Bot. 412. (C. acanthoides, Lam. 4. Hudſ. 351. Lightf. 451. With. Ed. ii. 871.) "Leaves decurrent, ſcolloped, ſpinous, downy; calyxes ſomewhat cylindrical, aggregate, ſeſſile; ſcales lanceolate, rather erect." *Root* annual, ſpindle-ſhaped, ſmall. Whole plant white, with down. *Stem* four feet high, erect, ſtiff, but little branched, furrowed. *Leaves* ſcolloped, moſt woolly underneath, broadly decurrent. *Flowers* pale purple, terminal, cluſtered, ſeſſile; calyx ſlender, pale, ſcarcely woolly; ſcales lanceolate, even, ſmooth, rather erect, but little nerved, acutely ſpinous; florets from ten to fifteen; down deciduous, capillary, rough. There was long much controverſy among Britiſh botaniſts concerning this thiſtle; the herbarium of Linnæus at length determined that it has not been inſerted among his works. Dr. Smith was for ſome time inclined to conſider C. pycnocephalus, auſtralis, and the plant before us, as only varieties of the ſame ſpecies. He obſerves, however, that the two former have fewer ſcales in their calyx, the ſtalk leſs winged, and their flowers, whether ſeſſile or pedunculated, are much fewer together, with leſs numerous florets. See Eng. Bot. La Marck's acanthoides is clearly the preſent plant, and he ſpeaks of it as very common in uncultivated ground, dry ditches, and under the ſhelter of walls in France and other parts of

Europe. In Great Britain it appears to be very local, though abundant where it has once gained a footing. It is common about London, growing, as Curtis obſerves, in the very ſuburbs. We have obſerved it about the ſkirts of Edinburgh and Sunderland, and ſhould have ſuppoſed it confined to the neighbourhood of populous towns, if we had not found it in great plenty at Blackpool in Lancaſhire, about the dry banks, which are the only fences of the incloſed land in that naked part of the country. 20. C. *argentatus*, Linn. Mant. 280. Mart. 10. Lam. 8. Willd. 18. Jacq. hort. tab. 192. (Cirſium ægyptiacum minus, foliis ad limbum argenteis.) "Leaves decurrent, runcinate, ſpinous; peduncles ſomewhat downy, one-flowered; calyxes egg-ſhaped, mucronate, not pungent." *Root* annual. *Stem* a foot high, zig-zag, ſmooth, alternately branched. *Leaves* ſmall, oblong, green, ſpotted with white, eſpecially about the indentures. *Flowers* ſmall, purple, ſcarcely opening, terminal; peduncles very long, one-flowered, downy, erect; calyx falling off entire with the ripe ſeeds; ſcales cloſely imbricated, erect; down capillary. Linn. and Lam. A native of Egypt. 21. C. *cyanoides*, Linn. Sp. Pl. 9. Mart. 13. Lam. 9. Willd. 19, 20. α. *monoclonos*, Gmel. ſib. 2. p. 42. tab. 15. β. *polyclonos*, tab. 16. "Leaves decurrent, pinnatifid, linear, entire, without ſpines, petioled, downy underneath." *Root* perennial. *Stem* in α. nearly ſimple, with few leaves; in β. much branched, the upper leaves much dilated at the baſe, the lower ones with linear pinnæ. *Down* capillary. Willdenow makes them diſtinct ſpecies. A native of Tartary. 22. C. *canus*, Linn. Mant. 108. Mart. 14. La Marck 10. (Carduus tuberoſus, Jacq. Vind. 280. from the deſcription. Auſt. 1. tab. 42, 43. Cnicus canus, Willd. 4. Cirſium tomentoſum radice bulboſa, Bauh. hiſt. 3. p. 44. C. montanum maximum, Rai. hiſt. p. 305.) "Leaves decurrent, lanceolate, toothed, a little cobwebbed, with hairs on both ſides." *Roots* perennial, ſpindle-ſhaped, aggregate, fleſhy, white. *Stem* four feet high, green, angular, cobwebbed. *Leaves* ſomewhat ſcolloped, toothed; fringed with white, ſcarcely pungent ſpines; keeled. *Flowers* ſolitary, purple, terminal; peduncles long, with a few ſmall floral leaves; calyx not pungent, marked with a white line on the outſide. Linn. *Down* feathery. A native of Auſtria. 23. C. *pectinatus*, Linn. Mant. 279. Mart. 15. Lam. 11. Willd. 21. "Leaves decurrent, lanceolate, pinnatifid-pectinate; peduncles very long; flowers drooping as the ſeed ripens." *Root* biennial. Whole plant ſmooth. *Stem* two feet high, erect. *Leaves* with a pale keel, deeply toothed, ſo as to reſemble a comb; teeth equal, lanceolate, large, entire, but ſlightly ciliated; ending in a ſoft ſpine, and furniſhed at their baſe with a ſmall deflexed tooth. *Flowers* purple, the ſize of the common burdock, terminal; peduncles very long, one-flowered, ſomewhat downy; calyx-ſcales linear, ſpreading; anthers white; piſtil long. Linn. Raiſed by Linnæus from ſeeds brought among other kinds from Pennſylvania. 24. C. *alpeſtris*, Willd. 23. Waldſt. and Kitaib. pl. rar. Hung. "Leaves ſemi-decurrent, pinnatifid, acuminate; ſegments two-lobed, ciliate-ſpinous; peduncles downy; calyx-ſcales linear-awl-ſhaped, ſpreading." *Stem* a foot, or a foot and halfhigh, ſimple. *Leaves* green on both ſides. *Flowers* purple, two or three at the top of the ſtem; peduncles leafleſs, downy. *Seed-down* capillary, rough. A native of the Croatian Alps. 25. C. *defloratus*, Linn. Sp. Pl. 21. Mart. 16. Lam. 12. Willd. 24. Jacq. Auſt. tab. 89. Hall. helv. 677. tab. 18. fig. 2. "Leaves decurrent, lanceolate, ſerrated, ſomewhat ciliated with ſpines, ſmooth; peduncles very long, woolly, one-flowered." *Root* perennial. Whole plant ſmooth. *Stem* ſometimes ſimple, only a foot high, one-flowered; ſometimes branched, a foot and half high. *Leaves* dark green, peduncles leafleſs, a little cottony towards the ſummit. *Flowers* purple, often drooping as the ſeeds ripen. *Down* capillary. A native of Auſtria, Switzerland, and the ſouthern provinces of France. 26. C. *ſeminudus*, Willd. 25. "Leaves ſemi-decurrent, ſerrated, ſpinous, grey underneath; peduncles very long, one-flowered, woolly." Similar to the preceding, but its leaves are ſhorter, grey underneath, and leſs deeply ſerrated; the calyx-ſcales ſpreading. A native of the northern parts of Perſia. 27. C. *medius*, Lam. 13. Gouan. Illuſt. 62. tab. 24. Mart. 43. excluding the reference to Allioni pedem. (Cnicus Gouani, Willd. 6.) "Leaves decurrent, pinnatifid, ſpinous at their edges; ſtem one-flowered; calyx-ſcales without ſpines, ſpreading, briſtle-ſhaped." Similar to C. defloratus, but its leaves are villous underneath, larger and more divided. *Root* perennial. *Stem* a foot and half high, ſimple. A native of the Pyrenées. 28. C. *carlinæfolius*, Lam. 14. Willd. 8. Vahl. Symb. i. p. 67. "Leaves decurrent, ſmooth on both ſides, pinnatifid; pinnæ angularly cut, ſpinous; peduncles one-flowered, woolly under the flower." Lam. *Stem* a foot and half high, erect, branched, ſmooth, ſpinous, woolly near the ſummit. *Leaves* reſembling thoſe of the preceding ſpecies in ſhape, but ſmooth on both ſides; ſpines ſtrong, yellowiſh. *Flowers* purple, ſeldom more than three; calyx-ſcales lanceolate-awl-ſhaped, ſpreading, rather pungent. Vahl. A native of the ſouth of France. 29. C. *carlinoides*, Mart. 42. Willd. 7. Gouan Illuſt. 62. tab. 23. (Carlina pyrenaicus, Linn.? Carduus tomentoſus pyrenaicus, Tourn. Inſt. 441.) "Leaves decurrent, pinnatifid, downy; ſegments palmate, ſpinous; flowers cluſtered." Vahl. *Root* perennial. *Stem* a foot high, or more, white with down, ſometimes panicle-branched; branches axillary, alternate, ſolitary. *Root-leaves* three or four inches long, ſomewhat lanceolate, petioled, very woolly; pinnules on each ſide from twelve to fifteen, imbricated, three or five-cleft, the lobes alternately ſmaller, ending in a ſtrong yellow ſpine. *Stem-leaves* crowded, very like thoſe of the root, but as they approach the top of the ſtem the pinnules are narrower and leſs palmated. *Flowers* purple, from four to eight; peduncles ſhort, woolly; calyx in flowering time very ſmooth, green, acuminate-egg-ſhaped; ſcales looſely imbricated, but not ſquarroſe, nearly equal, a little pungent; the inner ones ſometimes violet-purple, more ſlender, flexible and ſoft. Gouan. A native of the Pyrenées, and of the Alps about Col Tende. La Marck believes it to be the carlina pyrenaicus of Linnæus. 30. C. *argemone*, Lam. 15. "Leaves decurrent, broadly egg-ſhaped, twice pinnatifid, ciliated, ſmooth on both ſides; peduncle terminal, one-flowered." Lam. *Stem* about a foot high, ſimple, ſmooth. *Leaves* ciliated, with very ſmall ſpines. *Calyx* ſmooth; ſcales cloſe, not pungent. Deſcribed from a ſingle ſpecimen in the herbarium of Thouin, brought from the Pyrenées by abbé Pourret. 31. C. *monſpeſſulanus*, Linn. Sp. Pl. 10. Lam. 17. Mart. 17. Gouan. Monſp. 422. (Cnicus Monſp. Willd. 9. Cirſium foliis non hirſutis, floribus compactis, Bauh. pin. 377.) "Leaves decurrent, lanceolate, ſomewhat repand, or angularly ſcolloped, ſmooth, unequally ciliated; peduncles alternate; calyxes not pungent." Linn. *Root* perennial. *Stem* four feet high, channelled, a little branched, greeniſh below, ſlightly cottony towards the ſummit. *Leaves* almoſt entire, a little glaucous, the lower ones entirely decurrent, middle ones ſemi-decurrent, upper ones ſeſſile. *Flowers* purple, remarkably ſmall for the ſize of the plant; calyx-ſcales ſmall, expanding at the points. *Down* feathery. A native of the ſouth of France. 32. C. *pyrenaicus*, Lam. 18. Mart. 45.? Jacq. obſ. 4. p. 11. tab. 95. Gouan. illuſt. 63. (Cirſium pyrenaicum

cum altiſſimum, Tourn. Inſt. 448. Cnicus pyrenaicus, Willd. 5.) "Leaves decurrent, lanceolate, a little repand, downy underneath, ciliate-ſpinous; flowers cluſtered." Lam. Perhaps only a variety of the preceding: it is, however, larger, and conſtantly diſtinguiſhed by its leaves being cottony and whitiſh underneath, by the long, yellowiſh-white, pungent ſpines with which the leaves are ciliated, and by its cluſtered flowers at the top of the ſtem. The root-leaves are more than a foot long, narrowing into a petiole. Lam. A native of the Pyrenées. We are in doubt whether the pyrenaicus of profeſſor Martyn be the ſame plant. His only ſynonyms are Jacq. obſ. 4. 11. Ger. Prov. 179. n. 13. and Allion. pedem. n. 549. tab. 12. neither of which are quoted either by La Marck or Willdenow. His ſpecific character accords ſufficiently with La Marck's, except in deſcribing the leaves as downy on both ſides; but his larger deſcription taken from Allioni does not ſeem to be conſiſtent with it. It is as follows. *Stem* three feet high, or more, ſtriated, green, ſmooth. *Leaves* alternately ſeſſile, and decurrent with ears; almoſt winged, or very deeply gaſhed, with few teeth, ending in a longer ſpine; the whole edge ciliate with ſhort ſpines. *Flowers* at the top, three or four, with a ſmall leaf under each; peduncles cobwebbed. Top of the ſtem almoſt naked; calyx-ſcales not pungent, linear, reflected at the end. This deſcription agrees better with C. pratenſis of La Marck, which is certainly not the pratenſis of the Engliſh botaniſts; but there are ſome differences, as will appear from the following deſcription. 33. C. *ambiguus*, (C. pratenſis, Lam. 23. C. pratenſis aſphodeli radice, foliis profunde et tenuiter laciniatis, Bauh. pin. 377.) "Leaves ſemi-decurrent, pinnatifid-laciniate, ciliated, ſmooth on both ſides; flowers generally ſolitary, peduncled." *Root* perennial. *Stem* three or four feet high, ſtriated, a little branched. *Leaves* ſmooth, and green on both ſides; ſpines not pungent; root leaves long, pinnatifid; pinnules cut into deep ſegments; lower ſtem leaves cut in the ſame manner, and at leaſt ſemi decurrent; upper ones ſmaller, leſs divided, leſs decurrent, many of them ſeſſile. *Flowers* purple, reſembling thoſe of C. monſpeſſulanus. A native of the ſouth of France, deſcribed by La Marck from a living plant. La Marck obſerves that it may poſſibly be C. tuberoſus of Linnæus, but not all his ſynonyms. 34. C. *chius*, Mart. 20. Jacq. hort. 3. tab. 5. "Lower leaves ſemi-decurrent, ſemi-pinnatifid, ciliate-ſpinulous; upper ones embracing the ſtem or ſeſſile; ſtem not ſpinous; peduncles one-flowered." Nearly allied to the preceding, if it be more than a variety. *Stems* five or ſix feet high, branched from top to bottom, angular, villous, erect. *Leaves* lanceolate-oblong; the upper ſurface almoſt ſmooth, and deep green; the lower ſomewhat villous, and paler, but no where woolly; acuminate and pinnatifid; ſegments lanceolate, ciliate-ſpinous, ſcarcely pungent; root-leaves a foot and half long. *Flowers* purpliſh fleſh-colour, erect; peduncles terminal on each branch, one-flowered, near the flower a little woolly, and aſh-coloured; calyx egg-ſhaped, not hirſute; ſcales with an oblong, glutinous bump on the back, ending in a ſhort, ſoft, dark purple ſpine. *Seeds* ſhining: down feathery. A native of Chios, received by Jacquin about the year 1770, from Marſigli of Padua. 35. C. *creticus*, Lam. 20. (Cirſium creticum altiſſimum, C. lanceolati-folio. Tourn. Cor. 32.) "Leaves decurrent, pinnatifid, ſmooth underneath; ſegments divaricated, ſpinous; flowers ſmall, cluſtered; calyx ſcales ſmall, ſomewhat ſpinous." *Stem* a little branched near the ſummit, ſpinous, ſtriated, almoſt ſmooth. *Leaves* reſembling thoſe of C. lanceolatus, but narrower. *Flowers* purple; calyx globular. A native of the Iſle of Candia, deſcribed by La Marck from a dried ſpecimen in the herbarium of Juſſieu. 36. C. *pannonicus*, Linn. jun. Supp. 348. Mart. 18. Lam. 22. Willd. 26. (C. ſerratuloides; Jacq. auſt. v. 3. tab. 5. Cirſium anguſtifolium non laciniatum; Bauh. pin. 377.) "Leaves ſemi-decurrent, naked, undivided, ciliated; flower often ſolitary." *Root* perennial. A native of Hungary and Auſtria. 37. C. *parviflorus*, Linn. Mart. 279. Mart. 21. Lam. 23 Willd. 27. (Cirſium pratenſe alpinum polycephalum, aſphodeli radice; Tourn. Inſt. 448.) "Leaves adnate at the baſe, ſcarcely decurrent, lanceolate, naked, irregularly ſcolloped, ciliated with weak ſpines." *Root* perennial. *Stem* upright. *Leaves* green on both ſides. *Flowers* white, terminal, peduncled, the ſize of thoſe of Serratula tinctoria; calyx egg-ſhaped; ſcales with a white keel, ending in a ſoft ſpine; ſtyles long. A native of mountains in the ſouth of Europe.

** *Leaves not decurrent.*

38. C. *Caſabonæ*, Linn. Sp. Pl. 12. Mart. 23. Lam. 24. (Cnicus caſabonæ; Willd. 42. Acarna major, caule non folioſo; Bauh. pin. 379. Acarna Theophraſti anguillaræ; Lob. ic. 2. Barrel. ic. 1221.) "Leaves ſeſſile, narrow-lanceolate, perfectly entire, flat; downy underneath, armed with triple ſpines on the edge; flowers axillary, ſeſſile, in a kind of ſpike; calyx-ſcales lanceolate, ſpinous, ſpreading." *Root* biennial. *Stem* two or three feet high (ſix, Mart.) perfectly ſimple, upright, channelled, whitiſh or reddiſh, thick ſet with leaves in its whole length. *Leaves* acute, ſmooth, bright green above, very white or ſaffron-coloured underneath; ſpines very ſharp, yellowiſh. *Flowers* purple. A native of the ſouth of France and Italy. The trivial name is derived from Caſabona, herbariſt to the grand duke of Tuſcany, who ſent the ſeeds to J. Bauhin. 39. C. *afer*, Jacq. hort. Schoenb. 2. tab. 145. (Cnicus afer; Willd. 3.) β. C. diacantha, Mart. 48. Billard ic. pl. Syr. 2. p. 7. tab. 3. "Leaves ſeſſile, lanceolate, downy underneath, ſomewhat ſcolloped, lobes emarginate, armed with double ſpines; flowers peduncled, in a kind of corymb; calyx-ſcales lanceolate, ſpinous, remarkably ſpreading." The ſeparation of the indentures is more angular in α than in β, but there is no other difference, Willd. *Root* annual. *Stem* two feet high, ſtraight, ſimple, ſtriated, downy. *Leaves* ſmooth above, but the nerves are white with down; ſpines at the edge ſometimes, but rarely, ternate or ſolitary, unequal, diverging, yellow; the end one ſingle. *Flowers* few, violet; peduncles ſingle, ſtriated, downy, ſometimes furniſhed with one or two leaves; calyx egg-ſhaped; ſcales lanceolate-egg-ſhaped, pubeſcent, ending in a long, awl-ſhaped, rigid, ſharp dagger-point, the lower ones reflexed; ſegments of the florets awl-ſhaped, upright, unequal; ſtigma jointed, awl-ſhaped, ſeldom bifid. *Seeds* inverſely egg-ſhaped, very ſmooth, brown; down whitiſh, feathery, Billardiere; α is a native of Barbary; β. of Syria. 40. C. *hiſpanicus*, Lam. 25. (Carduus polyacanthos hiſpanicus; Tourn. Inſt. 441. Barr. ic. 474.) "Leaves ſeſſile, lanceolate, waved, downy underneath, furniſhed at the edge with very long ſpines not proceeding from the ſame point; flowers in a kind of corymb." *Root* perennial, long, woody, bearing on its crown the remains of former leaves which give it a ſcaly appearance. *Stem* not more than twelve or fifteen inches high, ſimple, thick, ſomewhat woody, ſtriated, whitiſh and cottony, thick-ſet with leaves. *Leaves* very ſmooth above. *Flowers* large; peduncles about an inch long; calyx formidably ſpinous. A native of Spain. 41. C. *gnaphaloides*, Mart. 50. Cyrill. rar. neap. 1. 27. tab. 9. "Leaves ſeſſile, in a ſort of whorl, quite entire, downy underneath." *Root* perennial, woolly, ſpringing from the clefts of rocks whence the plant hangs. *Stems* one or two feet high, much branched, white, with a cloſe nap, clothed with leaves from top to

bottom. *Leaves* lanceolate-linear, two or three inches long, green and ſmooth above, except at the baſe, a little rolled back on the ſides; thoſe of the former year remaining withered and dry at the bottom of the ſtem. *Flowers* purple, terminal; calyx egg-ſhaped, contracted at the top, glaucous green; ſcales ſimple, ſtiffiſh, acute but not pungent; anthers purple, each terminating at the bottom in two cirrhi; filaments very hairy at the top. *Seeds* egg-ſhaped, grey; down very long. A native of the Upper Calabria, gathered in 1783 by Angelo Fuſani. Before that it was known to exiſt only in the Herbarium of Ferrantes Imperati, under the name of Jacea. 42. C. *ſtellatus*, Linn. Sp. Pl. 13. Mart. 24. Lam. 26. Foliis integris, flore purpureo, Tourn. 440. (Cnicus ſtellatus, Willd. 44.) "Leaves ſeſſile, linear-lanceolate, entire, not pungent, downy underneath; axillary ſpines in pairs, ſomewhat branched; flowers ſeſſile, lateral, and terminal." In habit reſembling *Centaurea calcitrapa*. *Root* annual. *Stem* a foot high, much branched, a little cottony. *Leaves* three inches long, green above, very narrow at the baſe. *Flowers* purple, ſolitary; peduncles with two or three floral leaves; calyx-ſcales long, ſharp, pungent. A native of Sicily and the county of Nice. 43. C. *dentatus*. (Cnicus dentatus, Willd. 41.) "Leaves embracing the ſtem, lanceolate, doubly toothed, ſpinous, woolly underneath; ſtem one-flowered; calyx-ſcales lanceolate-egg ſhaped, mucronate, preſſed cloſe." *Stem* half a foot high or more, ſimple, erect, furrowed, eſpecially near the flower. *Leaves* on the ſtem generally four; lower ones ſomewhat petioled; upper ones embracing the ſtem, narrowed at the baſe. Deſcribed by Willdenow from a dried ſpecimen. Native country unknown. 44. C. *virginianus*, Linn. Sp. Pl. 18. Mart. 29. Lam. 40. Willd. 30. Gron. Virg. 117. Jacq. Obſ. 4. p. 13. tab. 99. (Cirſium minus virginianum, Moriſ. Hiſt. 3. p. 150. Rai Sup. 197.) "Leaves ſeſſile, lanceolate, edged with ſpinous teeth, downy underneath; ſtem leafy, one-flowered; calyx not pungent." Linn. "Calyx-ſcales mucronate." Willd. *Stem* ſlender, a foot or eighteen inches high, furniſhed with 26 or 28 leaves, which diminiſh in ſize from the bottom to the top. *Flower* purple. A native of Virginia. 45. C. *linearis*, Mart. 22. Willd. 35. Thunb. Jap. 305. "Leaves ſeſſile, linear, ciliate-ſpinous, ſmooth; flowers terminal, ſolitary." *Stem* a foot high, herbaceous, erect, round, ſtriated, not ſpinous; branches alternate, ſpreading, a little downy near the top. *Leaves* two inches long, ſpreading. *Flowers* ſmall; calyx a little downy at the baſe. A native of Japan. 46. C. *giganteus*, Deſf. Atl. 2. p. 245. tab. 221. C. ſcaber, Poiret. Itin. 2. p. 201. (Cnicus giganteus, Willd. 19.) "Leaves embracing the ſtem, egg-ſhaped, ſcolloped, beſet with briſtly hairs, downy underneath; lobes ſpinous; peduncles about three-flowered; calyxes globular; ſcales egg-lanceolate, ſpinous, preſſed cloſe. A native of Algiers. 47. C. *lanatus*. (Cnicus lanatus, Willd. 21.) "Leaves ſeſſile, lanceolate, ſcolloped, ſmooth, downy underneath, ſpinous at the edges; calyxes oblong; ſcales egg-ſhaped, mucronate, recurved." *Stem* erect, ſtriated, ſmooth, branched. *Leaves* two inches long. *Peduncles* naked, one-flowered, pubeſcent. Similar in habit to C. *arvenſis*. A native of the Eaſt Indies, communicated to Willdenow by Dr. Roxburgh. 48. C. *ſyriacus*, Linn. Sp. Pl. 15. Mart. 26. Lam. 27. (C. maculis albis exoticus, Bauh. pin. 381. C. latifolius echinos obſoletæ purpuræ ferens, Bauh. pin. 380. C. lacteus ſyriacus, Cam. Hort. 35. tab. 10. Cnicus ſyriacus, Willd. 45.) "Leaves embracing the ſtem, oblong, toothed, ſpinous, white-veined; flowers nearly ſeſſile, bracteated; calyx-ſcales oblong-lanceolate, preſſed cloſe, mucronate." Willd. *Root* annual. *Stem* two or three feet high, erect, ſimple, almoſt ſmooth. *Leaves* angularly ſcolloped, green, ſpotted with white; lower ones narrowed into a petiole. *Flowers* white, ſometimes purple, ſolitary, lateral, and terminal; bractes four or five, with ſtrong white nerves, ending in a ſpine; down feathery. A native of Syria, Candia, and Spain. 49. C. *flaveſcens*, Linn. Sp. Pl. 24. Mart. 35. Lam. 48. Cavan. Hiſp. ic. 1. p. [illegible] n. 52. tab. 46. Krock. Sileſ. n. 1346. (Cnicus flaveſcens, Willd. 46.) "Leaves lanceolate, entire, ſmooth, toothed, not pungent; flowers leafleſs, with ſoft ſpines." Linn. *Root* annual. *Stem* eighteen inches high, upright, grooved, ſmooth, ſparingly branched. *Leaves* alternately ſcattered, attenuated to the baſe, ſometimes a little decurrent, unequally toothed; teeth ending in a little evaneſcent briſtle, ſlightly channelled, and ſomewhat rigid. *Flowers* yellowiſh white, terminal, ſolitary; calyx cylindrical, oblong, broader at the baſe; ſcales linear, all preſſed cloſe, yellow, ending in a weak ſpine. *Seeds* top-ſhaped, four-cornered; down abundant, feathery. Cav. Found in Spain by Loefling, and in Sileſia by Krocker. 50. C. *leucanthus*, Willd. 34. Cavan. ic. 2. p. 52. tab. 165. "Leaves oblong-lanceolate, ſeſſile, ſmooth, ſerrated, not pungent; ſtem one-flowered; calyx-ſpines reflexed." *Root* annual. A native of Spain. 51. C. *heterophyllus*, Linn. Sp. Pl. 20. Mart. 30. Engl. Bot. tab. 675. (Carduus helenoides, Lam. 42. Hudſ. p. 352. Lightf. p. 457. With. p. 702. Hull. p. 179. Cnicus heterophyllus, Willd. 24.) Melancholy thiſtle. "Leaves embracing the ſtem, lanceolate, ciliated, entire; ſometimes, but rarely, laciniated; downy underneath, flower often ſolitary, peduncled." *Root* perennial, knotty, black. *Stem* three feet high or more, erect, generally ſimple, one or two-flowered, round, furrowed, woolly. *Leaves* acute, green, ſmooth above, white with down underneath, doubly ciliated with ſmall ſpines at the edges, occaſionally pinnatifid, whence the trivial name; root-leaves gradually leſſening into rather long petioles; ſtem-leaves numerous, alternate, heart-ſhaped at the baſe. *Flower* purple, terminal, at firſt nodding, afterwards erect, large; peduncle elongated, downy, either naked, or with a ſhort leaf immediately under the flower; calyx egg-ſhaped, ſlightly pubeſcent; ſcales lanceolate, erect, naked at the tip, keeled, browniſh, ending in a ſhort, obſolete ſpine; anthers white; ſtigma linear, exſerted, purple, emarginate. *Down* of the marginal ſeeds nearly rough, of the reſt feathery; a proof that Willdenow is not ſupported by nature in making its ſtructure in this reſpect a ſufficient generic diſtinction. There is frequently a ſmaller flower, on a rather long peduncle, in the axil of one of the upper leaves. A native of Switzerland, Dauphiny, and of the mountainous parts of England, Wales, and Scotland, flowering in July and Auguſt. 52. C. *helenoides*, Linn. Sp. Pl. 21. Mart. 31. (Cnicus helenoides, Willd. 25.) "Leaves embracing the ſtem, lanceolate, toothed, ciliated with ſmall unequal ſpines; ſtem ſpineleſs." Linn. In habit much reſembling the preceding, but twice the height. *Root* perennial, ſcarcely creeping. *Stem* furrowed, leafy from the top to the bottom. *Leaves* from 40 to 50, white underneath, but not ſnowy white, as in C. *heterophyllus*, toothed, not laminated, half embracing the ſtem with round, reflexed, adnate auricles; floral leaves awl-ſhaped. *Flowers* four or five at the top of the ſtem, only half the ſize of thoſe in the preceding ſpecies. Willd. from a living plant. A native of Siberia. Dr. Smith aſſures us that he has not ſeen it either wild or cultivated in Great Britain. 53. C. *pratenſis*, Mart. 40. Hudſon, p. 353. Withering, p. 701. Smith Flor. Brit. 10. Eng. Bot. Pl. 177. (C. diſſectus, Linn.? Hudſ. 1ſt Ed. C. heterophyllus, Rel. 306. Lightf. p. 456. C. anglicus, Lam. 43. Cirſium anglicum, Ray. Syn. 193 Lob. Ic. 583. Ger. Emac. 1183. Pet. Herb. Brit. tab. 22. *fig.* 1. Cnicus pratenſis, Willd. 23.) Meadow thiſtle. "Leaves ſeſſile, lanceolate, ſomewhat

what toothed, ciliated, woolly underneath; ſtem nearly naked, one-flowered; calyx villous." *Root* perennial, creeping; fibres long, ſimple, fleſhy. *Stem* erect, about a foot and half high, ſimple, ſeldom more than one-flowered, round, ſurrowed, woolly. *Leaves* unequally toothed, ſometimes a little ſcolloped, ciliated with ſtronger and more pungent ſpines than thoſe of C. heterophyllus, roughiſh, cobwebbed beneath, but not ſnowy white; root-leaves three or four, petioled; ſtem-leaves two or three, ſmaller, remote, embracing the ſtem. *Flower* purple, terminal, at firſt nodding, afterwards erect; peduncle a little thickened at the top, ſnowy white; ſcales lanceolate, erect, ending in a weakiſh ſpine; down as in C. heterophyllo. A native of marſhy places in France and England. We are informed by Dr. Smith, (Eng. Bot.) that Linnæus took up his diſſectus from books, without having it in his herbarium. All his ſynonyms are ſaid by La Marck to belong to the preſent plant, ſpecimens having been ſent him from the neighbourhood of Orleans, which perfectly agree with Lobel's figure. It ſeems, therefore, probable that he accidentally prefixed an erroneous ſpecific character to his ſynonyms, and that his diſſectus has no ſeparate exiſtence. 54. C. *ſerratuloides*, Linn. Sp. Pl. 22. Mart. 32. Lam. 47? Gmel. Sib. ii. p. 52. tab. 22, and 23. *fig.* 1. Jacq. Vind. 281. Auſt. 2. tab. 127. (Cnicus ſerrulatoides, Willd. 26.) "Leaves embracing the ſtem, lanceolate, entire; ſerratures ſpinous briſtle-ſhaped; peduncles one-flowered." Linn. "Leaves ſeſſile, lanceolate, remotely ſerrated, ciliated, with ſmall ſpines, green on both ſides; calyxes not pungent, globularly conic; down feathery, very long." Lam. According to Linnæus it differs from C. helenoides in its ſmaller, ſcarcely furrowed ſtem, and narrower leaves, with the floral ones lanceolate, not awl-ſhaped. Willdenow adds that in this ſpecies the ſtem is branched, and the leaves green on both ſides. La Marck aſſerts, that his ſerratuloides reſembles his helenioides (which, however, is heterophyllus), in nothing but the generic character. It appears, nevertheleſs, from his deſcription, that there are many points of reſemblance, and that his plant is probably the ſerratuloides of Linnæus, as we think it certainly is that of Willdenow and Jacquin, though Jacquin ſays the ſtem is ſimple when wild, and branched only when cultivated. A native of Siberia, Swiſſerland, and Auſtria. 55. C. *tartaricus*, Linn. Sp. Pl. 23. Mart. 33. Lam. 33. Jacq. Auſt. tab. 90. (Cnicus Tartaricus, Willd. 35.) "Leaves embracing the ſtem, lanceolate; ſerratures ſpinous awl-ſhaped; flowers with three leaves." Linn. "Leaves embracing the ſtem, oblong-lanceolate, toothed, ciliate-ſpinous; peduncles one-flowered; calyxes bracteated; ſcales lanceolate, ſpinous. Willd. Habit and ſize of the preceding. Linn. *Root* perennial. *Stem* a foot and a half high, ſmooth, ſometimes ſimple, and ſometimes with a branch or two, each bearing a ſingle flower. *Leaves* a little ſcolloped, toothed, ſmooth on both ſides; root-leaves large, petioled; ſtem-leaves rather diſtant. *Flower* yellowiſh white; bractes generally three, ſmall, lanceolate, ciliated. La Marck. Calyx-ſcales with a white keel. Linn. A native of Siberia and the Alps. 56. C. *carniolicus*, Mart. 41. (Cnicus carniolicus, Willd. 33. Cirſium carniolicum, Scop. Carn. n. 1005. tab. 54.) "Leaves heart-ſhaped, embracing the ſtem, oblong-egg-ſhaped, toothed, ciliated; root-leaves oblong, obtuſe, ſcolloped, ciliated; flowers terminal, ſomewhat cluſtered; calyxes involucred; ſcales linear-lanceolate, ſpreading. Willd. *Root* perennial. *Stem* hairy. *Root-leaves* petioled, hairy on both ſides; petioles hairy. *Flowers* yellowiſh white; calyx involucred, with three lanceolate ciliate leaves. Willd. 57. C. *anguſtifolius*, Lam. 34. "Leaves ſeſſile, long, narrow; tooth-pinnatifid, ciliated; flower involucred by about ſix linear bractes. *Stem* near two feet high, a little branched, and ſomewhat woolly. *Leaves* green, ſmooth on both ſides, ſome oppoſite, others alternate. *Flowers* ſolitary, terminal. Cultivated in the royal garden at Paris, and ſaid to be a native of the Alps. 58. C. *acanthifolius*, Lam. 32. (Cnicus pratenſis acanthi folio, flore flaveſcente, Tourn. Inſt. 450. Carduus pratenſis latifolius, Bauh. Pin. 376. Cirſium, Hall. 173.) "Leaves embracing the ſtem, long, pinnatifid; pinnules parallel, ciliate-ſpinous; bractes concave, entire, rather coloured, covering the flowers." Nearly allied to the three preceding. *Root* perennial. *Stem* ſtriated, ſmooth, weak. *Leaves* large, diſtant, pale green; lower ones narrowing into the petiole. *Flowers* yellowiſh white, terminal, cluſtered; bractes ciliated. A native of meadows in many parts of Europe. 59. C. *pauciflorus*. (Cnicus pauciflorus, Willd 34. Waldſt. and Kitaib. Pl. Rar. Hung.) "Leaves embracing the ſtem, egg-ſhaped, ſomewhat lyrate, ciliate-ſerrated, rugged; root-leaves lyrate; flowers cluſtered; calyx-ſcales lanceolate; the inner ones ſpreading." *Root* biennial. *Stem* naked towards the top, with three or four cluſtered, terminal flowers. *Leaves* paler underneath; root-leaves a foot long, oblong, broad, a little ſcolloped. A native of Hungary. 60. C. *antarcticus*, Vill. Delph. iii. p. 12. tab. 19 (Cnicus antarcticus, Willd. 32.) "Leaves heart-ſhaped, embracing the ſtem, pinnatifid, lanceolate at the top, ciliate-ſpinous, rather woolly underneath; flowers cluſtered; calyx-ſcales lanceolate egg-ſhaped, mucronate, ſpreading at the tip." *Root* perennial. *Leaves* dilated at the baſe, pinnatifid and toothed in the middle, elongated, and lanceolate at the end. *Flowers* white, terminal. 61. C. *ſemipectinatus*, Lam. 41. "Leaves embracing the ſtem, entire at the baſe, pinnatifid-pectinate towards the top, green on both ſides; branch-leaves very entire; flowers rather cluſtered, terminal." *Root* perennial. *Stem* two or three feet high, more or leſs branched. *Leaves* divided in their upper part into lanceolate ſegments reſembling the teeth of a comb, each ending in a ſpine. *Flowers* two or three together, pale or yellowiſh, acquiring a purple tint from the colour of the anthers; calyx ſmooth, not pungent. Cultivated in the royal garden at Paris, ſuppoſed to have been brought from Tartary. 62. C. *montanus*. (Cnicus montanus, Willd. 31. Waldſt. and Kitaib. Pl. Rar. Hung.) "Leaves embracing the ſtem, pinnatifid, rugged, ſpinous-ciliated; ſegments alternate, oblong-lanceolate three-nerved; ſtem branched; flowers cluſtered: calyx-ſcales egg-ſhaped, ſpreading at the tip." *Root* perennial. *Flowers* purple. A native of dry mountains in Croatia. 63. C. *rivularis*, Mart. 36. Jacq. Auſt. i. tab. 91. (Cnicus rivularis, Willd. 30.) "Leaves toothed, ciliated, naked, embracing the ſtem; root and lower ſtem ones pinnatifid; flowers cluſtered, capitate; calyx-ſcales lanceolate-egg-ſhaped, preſſed cloſe." Willd. *Root* perennial. *Stem* uſually ſingle, two or three feet high, erect, round, hollow, a little villous, angular at the bottom, ſtriated at the top, with a few diſtant bractes; generally quite ſimple but ſometimes with ſhort, one-flowered, axillary branches; ſometimes, eſpecially towards the top, covered with a white wool; ending either in a ſingle flower, or a few collected into a head, rarely ſix or ſeven, and in that caſe the lower ones are peduncled. *Leaves* ſomewhat villous, deeper green above, whitiſh underneath; root ones lanceolate, narrowing into the petiole. *Flowers* purple; calyx egg-ſhaped, ſomewhat glutinous, but not villous; ſcales lanceolate-acuminate, not pungent, outer ones dark green, inner ones dark purple and gradually longer; down ſomewhat ſcattered. A native of Auſtria and Hungary. Profeſſor Martyn has quoted Scopoli n. 1005. tab. 54. under both C. carniolicus and C. rivularis, adding to the latter a reference to Jacquin, and by referring from one to the other, ſeems to think they may poſſibly be the ſame plant. He has nevertheleſs given diſtinct deſcriptions of each, of the former from Scopoli, and of the latter from Jacquin, which do not very well accord with each other. Willdenow, who had dried ſpecimens of both, has kept them ſeparate. 64. C. *ſaliſburgenſis*, (Cnicus ſaliſburgenſis; Willd. 29.) "Leaves toothed, ciliated, naked; ſtem-leaves embracing the ſtem, pinnatifid, root ones undivided, oblong; ſtem two-flowered; calyx-ſcales egg-lanceolate, preſſed cloſe." *Root* perennial. *Stem* hairy. *Leaves* ſmooth, beſet with very ſhort, ſcattered hairs. A native of moiſt meadows about Saltzburg. 65. C. *rigens*, Mart. 47. Hort. Kew. 3. p. 144. La Chenal in Act. Helv. 4. p. 294. tab. 16. (Cnicus rigens; Willd. 28. Cirſium; Hall. n. 176.) "Leaves oblong-lanceolate, ſmooth, ſpinous at the edges, pinnatifid; ſegments obliquely lobed; calyxes oblong, bracteated." Martyn ſuppoſes it to be the ſame with C. antarcticus of Villars, ſee n. 57. A native of Switzerland. 66. C. *Allionii*, (Cnicus medius; Willd. Cirſium medium. Allion. ped. n. 542. tab. 49.) "Leaves ſeſſile, pinnatifid; ſegments generally three-cleft, ciliate-ſpinous; ſtem branched, calyxes naked; ſcales, egg-lanceolate, mucronate, preſſed cloſe." *Root* perennial. Perfectly diſtinct from C. medius of Gouan (ſee n. 27.) which has been quoted as a ſynonym, notwithſtanding it has decurrent leaves. Willd. from a living plant. 67. C. *radiatus*, Willd. 28. "Leaves pectinate-pinnatifid, naked, rugged; ſegments linear, not pungent, terminal one egg-ſhaped; upper leaves ſeſſile; calyx-ſcales egg-ſhaped, mucronate; inner ones elongated, linear, coloured." *Root* perennial. *Stem* branched, many-flowered. *Leaves* green on both ſides; lower ones petioled. *Flowers* violet. *Down* capillary. A native of calcareous mountains in Hungary. 68. C. *lycopifolius*, Willd. 29. Villars delph. 3. p. 23. tab. 19. "Leaves egg-ſhaped, pinnatifid-toothed, not pungent, grey underneath; upper ones ſeſſile; ſtem one-flowered; calyx-ſcales egg-ſhaped, not pungent." Similar in habit to the preceding. *Root* perennial. A native of mountains in Dauphiny. 69. C. *nitidus*, Willd. 32. Waldſt. and Kitaib. pl. rar. Hung. 1. p. 52. tab. 52. "Leaves not pungent; root-leaves egg-ſhaped, toothed, cut at the baſe; ſtem-leaves pinnatifid-linear; ſtem one-flowered; calyx-ſcales egg-ſhaped, mucronate." *Root* perennial. *Upper leaves* entire, linear-lanceolate. A native of calcareous mountains in Hungary. 70. C. *eriſithales*, Lam. 36. Jacq. Obſ. 1. p. 28. tab. 17. and Auſt. tab. 310. (Cnicus eriſithales; Linn. Sp. Pl. 4. Willd. 37. Cirſium acanthoides montanum, flore flaveſcente: Tourn. Illuſt. 448.) "Lower leaves petioled, egg-ſhaped, deeply pinnatifid; pinnules parallel, three-nerved; peduncles naked, one-flowered." *Root* perennial. *Stem* a foot and half high, generally ſimple, nearly ſmooth. *Leaves* nearly ſmooth, greeniſh; lower leaves near together, toothed, ſpinous ciliated; upper ones embracing the ſtem, diſtant, narrow. *Flowers* yellowiſh white, terminal, nodding. A native of France and other temperate parts of Europe. 71. C. *tricephalodes*, Lam. 35. (Cirſium: Hall. helv. n. 175. Cardus-cirſium maximum profunde laciniatum. Pluk. tab. 154. fig. 2.) "Leaves embracing the ſtem, pinnatifid, ſerrated, ciliated; flowers ſeſſile, about three, cluſtered at the top of the ſtem." *Root* perennial. *Stem* two or three feet high, ſimple, a little cottony under the flowers. *Lower leaves* petioled, egg-ſhaped, a little cut or doubly toothed, green and ſmooth above, with ſhort hairs on their hindmoſt nerves; upper leaves embracing the ſtem, deeply pinnatifid; pinnules parallel, narrow, ciliated. *Flowers* purple; calyx ſmooth, not pungent. A native of Auvergne and Dauphiny. La Marck obſerves, that this and the preceding have been confounded by Linnæus and Haller. 72. C. *ochroleucus*, Mart. 44. (Cnicus ochroleucus; Willd. 38. Cirſium; Allion. ped. n. 545. Hall. helv. n. 174.) "Leaves embracing the ſtem, decurſively pinnatifid, ciliated, pinnules lanceolate, three-nerved, upper ones confluent; peduncles drooping; calyx-ſcales lanceolate, reflexed." *Root* perennial. *Flowers* yellowiſh white. A native of Switzerland and Savoy. 73. C. *haſtatus*, Lam. 37. "Leaves embracing the ſtem, halbert-lanceolate, pinnatifid, grey underneath; flowers about ſeven, cluſtered at the top of the ſtem; terminal one erect." *Stem* a foot and half high, ſimple, abundantly leafy, cottony in its upper part. *Leaves* acuminate, green and ſmooth above, white and cottony underneath, pinnatifid half way down; pinnules narrow, curved upwards, ending in a weak ſpine. *Flowers* large, purple; calyx ſmooth, not pungent. A native of the Alps about Grenoble. 74. C. *erucagineus*, Lam. 38. "Leaves embracing the ſtem, pinnatifid; pinnules laciniated upwards." *Stem* two feet high or more, cottony towards the top. *Leaves* green and almoſt ſmooth above, ſlightly villous and pale underneath, ſpinous ciliated; root leaves large, petioled; ſtem ones ſmaller, embracing the ſtem. *Flowers* large, whitiſh with a red tint from the colour of the anthers, partly cluſtered ſeveral together at the top of the ſtem, partly ſolitary, peduncled, in the axils of the upper leaves; calyx ſmooth, not pungent. Cultivated in the royal garden at Paris, and ſaid to be a native of Siberia. 75. C. *altiſſimus*, Linn. Sp. Pl. 17. Mart. 28. Lam. 39. (Cnicus altiſſimus; Willd. 20. Cirſium altiſſimum; Dill. Elt. 81. tab. 69. fig. 80.) "Leaves ſeſſile, pinnatifid, ſcolloped, ſerrated, not pungent; ſtem much branched; calyxes villous, ſomewhat ſerrated." *Root* perennial. *Stem* ten or twelve feet high. *Leaves* green above, cottony and whitiſh underneath. *Flowers* purple, ſingle at the top of each branch; calyx woolly; bractes ſeveral, narrow, toothed, forming an involucrum. 76. C. *bulboſus*, Lam. 44. (C. bulboſus Monſpelienſium, ſive acanthus ſilveſtris quibuſdam, foliis laciniatis, J. Bauh. 3. p. 43. C. bulboſus monſpelienſium; Lob. ic. n. p. 10. Cirſium, Hall helv. n. 177.) "Stem naked above, with one or two flowers; leaves deeply pinnatifid; pinnules cut, lobed, ciliated, ending in a ſmall ſpine; flowers ſolitary." *Root* compoſed of ſeveral bulbs or tubes. *Stem* a foot and half or two feet high, ſlender, ſtriated, cottony, eſpecially near the top, with two or three leaves on its lower part. *Leaves* almoſt all petioled, greeniſh above, and beſet with ſhort, thinly ſcattered hairs, cottony and white underneath. *Flowers* purple, rather ſmall, terminal; ſcales egg-ſhaped-acuminate, not pungent. A native of Germany, Switzerland, and the ſouth of France. There is a variety in the neighbourhood of Paris, with leaves almoſt entirely green. La Marck obſerves that Linnæus was probably unacquainted with this plant, having erroneouſly referred Lobel's C. bulboſus to his tuberoſus from which it is perfectly diſtinct, its leaves not being decurrent. He conceives that the tuberoſus of Linnæus may poſſibly be the plant which he has deſcribed under the name of pratenſis, and which we on account of the uncertainty have called ambiguus, (ſee n. 53) pratenſis as a ſpecific name being pre-occupied. 77. C. *laciniatus*. Lam. 45. (Jacea aculeata ſ. tuberoſa; Tabern. ic. 154. "Stem leafy, branched; leaves deeply pinnatifid, green on both ſides; pinnules laciniated, ſpinous ciliated; peduncles one flowered." Diſtinct from the preceding. Its leaves are not decurrent; it therefore is not the tuberoſus of Linnæus. *Stem* a foot and half high, ſmooth, channelled. *Leaves* large, ſomewhat petioled. *Flowers* large, purple or white, peduncled; calyx not pungent. Deſcribed from a dried ſpecimen in the herbarium of Juſſieu, and ſuppoſed to be a native of the Alps. 78. C. *arvenſis*, Lam. 46. Curt. Flor. Lond. faſc. 6. tab. 57. Smith, Flor. Brit. p. 851.

p. 851. Eng. bot. 975. C. ſerratula arvenſis, Linn. Sp. Pl. Mart. Willd. Carduus vulgatiſſimus viarum, Rai ſyn. 194.) Creeping or way thiſtle. "Leaves ſeſſile, pinnatifid, ſpinous; ſtem panicled; calyxes egg-ſhaped, ſlightly ſpinous; down feathery." *Root* perennial, creeping, tapering, deſcending deep into the ground, not eaſily extirpated. *Stems* three feet high, erect, round, ſmooth, many-flowered. *Leaves* ſlightly decurrent, alternate, ſmoothiſh; lobes unequal, ciliated, ſpinous. *Flowers* purple, rarely white; calyx egg-ſhaped; ſcales broad-lanceolate, preſſed cloſe, woolly at the edges, with a ſhort, ſpreading ſpine; down deciduous, root permanent as in ſerratula. Dr. Smith. A native of moſt parts of Europe. 79. C. *diſcolor*, (Cnicus diſcolor, Willd. 189.) "Leaves ſeſſile, pinnatifid, hairy, downy underneath; pinnules two-lobed, divaricated, ſpinous; calyxes globular, cobwebbed, pubeſcent, ſcales egg-ſhaped, preſſed cloſe, ending in a ſpreading ſpine." *Root* biennial. A native of North America. 80. C. *orientalis*, (Cnicus orientalis; Willd. 17.) "Leaves ſeſſile, pinnatifid, ſmoothiſh above, downy underneath; pinnules lanceolate, ſpinous; calyxes egg-ſhaped; ſcales preſſed cloſe: outer ones awl-ſhaped, inner ones lanceolate." *Stem* downy. *Leaves* narrow, downy on the midrib above, ſnow-white underneath: pinnules with a ſpine at the tip, and at the upper part of the baſe. *Calyx* only half the ſize of that of C. lanceolatus. A native of the Eaſt. 81. C. *cynaroides*, Lam. 28. (C. creticus foliis lanceolatis, Tourn. Cor. 31. Cnicus cynaroides; Willd. 16.) "Leaves ſeſſile, oblong, pinnatifid, downy underneath; pinnules angular, divaricated, ſpinous; flower large, terminal." *Stem* erect, ſtriated, cottony. *Leaves* ſmooth, and ſhining above, very white underneath. *Flower* purple; calyx-ſcales lanceolate, pungent; outer ones reflexed, and widely ſpreading. A native of the iſle of Candia. 82. C. *ciliatus*. Hort. Kew. 3. p. 144. Murray Com. Goett. 1784. p. 35. tab. 5. (Cnicus ciliatus; Willd. 12.) "Leaves embracing the ſtem, hiſpid, pinnatifid; pinnules two-lobed, divaricated, ſpinous, downy underneath; calyxes egg-ſhaped, ſcales lanceolate, ſpinous, ciliated, reflexed." *Root* perennial. *Stems* many from the ſame root, five or ſix feet high, hairy, round, with prominent lines, and horizontal white hairs, branched on the upper part; branches about a foot long, compound, alternate, aſcending; branchlets three, ſhort, zig-zag. *Root-leaves* a foot and half long, ſpreading in all directions. *Stem-leaves* about a foot long, half embracing the ſtem, horizontal, alternate, rough, and green above, with ſtraw-coloured veins, which end in awl-ſhaped ſpines of the ſame colour. *Flowers* terminal, ſolitary, yellowiſh white; calyx cylindric, oblong, broader at the baſe; ſcales yellow, linear, preſſed cloſe, ending in a weak ſpine. *Seeds* top-ſhaped, four-cornered; down abundant, feathery. A native of Siberia. 83. C. *leucocephalus*. (Cnicus leucocephalus; Willd. 13. Cirſium creticum altiſſimum C. lanceolati folio flore albo; Tourn. Cor. 32.) "Stem-leaves ſeſſile, pinnatifid, hiſpid, downy underneath; pinnules lanceolate, ſpinous at the tip; calyxes cylindrical, alternate, villous, involucred, ſcales oblong, preſſed cloſe, ending in recurved ſpines." Willd. *Root-leaves* petioled; pinnules lanceolate, two-lobed, divaricated, ciliated at the edges, ſpinous at the tip; pinnules of the ſtem-leaves undivided, revolute at the edges; with a ſtrong, yellow ſpine at the tip, at the bottom of each indenture. *Flowers* alternate, axillary, on ſhort peduncles; involucrum of three or five leaves. A native of Crete. 84. C. *echinatus*. Deſfon. atl. 2. p. 247. (Cnicus echinatus, Willd. 14.) "Leaves ſeſſile, pinnatifid, hiſpid, woolly underneath; pinnules two-lobed, divaricated, ſpinous; calyxes egg-ſhaped, woolly, bracteated; ſcales awl-ſhaped, ſpinous, preſſed cloſe. *Stem* a foot high, erect, firm, furrowed, woolly; branches erect, forming a kind of corymb, one-flowered. *Leaves* reſembling thoſe of C. lanceolatus; hiſpid above, with numerous ſhort, yellowiſh hairs, repand-pinnatifid; lobes remote, ending in a long yellowiſh ſpine, ſolitary or in pairs, one larger. *Flowers* a third part longer than thoſe of C. lanceolatus; peduncles leafy, ſtriated, woolly; bractes narrow-lanceolate, ſurrounding the calyx; calyx egg-ſhaped, woolly; ſcales cloſely imbricated, ſpinous and looſe at the tip. Desf. A native of Barbary. 85. C. *eriophorus*. Linn. Sp. Pl. 16. Mart. 27. Lam. 29. Eng. bot. 386. (Cnicus eriophorus, Willd. 15.) Fryars crown. Fryars thiſtle. Woolly headed thiſtle. "Leaves ſeſſile, pinnatifid, in two ranks, ſpinous, rugged; pinnules alternate, erect; calyxes globular, woolly." *Root* biennial. *Stem* three or four feet high, erect, round, furrowed, ſmoothiſh, many-flowered, much branched; branches ſpreading. *Leaves* ſpreading, alternate, deeply pinnatifid with two ranks of oblong divaricated ſegments, which point alternately upwards and downwards, armed with ſtrong ſpines, rough above with ſmall rigid, cloſe-preſſed briſtles, woolly underneath. *Flowers* purple, or white, large, terminal, ſolitary, erect; peduncle leafy; calyx globular, or ſomewhat depreſſed; ſcales linear, numerous, ſpreading, beautifully cobwebbed, tipped with a leafy appendage, coloured, ciliated, ſmooth, mucronate-ſpinous; down feathery, deciduous. A native of England and moſt parts of Europe, on a calcareous ſoil. 86. C. *ferox*, Lam. 30. (Cnicus ferox; Linn. Mart. 109. Mart. 3. Willd. 11. Cn. lanceolatus validiſſimis aculeis, Tourn. Inſt. 450. Carduus tomentoſus. Lobel. ic. 2. p. 11.) "Leaves ſeſſile, pinnatifid; pinnules lanceolate, diſtant; flowers large; bractes linear, very ſpinous." La Marck obſerves that this plant is ſo far from being of a different genus from the preceding, as Linnæus makes it, that it is ſcarcely a diſtinct ſpecies. *Root* biennial. *Stem* not ſo high as that of C. eriophorus. *Leaves* ſeſſile, or a little embracing the ſtem, not decurrent as repreſented by Linnæus, greeniſh, and rough with numerous ſpines above, a little cottony, and whitiſh underneath. *Flowers* large, purple; bractes ending in a ſtrong ſpine, rough at their edges and over their whole ſurface, with a great number of very ſharp ſpines. A native of the ſouth of France. 87. C. *ſpinoſiſſimus*, (Carduus comoſus, Lam. 31. Cnicus ſpinoſiſſimus, Linn. Sp. Pl. 3. Mart. 6. Willd. 48. Carlina polycephalos alba, Bauh. pin. 380. Cirſium, Hall. helv. n. 172. tab. 5. Cirſium ſpinoſum, Gmel. Sib. 2. p. 64. tab. 25.) "Leaves embracing the ſtem, lanceolate, pinnatifid, ſpinous; ſtem ſimple; flowers ſeſſile, cluſtered at the top among numerous leaves." β. "Heads of flowers naked, without ſpines." *Stem* a foot and half high, furrowed. *Leaves* near the flowers cloſe ſet, pubeſcent, yellowiſh, with long ſharp ſpines. *Flowers* yellowiſh white: calyx-ſcales ſmooth, ending in a long ſpine. A native of the Alps. If β be not, as Haller thinks it, a diſtinct ſpecies, it is a very remarkable variety, Lam. 88. C. *echinocephalus*. (Cnicus echinocephalus; Willd. 49.) "Leaves ſeſſile, rigid, deeply pinnatifid, downy underneath; pinnules linear, ſpinous at the tip; calyxes globular, ſmooth; ſcales lanceolate, ſpinous, ſpreading." *Root* perennial. *Stem* from four to ſix inches high, ſimple, erect, downy. *Leaves* alternate, crowded; pinnules entire, diſtant. *Flowers* ſolitary, terminal, or on ſhort branches from the axils of the upper leaves; calyx-ſcales purple. A native of Tauria. De Boeher. 89. C. *acaulis*, Linn. Sp. Pl. 26. Mart. 38. Lam. 49. Eng. bot. 161. (Cnicus acaulis, Willd. 40.) Dwarf thiſtle. "Stemleſs; calyx ſmooth." *Root* perennial, woody, blackiſh. *Leaves* depreſſed, ſpreading in a radiate manner, and covering a ſpace often not leſs than a foot in diameter, petioled, ſmooth, pinnatifid; pinnules ſomewhat palmated, ſpinous. *Flowers* purple, large, generally ſolitary, almoſt ſeſſile;

calyx egg-ſhaped; ſcales lanceolate, ſcarcely keeled; ſomewhat ciliated at the tip, ſlightly ſpinous. A native of gravelly and chalky paſtures in many parts of Europe, not a general Engliſh plant, but abundant in Norfolk, where it is the peſt of the ſheep downs. When cultivated in a garden, and ſometimes when wild on a rich ſoil, a ſtem is produced bearing ſeveral flowers; it is then the C. dubius of ſeveral German botaniſts. 90. C. *inermis*, (Cnicus inermis, Willd. 22.) "Leaves ſeſſile, lanceolate, gaſhed, toothed, downy underneath; root leaves pinnatifid; calyx-ſcales egg-lanceolate, membranous at the edge, preſſed cloſe." *Root* perennial. *Stem* furrowed, green, ſlightly villous. *Root-leaves* a foot long, or more, deeply pinnatifid, toothed; lower ſtem-leaves five or ſix inches long, attenuated at the baſe, acuminate at the tip, pinnatifid in the middle; upper ones undivided, attenuated both ways, toothed. *Flower* ſolitary, terminal, very large; calyx-ſcales, as well as the whole plant, without ſpines. Native country unknown. 91. C. *pinnatifidus*, Cavan. ic. 1. p. 58. tab. 83. (Cnicus pinnatifidus, Willd. 47.) "Leaves petioled, oblong, pinnatifid, toothed, woolly; calyx cylindrical, terminal, ſcales preſſed cloſe, oblong, cartilaginouſly mucronate; tips ſpreading." *Root* annual. *Stem* four or five inches high, ſimple, erect, downy. *Leaves* egg-ſhaped, ſomewhat lyrate, without ſpines, cloathed on both ſides with a fine wool; midrib and veins downy. *Flower* ſolitary. A native of Spain. 92. C. *centauroides*, (Cnicus centauroides, Linn. Sp. Pl. 5. Mart. 7. Willd. 50. Centaurium majus, foliis cinaræ cornuti; Moriſ. hiſt. 3. p. 131. tab. 25. fig. 2.) "Leaves pinnatifid; calyxes ſcarious; ſcales acuminate." *Root* perennial. *Leaves* without ſpines. A native of the Pyrenees and of Siberia; Georg. it. 1. p. 229. 93. C. *uniflorus*, (Cnicus, Linn. Mant. 572. Mart. 8. Willd. 51. Centaurea calycibus membranaceis. Gmel. Sib. 2. p. 86. tab. 38.) *Root* perennial. *Stem* two feet high, erect, ſomewhat angular, ſcarcely woolly, one-flowered. *Leaves* numerous, ſeſſile, without ſpines; greyiſh; pinnules alternate; upper leaves ſmaller, more nearly entire; root leaves petioled; ſegments lanceolate, ſerrated. *Flower* violet, terminal, ſeſſile; calyx large, globular; ſcales looſe, egg-ſhaped, villous, grey; florets ſix-cleft; ſegments linear, acute; ſtamens white, longer than the corolla; ſtyle longer than the ſtamens, thread-ſhaped, violet. Willd. A native of Siberia. 94. C. *carthamoides*, (Cnicus carthamoides, Willd. 52.) "Leaves without ſpines, ſeſſile, oblong, toothed; root-leaves ſome undivided, others pinnatifid; calyx ſcarious, villous." *Root* perennial. *Stem* erect, round, thick, ſtriated. *Flower* purple, large, terminal, ſolitary; calyx-ſcales roundiſh-egg-ſhaped. Willd. A native of Siberia. 95. C. *cernuus*, (C. cernuus, Linn. Sp. Pl. 6. Willd. 53. Mart. 9. Carduus, Gmel. ſib. 2. p. 47. tab. 19.) "Leaves embracing the ſtem, egg-ſhaped, toothed; root-leaves heart-ſhaped; petioles winged, ſpinous-toothed; calyx ſcarious, generally ſolitary, drooping, terminal; root perennial. A native of Siberia. 96. C. *mollis*, Linn. Sp. Pl. 25. Mart. 37. Willd. 36. (C. mollior 1. Cluſ. hiſt. 2. p. 151. C. foliis decuſſivè interruptèque pinnatis; Gouan illuſt. p. 63. Cirſium, Jacq. vind. 276. auſt. tab. 18. Scop. Carn. 4. 1000.) "Leaves pinnatifid, linear, revolute at the edges, downy; ſtem nearly naked, one-flowered; calyx-ſcales downy, egg-lanceolate, ſquarrous," Willd. *Root* perennial. A native of Auſtria, and the ſouth of France. La Marck aſſerts that the plants of Cluſius and of Gouan are perfectly diſtinct, and that both of them are ſtrictly ſpecies of Serratula. We have our doubts whether our ſix preceding ones do not properly belong to that genus, their calyx-ſcales not appearing truly ſpinous in the moſt lax ſenſe of the term; but as Willdenow has placed them under his Cnicus, of which a ſpinous calyx-ſcale enters into the eſſential character, we have not thought fit to remove them. In the membranous, cartilaginous, or ſquarrous edgings and terminations of their calyx-ſcales, they may be thought to approach thoſe ſpecies of Carthamus which have leafy appendages to thoſe ſcales. This is ſtill more the caſe with C. eriophorus. But as a compound ſpine, or more than one to each ſcale, forms the eſſential generic character of Carthamus, as La Marck has determined it, they cannot be placed under that genus. La Marck's diſtinction, indeed, is altogether artificial; and it would perhaps be more conducive to ſcientific accuracy and perſpicuity if Carthamus as well as Cnicus were incorporated with Carduus. The genus would not be much larger; and it might eaſily be divided into well-defined ſections, if we had thought that the form of our work authorizes us to innovate ſuch a change, and have relieved us from the neceſſity, to which we have reluctantly ſubmitted, of no longer calling the well known marianus a carduus. But all the liberty that we allow ourſelves is to exerciſe our own judgment when authors differ, and to follow thoſe who appear to us to have moſt cloſely followed the ſteps of nature.

Of the propagation and culture of plants of this genus, little is to be ſaid. In their wild ſtate, the Author of nature has made abundant proviſion for their increaſe, by annexing to their ſeeds a light, and often feathery down, which makes them readily float in the air, and ſcatters them far and wide over all the neighbouring fields. As they are uſually conſidered rather in the light of noxious weeds than of ornamental plants, few of them are admitted into the flower garden or greenhouſe; and thoſe few are valued more for their rarity than for their beauty. Some of them, however, if it were not for the general prejudice againſt them, might with advantage be ſparingly introduced into the borders of the pleaſure ground. Of the native Engliſh ſpecies, the eriophorus, the heterophyllus, and the nutans are the moſt ſtriking. The firſt two have the additional recommendation of being not common; and we ſhould ſuppoſe that every one who ſpends any part of the ſummer months at Buxton, muſt think the cloſe ranks of the laſt which line the ſides of all the ſtone walls, a real ornament to that naked country.

By the farmer the whole tribe is held in abhorrence, and marked for deſtruction. The annual and biennial kinds are eaſily got rid of by cutting them down with a weeding hook in corn fields, and mowing them in paſtures before they ripen their ſeeds. But thoſe that are perennial can be extirpated only by plowing the fields, and carefully gathering the roots. Of theſe, the moſt tormenting to the Engliſh farmer is the arvenſis, which on account of its creeping root that ſtrikes deep into the ground, has been called by Curtis the curſed thiſtle. Thiſtles in general, it cannot be denied, make part of the curſe pronounced upon the ground at the original fall of man from his native innocence. "*Curſed is the ground for thy ſake: thorns and thiſtles ſhall it bring forth to thee: in the ſweat of thy face thou ſhalt eat bread, till thou return unto the ground.*" In what manner the human race would have lived if they had never ſinned, we are not able to determine; and as we have no experience to aſſiſt us in our inquiries, it would be folly to attempt to gueſs. But of this we are certain, that with their preſent feelings and habits, they cannot attain even to a moderate degree of happineſs unleſs they engage in ſome kind of uſeful labour. A bleſſing has, therefore, been graciouſly intermingled with the curſe. To fallen man it is an advantage, for which he ought to be highly thankful, that he is obliged to cultivate the earth for the comfortable ſupport of his life, and that no part of the produce of the ground is ſpontaneouſly raiſed to that ſtate of excellence which is moſt conducive to his enjoyment.

Let no one then preſume to aſſert that thiſtles are made in vain, even though it ſhould be allowed that they have no other uſe than to preſerve a conſiderable part of mankind, either from the intolerable liſtleſſneſs of doing nothing, or from the painful conſciouſneſs of having done miſchief. On this ſuppoſition they are not without a final cauſe, in which the wiſdom and the goodneſs of the adorable Creator are equally conſpicuous.

But in the works of God there is always a manifold uſe. Linnæus has obſerved, that the carduus lanceolatus protects by its ſpines the annual plants which have ſown themſelves in its neighbourhood, and gives them an opportunity of maturing their ſeeds without diſturbance. Dr. Withering adds, that if a heap of clay be thrown up, nothing would grow upon it for ſeveral years if the ſeeds of this plant were not wafted to it by the winds, which vegetate and afford ſhelter for other plants, ſo that the whole becomes fertile. The truth of the latter obſervation we are rather inclined to doubt. But ſuppoſing it to have little or no foundation in fact, the pious philoſophical mind will readily perceive other valuable purpoſes in the general economy of nature, to which this deſpiſed and hated race of vegetables are ſubſervient. The ſeeds afford ſuſtenance to ſeveral kinds of birds, which either ſerve to repleniſh our tables, or delight us with the melody of their notes, the beauty of their plumage, and the elegance of their flight. The leaves are eaten by various inſects, which though they do not appear immediately uſeful to man, may, for ought we know, be important links in the great chain of creation, on which the welfare of the whole depends. Or, if they be not either immediately or remotely uſeful to man, who will preſume to think that infinite benevolence may not create diſtinct ranks of beings, merely for the ſake of giving them capacities and means of enjoyment, and of adding to the general maſs of happineſs which is bountifully diffuſed through the univerſe?

Carduus *marianus*, Linn. See Carthamus *marianus*.

Carduus *foliis ſpinoſis ad inſtar juniperi*, Moriſ. See Doypis *ſpinoſa*.

Carduus *braſilianus*, *foliis aloes*, Bauh. pin. See Bromelia *ananas*.

Carduus *acanthus* ſ. *branca urſi*, Bauh. hiſt. See Acanthus *mollis*, or *ſmooth Acanthus*.

Carduus *aquaticus* ſ. *Indorum*, Cammel. luz. See Acanthus *ilicifolius*, or *holly-leaved Acanthus*.

Carduus *perſonata*, Jacq. Auſtr. tab. 348. Willd. 1. 12. See Arctium *perſonata*, where we have deſcribed it. But as its calyx-ſpines, though reflexed, are not hooked, it is properly a carduus.

Carduus *inermis*, Hall. helv. n. 162. Capitalis in vertice congeſtis, ſquamis reflexis, Gmel. Sib. 2. tab. 24. See Arctium *perſonata*.

Carduus *tinctorius*, Scop. Carn. n. 1012. inermis, Hall. helv. n. 163. See Serratula *tinctoria*.

Carduus *inermis*, Gmel. Sib. 2. tab. 20. See Serratula *coronata*.

Carduus *caule ramoſo*, Gmel. Sib. 2. n. 38. tab. 17. See Serratula *centauroides*.

Carduus *pratenſis latifolius*, Bauh. pin. 376. Lob. ic. 2. p. 11. See Carthamus *oleraceus*.

Carduus *cæruleus erectus*, Moriſ. hiſt. 3. tab. 34. fig. 19. See Carthamus *tingitanus*.

Carduus *chamæleon*, Moriſ. hiſt. 3. tab. 33. fig. 17. See Carthamus *corymboſus*.

Carduus *xeranthoides*, Rai Sup. 199. See Xeranthemum *proliferum*.

Carduus *æthiopicus*, Pluk. phyt. 273. See Gorteria *perſonata*.

Carduus *benedictus*, Bauh. pin. 378. Cam. epit. 562. See Centaurea *benedicta*.

Carduus *luſitanicus*, Tourn. inſt. 441. See Centaurea *eriophora*.

Carduus *ſtellatus*, Bauh. hiſt. 3. p. 89. Bauh. pin. 387. Rai Syn. 196. Muricatus, Cluſ. hiſt. 2. p. 7. See Centaurea *calcitrapa*.

Carduus *ſtellatus*, Magn. monſp. See Centaurea *calcitrapoides*.

Carduus *ſtellatus luteus*, Bauh. pin. 387. Rai Syn. 196. Col. ceph. 1. p. 30. tab. 31. See Centaurea *ſolſtitialis*.

Carduus *galactitis*, Bauh. hiſt. 3. p. 54. Tourn. 441. Rai hiſt. 313. tomentoſum capitulo minore, Bauh. pin. 382. See Centaurea *galactitis*.

Carduus *ſphærocephalus*, Bauh. pin. See Echinops.

Carduus *fullonum*, Lob. ic. 2. 17. See Dipsacus *fullonum*

CARDWANG, Cape, in *Geography*, a cape on the N. coaſt of the iſland of Java. S. lat. 5° 55′. E. long. 107° 10′.

CARDY, or Caroy, two ſmall rocks on the eaſtern coaſt of Ireland, about two cables' length E. of Newhaven point, and near a mile north of Balbriggen, in the county of Dublin, which are dry about half ebb. N. lat. 53° 38′. W. long. 6° 11′.

CARDYNUS, in *Ancient Geography*, a mountain of Aſia, near the Tigris, and probably not far from Niſibis.

CARDYTENSES, a people of Aſia, in Syria, inhabiting the ſmall territory called Cyrreſtica, according to Pliny.

CARE′, a place of Spain, between Liminium and Saragoſſa. Anton. Itin.

CAREARA, in *Geography*, a town of Perſia, in the province of Segeſtan; 87 miles S.E. of Kin.

CARECARDAMA, in *Ancient Geography*, a town of India, on this ſide of the Ganges. Ptolemy.

CAREDIVA, in *Geography*, an iſland of the Indian Ocean, on the weſtern ſide of the iſland of Ceylon.

CAREENING, a term, in the *Sea Language*, uſed for the laying of a veſſel on one ſide, to caulk, ſtop up leaks, and refit or trim the other ſide.

The word comes from *cariner*, which ſignifies the ſame, formed of the Latin *carina*, *the keel of a ſhip*.

A ſhip is ſaid to be brought to a *careen*, when the greateſt part of her lading, &c. being taken out, and a pontoon, or another veſſel lower than herſelf, laid by her ſide, ſhe is haled down to it as low as occaſion requires, and there kept, by the weight of ballaſt, ordnance, &c. as well as by ropes, leſt it ſhould ſtrain her maſts too much. This is done with deſign to trim her ſides, or bottom, to caulk her ſeams, or to mend any fault ſhe has under water. Hence, when a ſhip lies on one ſide in ſailing, ſhe is ſaid to *ſail on the careen*.

Ships of war are generally careened every three years.

The *half careen* is when they can only careen half the ſhip, not being able to reach ſo low as the bottom of the keel.

CAREER, or Carier, in the *Manege*, a place incloſed with a barrier, wherein they run the rings.

The word is alſo uſed for the race, or courſe of the horſe itſelf, provided it does not exceed 200 paces.

In the ancient circus, the career was the ſpace which the bigæ, or quadrigæ, were to run at full ſpeed, to gain the prize. See Circus.

Career, in *Falconry*, is a flight or tour of the bird, about 120 yards.

If it mounts more, it is called a *double career;* if leſs, a *ſemi-career*.

CAREK, in *Geography*. See Karek.

CARELIA, a province of Eaſtern Finland, is now the government of *Viborg;* which ſee. This country became a part of Sweden in 1293; in 1338 part of it was ſurrendered to Ruſſia; and in 1721 the greater part of the remainder was given up to the empire.

CAREMA, a town of Piedmont, in the marquiſate of Ivrea; 6 miles N.W. of Ivrea.

CAREMBOULE, a town of the iſland of Madagaſcar, near the ſouth coaſt. S. lat. 25° 20′. W. long. 84° 1′.

CARENAGE Bay, a bay on the weſt coaſt of the iſland of St. Lucia. N. lat. 13° 35′. W. long. 60° 50′.

Carenage *town*. See St. George.

CARENI, in *Ancient Geography*, a people mentioned by Pliny, and placed in the northern part of the iſle of Albion, or in the north-weſtern part of Scotland. They are alſo called *Carini*. They ſeem to have dwelt about Lochbay, on the N.W. coaſt of Roſsſhire. Camden places them in Caithneſs.

Careni, a people of Aſia, towards Perſia; placed by Steph. Byz. between the rivers Cyrus and Euphrates. Procopius ſays that theſe people offered to Coſroes money to avoid being pillaged; but that he refuſed it, becauſe they were not Chriſtians.

CARENNAC, in *Geography*, a town of France, in the department of the Lot and Garonne, ſeated on the Dordogne; 2½ leagues N.W. of St. Céré.

CARENTAN, a town of France, in the department of the Channel, and chief place of a canton in the diſtrict of St. Lô, ſituate in a marſhy ſoil, which makes the air inſalubrious. It has a port for ſmall veſſels; its principal commerce conſiſts of butter and cattle. The place contains 2857, and the canton 11,951 inhabitants; the territory comprehends 182½ kiliometres and 15 communes. N. lat. 49° 18′. W. long. 1° 21′ 50″.

CARENTIA, or Garentia, in *Ancient Geography*, a town of Italy, belonging to the Libici, placed by Cluvier towards the confluence of the Seſſites and the Padus.

CARENTOIR, in *Geography*, a town of France, in the department of Morbihan, and chief place of a canton in the diſtrict of Vannes; the place contains 5310, and the canton 11,249 inhabitants; the territory includes 200 kiliometres and 7 communes.

CARENTOMAGUS, in *Ancient Geography*, a place of Gaul, in Aquitania Prima, E. of Divona (Cahors), and W. of Segodunum (Rhodes).

CARENUVE, in *Geography*, a town of the iſland of Ceylon; 54 miles N.W. of Trincomaly.

CAREOTÆ, in *Ancient Geography*, a people of European Sarmatia. Ptolemy.

CAREPULA, a town of Africa, placed by Ptolemy in Mauritania Cæſarienſis.

CARERA, in *Geography*, a ſmall trading place between Caliture on the coaſt of Coromandel, and Montipoli, or Great Poli, 31 leagues N. and N.E. by N. from it.

CARES, in *Ancient Geography*, a town of Spain, in the territory called Tarragonenſis. Pliny.

Cares, or Kares, in *Geography*, a town of European Turkey, ſeated on mount Athos, in an elevated and pleaſant ſituation; it has ſeveral convents, and a market every Saturday, for corn and other proviſions; 17 miles S.E. of Salonki.

CARESAN, or Caſſen, a ſea port town of *Arabia* Felix, ſeated on the Indian Ocean, 100 leagues N.E. from Aden. N. lat. 16° 5′. E. long. 52° 7′.

CARESENA, or Caresenia, in *Ancient Geography*, a country of Aſia, extending along the river Careſus, and bounded by Dardania, according to Strabo, who ſays that it is a mountainous, cultivated, and well peopled country, and that it derives its name from the river; which has its ſource at Malonte, a place ſituate between Palæicepſis and Achæium, over againſt Tenedos, and diſcharges itſelf into the *Æſepus*.

CARESTINI, Giovanni, in *Biography*, one of the greateſt ſingers and actors that Italy ever produced, ſince the invention of the muſical drama or opera. He arrived in England in the year 1733, when Handel firſt began his regency in the Haymarket at his own peril, after the Royal Academy of Muſic was diſſolved, and the nobility and gentry had engaged a band of vocal and inſtrumental performers to oppoſe him. This ſeparation, which was occaſioned by a quarrel between Handel and Seneſino, divided the muſical part of the nation into two factions, which gained nothing by the conflict but the gratification of ruining each other. The powerful opponents with whom Handel had to contend hired the theatre in Lincoln's-inn Fields of Rich, the patentee, and engaged Seneſino and Cuzzoni for principal ſingers, and Porpora to compoſe.

*Careſtini* was born at Filatrana, in the march of Ancona, and at 12 years old went to Milan, where he was patroniſed by the Cuſani family, whence he was frequently called *Cuſanino*. His voice was at firſt a powerful and clear ſoprano, which afterwards changed into the fulleſt, fineſt, and deepeſt counter-tenor that has perhaps ever been heard. His firſt appearance on the ſtage ſeems to have been at Rome, in the female character of Coſtanza, in Bononcini's opera of Griſelda, 1721. In 1723 he was at Prague, during the great muſical congreſs there, on occaſion of the coronation of the emperor Charles VI. as king of Bohemia. In 1724 we trace him at Mantua; and in 1726 at Venice, where he performed with Farinelli, and the famous tenor Paita. In 1728 he was at Rome, and again in 1730, where he performed in Vinci's celebrated operas of *Aleſſandro nell' Indie* and *Artaſerſe*, both written by Metaſtaſio. He was now engaged by Handel to ſupply the place of Seneſino, who, together with his whole troop, except the Strada, had deſerted from him, and enliſted under the banners of Porpora and the Barons, at Lincoln's-inn Fields. Careſtini's perſon was tall, beautiful, and majeſtic. He was a very animated and intelligent actor, and having a conſiderable portion of enthuſiaſm in his compoſition, with a lively and inventive imagination, he rendered every thing he ſung intereſting, by good taſte, energy, and judicious embelliſhments. He manifeſted great agility in the execution of difficult diviſions from the cheſt in a moſt articulate and admirable manner. It was the opinion of Haſſe, as well as of many other eminent profeſſors, that whoever had not heard Careſtini was unacquainted with the moſt perfect ſtyle of ſinging. He continued in the higheſt reputation for twenty years after quitting England, and ſung at Berlin with the *Aſtrua* in 1750, 1754, and 1755. This admirable performer was here but two ſeaſons, when he had the Strada as firſt woman for his partner. He performed in Handel's two beſt operas, *Ariadne* and *Alcina*, the firſt year againſt Seneſino and Cuzzoni, who were joined; the ſecond year againſt Farinelli. But ſeveral excellent judges, who had frequently heard him, and with whom we converſed many years after his departure, never ſpoke of his grand ſtyle of ſinging, fine figure, and dignified action, without rapture; among theſe, Haſſe, who had often compoſed for him, and Quantz, who heard him at every period of his fame, were his greateſt panegyriſts.

CARESUS, in *Ancient Geography*, a town of Aſia, in the country called Careſena. It was ſeparated from the Granicus to the north-weſt by a ſmall chain of mountains. Strabo.

CARET, in *Geography*, a town of Germany, in the Tyroleſe; 12 miles S.W. of Bolzano.

Caret, a ſmall bay in the gulf of Darien, which has two iſlands before it that are moderately high, and covered with trees.

Caret, in *Grammar*, a character in this form (ʌ) denoting that there is ſomething inſerted or interlined, which ſhould regularly have come in where the character is placed. This mark is alſo called a circumflex, when placed over ſome vowel of a word, to denote a long ſyllable; as "Euphrâtes."

Caret, in *Zoology*, ſynonymous with Caretta, which ſee.

CARETTA, in *Geography*, a ſmall low iſland, about ¼ of a league from the main, lying on the coaſt of Peru, in the Southern Pacific Ocean, 3 leagues from the cape of Cangallan, or St. Gallan.

Caretta, in *Zoology*. See Testudo *caretta*. Caretta is ſometimes applied to the ſpecies *Teſtudo imbricata*, Knorr, &c.

Caretta, in *Botany*, Rheed. Mal. ii. tab. 22. See Guillandina *bonducella*.

CAREW, George, in *Biography*, earl of Totneſs, the deſcendant of an ancient family in the weſt of England, which came over probably from France with William the Conqueror, and originally derived this name from Carew-caſtle, in Pembrokeſhire, was born in 1557. At the age of 15 he was admitted a gentleman commoner in the univerſity of Oxford, where he made a good proficiency in learning, particularly in the ſtudy of antiquities; but being inclined to a military life, he went to Ireland, and ſerved againſt the earl of Deſmond. Having ſucceſſively occupied ſeveral important poſts, and commanded abroad in the expedition againſt Cadiz, in 1596, he was appointed preſident of Munſter, in 1599, and in the following year treaſurer of the army, and one of the lords-juſtices of Ireland. When he was advanced to the office of governor, he found the country in a ſtate of open rebellion; and yet by his prudence and valour he ſucceeded, with a ſmall force, in reducing it to the queen's obedience, and in counteracting the hoſtile deſigns of the Spaniards, who landed at Kinſal, in 1601. Having ſettled the province in a firm and univerſal peace, he obtained permiſſion to reſign his office in the beginning of the year 1603, and arrived in England three days before queen Elizabeth's death. Upon the acceſſion of king James he was particularly noticed, and advanced to ſeveral poſts of honour, and, in 1605, created a baron, by the title of lord Carew of Clopton in Warwickſhire, as he had married the daughter and heireſs of William Clopton, eſq. When the crown devolved on Charles I. he was created, in 1625, earl of Totneſs. Having eſtabliſhed the character of a faithful ſubject, a wiſe and valiant commander, an honeſt counſellor, a good ſcholar, and a patron of learning, he cloſed his life at the Savoy, in London, in 1629, and was buried at Stratford-upon-Avon, near Clopton, whence he took his firſt title. After his death his natural ſon, Thomas Stafford, publiſhed, in 1633, a work written under his direction, and entitled "Pacata Hibernia," or The Hiſtory of the Wars in Ireland, particularly within the Province of Munſter, during the Years of his Government, fol. illuſtrated with 17 maps. In the Bodleian library are alſo four large volumes of chronologies, charters, &c. relating to Ireland, which were collected by ſir George Carew: and his materials for writing "The Hiſtory of the Reign of King Henry V." are inſerted in Speed's Chronicle. Biog. Brit.

Carew, Thomas, an Engliſh poet of the 17th century, belonged to the family of the Carews in Glouceſterſhire, which originally deſcended from that of Devonſhire. Having been educated in the univerſity of Oxford, and farther improved himſelf by travelling, he was honourably received at court, and much reſpected for his polite and elegant accompliſhments. Charles I. appointed him gentleman of the privy chamber, and ſewer in ordinary; and by Ben Jonſon, ſir William Davenant, and other poets of that period, his abilities and performances were extravagantly admired and applauded. It redounds, however, much more to his praiſe, that he was intimate in his youth with the great earl of Clarendon, who ſpeaks highly of his amiable qualities, and of his talents for light poetry of the amorous kind, in the elegance and fancy of which he had few equals. From him alſo we learn, that Carew, after paſſing 50 years of his life in a careleſs and licentious manner, died (about the year 1639) with ſentiments of penitential remorſe and unfeigned reſpect for Chriſtianity. He left behind him ſeveral poems, which have been frequently reprinted, and a maſque, entitled, "Cœlum Britannicum." Biog. Brit.

Carew, Richard, was a deſcendant of the Corniſh branch of the Carew family, and born in 1555. After ſpending three years in the univerſity of Oxford, and about the ſame time in the Middle Temple, he travelled into foreign parts: and upon his return ſettled in his native county. The only original work written by him, if we except "The true and ready way to learn the Latin tongue," which is aſcribed to him, was his "Survey of Cornwall," publiſhed in 4to. at London, in 1602. This work, which is much commended by Camden, has been ſince in a great degree ſuperſeded by Dr. Borlaſe's excellent publications relative to the county of Cornwall. Mr. Carew was held in high eſtimation for his talents and learning by ſeveral of the moſt eminent ſcholars of his time; and particularly by ſir Henry Spelman, who extols him for his ingenuity, virtue, and learning. He died in 1620. Biog. Brit.

Carew, George, brother of the preceding, was educated at Oxford, ſtudied the law in the inns of court, and then travelled to foreign countries. On his return, he was called to the bar, and enjoyed ſome poſts of honour and profit. Queen Elizabeth conferred upon him the honour of knighthood; and he was employed at home in treating with the Scotch concerning an union between the two kingdoms, and abroad in foreign embaſſies, firſt to Poland and afterwards to France. During his reſidence in the latter country, he formed an acquaintance with ſeveral literary perſons, and particularly with Thuanus, to whom he communicated hints relating to Poland, which were of uſe to that excellent author in compiling part of his hiſtory. After his return from his French embaſſy in 1609, he drew up, for the uſe of James I., a perſpicuous "Relation of the State of France, with the Characters of Henry IV. and the principal perſons of that Court," which valuable tract was communicated, in MS., by the earl of Hardwicke, to Dr. Birch, who publiſhed it in 1749, at the cloſe of his "Hiſtorical View of the Negociations between the Courts of England, France, and Bruſſels, from the year 1592 to 1617." This intelligent writer commends it as a model upon which ambaſſadors may form and digeſt their notions and repreſentations; and Mr. Gray alſo repreſents it as an excellent performance. From a letter written by Thuanus to Camden, in the ſpring of the year 1613, it appears that he was then lately deceaſed. Biog. Brit.

CAREX, in *Botany*, (derivation uncertain, ſuppoſed by ſome from the Greek verb, *κειρω*, *tondeo*, *abſcindo*, in alluſion to the ſharp edges of the triangular ſtem, and agreeably to the character given of it by Virgil,

"Frondibus hirſutis, et carice paſtus acuta," Georg. iii. 231. Profeſſor Martyn derives it, but, we think, with leſs probability, from *careo*, not *quia viribus careat*, but becauſe, from its roughneſs, it is fit *ad carendum*, to card, teaze, or pull.) Linn. Gen. 1046. Schreb. 1407. Gært. 17. Juſſ. p. 26 Vent. vol. ii. p. 91. Laiche, Lam. Encyc. Claſs and order, *monœcia triandria*. Nat. ord. *calamariæ*, Linn. *Cyperoideæ*, Juſſ.

Gen. Char. *Flowers* diſpoſed in one or more oblong, imbricated catkins; the male and female in ſome ſpecies on the ſame, in others on diſtinct catkins. Male. *Cal.* glume one-valved, one-flowered, lanceolate, acute, concave, permanent. *Cor.* none. *Stam.* filaments three, briſtle-ſhaped, erect, longer than the calyx; anthers erect, long, linear. Female. *Cal.* as in the male. *Cor.* petals none; nectary inflated, oblong-egg-ſhaped, contracted upwards, opening at the tip, ſometimes with two teeth, permanent. *Piſt.* germ three-ſided, within the nectary; ſtyle ſimple; ſtigmas either three or two, awl-ſhaped, incurved, long, acuminate, pubeſcent. *Peric.* none, except the enlarged nectary which protects the ſeed. *Seeds* ſingle, acutely egg-ſhaped, moſt frequently three-ſided, one angle often leſs than the other.

Eſſ. Char. Seed incloſed in the permanent nectary.

An admirable monograph of the Britiſh ſpecies has been publiſhed by the Rev. Dr. Goodenough, in the Tranſactions of the Linnæan Society, of which we have gratefully availed ourſelves. Mr. Wahlenberg, of Upſal, has alſo written an excellent monograph of the genus publiſhed in "Kongl. Vetenſkaps Academiens Nya Handlingar Für Aprilis, Majus Junius, 1803," and republiſhed in the fourth number of the Annals of Botany. We had made our arrangement, and drawn up the article before this work fell into our hands, but have ſince inſerted all his new ſpecies, with ſuch additions to the others as ſeemed important. From him we have alſo borrowed the references to the coloured figures, publiſhed by Mr. Schkuhr of Wittenburg.

Of the earlier modern botaniſts Lonicer appears to be nearly the only one who retained the term carex, and uſed it in its ancient acceptation. It was not employed either by Tournefort or Ray. Tournefort united ſeveral ſpecies under the vague appellation of cyperoides; one or two of which, if rightly underſtood, have both male and female flowers on the ſame ſpike; but his generic character comprehends thoſe only which have them in ſeparate ſpikes. Ray has adopted a ſtill more exceptionable name, gramen cyperoides; and has been juſtly accuſed by Dr. Goodenough of including cyperus under it, and thus "making the thing likened include and refer to itſelf for its original;" but in juſtice to our great countryman it ought to be added, that though, in the introduction to the genus, as it ſtands in his Synopſis, he has, perhaps, inadvertently made cyperus one of the diviſions of his gramen cyperoides, in the ſubſequent nomenclature of ſpecies he has carefully kept them diſtinct. We may obſerve, by the way, that this impropriety is of frequent occurrence in the writings of Juſſieu and other French botaniſts.

About the beginning of the laſt century, Micheli and ſome others applied the term carex to thoſe ſpecies, which have male and female flowers on the ſame ſpike, calling the others, either cyperoides or ſcirpoides. Linnæus extended it to both, and formed the preceding generic character, to which, as to its ſubſtance, all ſubſequent authors have acceded. Dr. Goodenough, indeed, doubts whether the two families may not be advantageouſly again divided; but with due deference to this excellent naturaliſt, whoſe name muſt always carry with it a great weight of authority, as Linnæus's generic character is clear and definite, and eſpecially as the two families ſometimes run a little one into the other, it is ſurely more conducive to ſcientific preciſion to keep them together; and the caſe of the inveſtigating ſtudent is quite as well conſulted, by making them ſubdiviſions of one large genus.

A great diverſity of opinions has prevailed with reſpect to the proper appellation of that part, which Linnæus has called the nectary. Tournefort calls it a veſicle, which afterwards becomes a capſule. Ray does not appear to have noticed it. Linnæus himſelf, when he ſpeaks of it in an advanced ſtate, ſometimes calls it a tunic; but more generally, though in defiance of his own definition, a capſule. Gærtner, in the firſt volume of his great work, "de fructibus et ſeminibus plantarum," calls it a coriaceous nut, formed of the indurated corolla, obſerving that it is not a true pericarp, but a mere involucre of the ſeed, ſince it permits the piſtil to paſs freely through it, which is contrary to the nature of a pericarp. If this eminent carpologiſt had lived to publiſh a ſecond edition of his work, he would probably have called it an angidion. See the preface to the ſecond volume, p. 32. La Marck, regarding only the form, calls it, not unaptly, though not very ſcientifically, an urceole. Dr. Smith, in ſeveral parts of his Engliſh botany, had expreſſed an inclination to conſider this puzzling appendage to a very ſimple flower, as a true permanent corolla, which gradually hardens, and finally becomes an envelope of the ripened ſeed; but afterwards, in conſequence of ſuggeſtion from Dr. Goodenough, ſupported by his own deliberate judgment, was induced to call it an aril, "as a name much better expreſſing its true nature than the hypothetical one of nectary, the erroneous one of capſule, or even the analogical denomination of corolla." As ſuch it is deſcribed in his Flora Britannica. See alſo the fifth volume of the Tranſactions of the Linnæan Society, p. 265. It may be proper to add, that in the third volume of the ſame Tranſactions there is a paper by Dr. Goodenough, in which he intimates a belief, that all carices diſpoſe of their ſeeds by the opening of the point of what he there calls the capſule; and as this opening is obſerved in ſome very early, and in others not till they are quite old, in the former caſe it has been deſcribed as opening, and in the latter as quite cloſed. In a very recent number of the Engliſh botany, Dr. Smith ſtill continues to call it a tunic, a term which as it leaves the matter *adhuc ſub judice*, we ſhall employ in the following deſcriptions, in all caſes where we do not uſe the more general term, fruit.

In dividing the genus into ſections, Linnæus ſeparated thoſe which have ſeſſile from thoſe which have peduncled female ſpikes. Dr. Goodenough obſerves, that this has been a ſource of great perplexity; for cultivation, or in a natural ſtate a luxurious growth, does away the whole diſtinction. The peduncle, moreover, is often or in a great degree concealed by the ſheath of the foliaceous bracte. Thus C. diſtans always has its ſpikes on long peduncles, but as they are embraced by the ſheaths, Linnæus ſtiled them nearly ſeſſile. Dr. Goodenough has therefore propoſed a new mark of diſtinction, founded on the proportion which the peduncle bears to the ſheath, and which is the ſame under every variation of ſoil and cultivation. If the ſheath be of the ſame length as the peduncle, he calls it *vagina æquans*; if half the length, *dimidiata*; if about a quarter, *abbreviata*.

Species. * *Spike ſingle, ſimple.*

1. C. *dioica*, Linn. Sp. Pl. Mart. 1. Lam. 1. Wahlen. 1. Eng. bot. tab. 543. Flor. dan. 369. Schkuhr 1. tab. A. Q. W. fig. 1. 2. (C. lævis; Hoppe. Maſc. Gramen cyperoides, ſpicâ ſimplice caſſa; Rai Syn. Ed. 2. 267. Gramen cyper. minimum ſpicâ caſſâ ſimp. Inorie. §. 8. tab. 12. fig. 22. Fæm. Gram. cyper. ranunculi capitulo rotundo; Rai Syn. 425. Cyperoides, Mich. gen. 56. tab. 32. f. 2. β. Gram. Cyp. capitulo longiore; Rai Syn. 425.) "Spike ſimple, dioicous; fruit egg-ſhaped, ribbed, aſcending, finely ſerrated at the edges." *Root* perennial, creeping. *Stems* from four to ten inches high, ſimple, triangular, ſmooth, leafy below. *Leaves* briſtle-ſhaped, ſomewhat triangular, channelled within, a little ſhorter than the ſtem, ſheathing. *Spikes* ſcarcely an inch long, linear, erect, many-flowered; glumes with a greeniſh nerve at the back, membranous at the edge, thoſe of the female ſpike broader; ſtamens capillary, exſerted; anthers yellow, linear. *Fruit* egg-ſhaped, gibbous and ribbed on the outſide, finely ſerrated near the tip, membranous and entire at the orifice, finally a little ſpreading; ſtigmas two, linear, pubeſcent. *Seeds* lenticular, ſmooth, yellowiſh, ſomewhat beaked. We have ſpecimens of var. β. gathered near Leeds with a ſingle female flower at the bottom of the male ſpike. A native of wet, ſpongy meadows in England, France, and other parts of Europe, flowering in May and June. 2. C. *Davalliana.* Smith in Tranſactions of the Linnæan Society, vol. v. p. 266. Flor. Brit. n. 2. Schkuhr tab. A. fig. 2. (C. dioica. Willd. Car. Berol. 16. C. dioica. β. Wahlen. C. n. 1350. Hall. Hiſt. v. 2. 182. Gramen cyperoides, ſpica ſimplici caſſâ; Scheuch. Agr. 497. tab. 11. f. 9. 10. excluding all the ſynonyms.) "Spike ſimple, dioicous; fruit triangular-lanceolate, ribbed, ſpreading, deflexed; angles near the tip rough." *Root* perennial, fibrous, forming a turf. *Stems* a little higher than thoſe of C. dioica, ſimple, triangular, rough, leafy at the baſe. *Leaves* briſtle-ſhaped, triangular, three times ſhorter than the ſtem. *Spike* linear, upright, many-flowered; glumes brown, keeled, acute, membranous at the edge; ſtamens as in C. dioica. *Fruit* lanceolate-triangular, not egg-ſhaped, not gibbous, beaked, more ſtrongly ribbed, and on both ſides, rough near the tip at the angles, membranous and entire at the orifice, finally ſpreading in a deflexed direction, acuminate, ſo as to render the ſpike ſquarrous; ſtigmas two. Sent to Dr. Smith and Dr. Goodenough from Switzerland by Mr. Davall; diſcovered in Mearnſhire by profeſſor James Beattie jun. of Aberdeen, and on Lanſdown-hill near Bath by Mr. Grouet and Mr. Lambert. 3. C. *capitata,* Linn. Sp. Pl. 2. Mart. 2. Lam. 2. Flor. dan. 372. Wahlen. 2. Schkuhr 2. tab. Y. fig. 80. "Spike ſimple, egg-ſhaped, bearing both male and female flowers, the male ones above; fruit neither ſerrated nor rough at the edges, ſcarcely nerved, imbricated, ſpreading." *Root* perennial. *Glumes* ſcarcely green at the back. Linn. "Spike ſomewhat globular; male flowers at the top; ſtigmas two; fruit circinate-ovate, a little convex on one ſide, flat on the other, quite ſmooth and even, ſlender, obtuſe at the edges; leaves filiform." Wahlen. A native of Lapland, but not of Great Britain, as Linnæus ſuppoſed. 4. C. *leptalea,* Wahlen. 3. (C. polytrichoides; Willd. MSS.) "Spike with few and rather ſcattered flowers; ſtigmas two; fruit oblong-elliptical, emarginate; leaves very narrow." A native of North America. 5. C. *pulicaris,* Linn. Sp. Pl. 3. Mart. 3. Lam. 3. Leers tab. 14. fig. 1. Flor. dan. 166. Eng. bot. 1051. Schkuhr 3. tab. A. fig. 3. (C. pſyllophora; Linn. jun. Supp. 413. Ehrt. Phyt. n. 7.; Wahlen. 4. C. minima, capſulis deorſum deflexis; Mich. gen. 65. tab. 33. fig. 1.) "Spike ſimple, with both male and female flowers; upper ones male; fruit divaricated, reflexed, tapering at both ends; ſtigmas two." *Root* perennial, fibrous, not creeping as in C. dioica. *Stems* often a foot high, ſimple, ſlender, ſmooth, leafy near the baſe. *Leaves* briſtle-ſhaped, in tufts, rigid, ſmooth, channelled, nerved, nearly as long as the ſtems. *Spike* linear, erect, at firſt reſembling that of C. dioica, in which ſtate it is figured in Flora danica. *Male flowers,* numerous; glumes brown, finally preſſed cloſe; *female* looſely imbricated, finally reflexed; glumes deciduous, being forced off by the bending back of the ripening germ. *Fruit* elliptical-lanceolate, ſharp-edged on each ſide, ſlightly cloven at the tip, without ribs, of a poliſhed brown colour, ſomewhat reſembling that of a flea, whence the trivial name; ſtigmas two. *Seed* elliptical brown. A native of marſhy ground in England and other parts of Europe, flowering in June. 6. C. *obtuſata,* Wahlen. 5. Liljeblad Act. Stockh. 1793, tab. 4. "Spike of about four flowers; ſtigmas three; fruit inverſely egg-ſhaped, inclining to globular, ſomewhat coriaceous, patent-diverging; orifice tranſparent, two-lobed; leaves very narrow." A native of Sweden in dry gravelly ſoil. 7. C. *petræa,* Wahlen. 6. "Spike with numerous male flowers at the top, three ſcattered female ones at the baſe; ſtigmas three; glumes ſomewhat circinate, large, very brittle; fruit top-ſhaped, very ſlender, erect; ſtem acutely angular. A native of rocky mountains in the north of Lapland. 8. C. *pyrenaica,* Wahlen. 7. "Spike many-flowered, denſe; female flowers numerous; ſtigmas three; fruit narrow-oblong, with a ſhort beak, diverging." A native of the Pyrenées. 9. C. *pauciflora,* Mart. 45. Lightfoot Flor. Scot. tab. 6. fig. 2. Smith Flor. Brit. n. 4. Schkuhr 4. tab. A. fig. 4. (C. patula; Hudſ. 402 and 657. C. leucoglochin; Linn. jun. Supp. 413. Ehrt. Phyt. n. 8. Mart. 52. Wahlen. 8.) "Spike ſimple, with few flowers; fruit ſpreading, awl-ſhaped; ſtigmas three." *Root* perennial, creeping. *Stems* from three to five inches high, aſcending, ſmooth, obſcurely triangular. *Leaves* generally two, even, channelled, about half the length of the ſtem. *Spike* looſe; flowers from four to ſix; terminal; one of them male, erect; the reſt female, ſpreading, finally bent down. *Fruit* ſomewhat triangular, furrowed; ſtigmas three. According to Lightfoot there are ſometimes only two. A rather rare native of alpine marſhes in Scotland, flowering in June. In the north of Sweden common. 10. C. *ſquarroſa,* Linn. Sp. Pl. 4. Mart. 4. Lam. 4. "Spike ſimple, with male and female flowers, cylindrical; lower flowers male; fruit imbricated, horizontal." *Spike* thick. *Fruit* with a long linear beak. One of the largeſt ſpecies in the genus. Linn. A native of Canada, Kalm. 11. C. *hamata,* Mart. 46. Wahlen. 10. Swartz. Prod. 18. (C. uncinata; Schkuhr 7. tab. G. fig. 30. C. phleoides; Cavanilles Icon. vol. 5. p. 40. tab. 464. fig. 1.) "Spike rather long, male flowers at the top; ſtigmas three; glumes oval, as long as the fruit, obvolute; fruit oblong, obtuſe, convex on one ſide, a little concave on the other, ciliated, with a long and hooked awn." Wahlen. A native of mountains in Jamaica; Swartz. Chili, Cav. Iſle of France. Grondal. 12. C. *uncinata,* Linn. jun. Sup. Mart. 5. and 53. Lam. 6. Wahlen. 11. "Spike very long, thickened above; male flowers at the top, ſtigmas three; glumes adnate, oblong, ſhortiſh; fruit oblong, with a ſhort and roundiſh beak, and a rather long, hooked awn." Wahlen. The moſt beautiful ſpecies in the genus. *Female flowers* occupying two thirds of the ſpike; awn curved above the middle, thickened at the joint. Small ſpikelets ſometimes hang down at the ſide, which are perhaps barren. Linn. jun. A native of New Zealand. Forſt. 13. C. *erinacea,*

*nacea*, Wahlen. 12. Cavanilles Icon. vol. 5. p. 40. tab. 464. fig. 2. "Spike linear, ſhortiſh; male flowers at the top, ſtigmas three; glumes ſomewhat circinate, rather large; fruit roundiſh-egg-ſhaped, triangular; awn very long, hooked. A native of the weſt coaſt of ſouth America. 14. C. *rupeſtris*, Mart. 47. Allion. Pedem. 2292. tab. 92. fig. 1. "Spike oblong, male flowers at the top; female glumes awned." *Stem* ſcarcely four inches high, naked, triangular, twice as long as the leaves. *Spike* an inch long; male glumes ſomewhat egg-ſhaped, not awned; female broad, egg-ſhaped, acute, bay-coloured, with a paler edge, and a broadiſh nerve ending in an awn. A native of Piedmont.

** *Spike compound. Male and female flowers on the ſame ſpikelet.*

15. C. *Bellardi*, Mart. 48. Wahlen. 15. Allion. Ped. 2293. tab. 92. fig. 2. Schkuhr 25. tab. D and H h, fig. 17. (C. myoſuroides; Villars Dauph. 2. 194. tab. 6?) "Spike ſomewhat compound, linear; ſpikelets of two flowers, upper one male; lower female, with three ſtigmas; glumes ſomewhat circinate, large, very brittle; fruit top-ſhaped, ſlender; ſtem round; leaves filiform." Wahlen. *Root* fibrous. *Stems* numerous, about ſeven inches high, ſtriated, ſomewhat curved. *Leaves* convoluted, ſtriated, ſomewhat curved, about the height of the ſtem. *Spike* about an inch long; flowers generally ſolitary, alternate, ſeſſile; ſo that the ſpike ſeems to be interrupted; glumes egg-ſhaped, acute, without awns, bay with a whitiſh edge. Allion. A native of Piedmont. Although theſe two authors do not exactly agree in their manner of deſcribing the infloreſcence, the difference ſeems to be only verbal. The myoſuroides of Villars, which he ſuſpects may be the ſame plant, and which he ſays has hermaphrodite flowers and *half naked* ſeeds, muſt be diſtinct, and if his deſcription be exact, is ſcarcely a Carex. 16. C. *capenſis*, Wahlen. 14. Thunb. "Spikelets male at the top, ſomewhat compound, near together; ſtigmas three; fruit oblong, acute, convex on both ſides, obtuſely angular, a little curved outwards, bractes ſomewhat foliaceous, ſtem round. 17. C. *cyperoides*, Linn. jun. Suppl. 413. Mart. 6. and 54. Lam. 5. Wahlen. 33? Schkuhr 28. tab. A. fig. 5? (C. bohemica; Schreb. gram. tab. 28. fig. 3. Mich. gen. p. 70. tab. 33. fig. 19. Cyperus minor, capitulis inflexis; Buxb. Cent. 4. p. 34. tab. 61. Scirpus pica multipartita, feminibus cordatis; Gmel. ſib. v. 1. p. 81.) "Head terminal, roundiſh; flowers abſolutely ſimple, awl-ſhaped, involucre long." *Flowers* abſolutely ſimple, (which is ſingular), pedicelled, forming a ſimple umbel, Linn. jun. La Marck adopts all the younger Linnæus's ſynonyms; but gives the following deſcription, which appears to be taken from Schreber, reſembling Cyperus in its general habit and involucre, and Scirpus in the diſpoſition of its flowers. *Root* perennial. *Stems* about a foot high, triangular, ſheathed in their lower part with a few gramineous, narrow leaves. *Head* round, terminal, compoſed of numerous cloſe ſpikelets. *Flowers* on the outſide of each ſpikelet male, on the inſide female; ſtamens white; piſtil longer than the tunic; ſtyle bifid. *Involucre* four-leaved. Martyn inadvertently gives it twice, with preciſely the ſame ſynonyms to both, but annexes Schreber's deſcription to n. 6. and the younger Linnæus's to n. 54. If they really belong to the ſame ſpecies, Linnæus's plant muſt be a very ſingular variety with one-flowered ſpikelets, for ſuch the pedicel determines them to be: it proves alſo that the ſpecies, whether one or two, ought not to be placed in the firſt ſection. Wahlenberg gives the following ſpecific character of his cyperoides; "ſpikelets male at the baſe, forming a head; glumes linear-briſtle-ſhaped; fruit bicuſpidate; bractes cloſe together, foliaceous, long." A native of Bohemia, the Levant and Siberia. 18. C. *curvula*, Mart. 49, Lam. 10. Wahlen. 16. Hall. helv. n. 1353. Allion. pedem. n. 2295. tab. 92. fig. 3. Schkuhr 25. tab. D and H h, fig. 17. "Stem and leaves rigid, curved; ſpike ſingle; glumes awned." *Root* perennial. *Stems* ſlender, naked, ſcarcely longer than the leaves. *Leaves* narrow, ruſh-like, three or four inches long, a little curved. *Spike* ſhort, apparently ſimple, but compoſed of two or three cluſtered ſpikelets. *Glumes* lanceolate, acute, reddiſh, membranous, and whitiſh at the edges. A native of high mountains in Switzerland, Dauphiny and Piedmont. 19. C. *incurva*, Mart. 57. Lightfoot Flor. Scot. 544. tab. 24. Smith Flor. Brit. 10. Goodenough 9. Wahlen. 19. Schkuhr 19. tab. H h, fig. 25. (C. juncifolia; Allion. pedem. 2296. tab. 92. fig. 4. Flor. Dan. 432?) "Spikelets cluſtered in a head; lower flowers female, bractes membranous; ſtem roundiſh, ſmooth; leaves channelled." Dr. Smith. Very nearly allied to the preceding, if it be more than a variety. *Root* perennial. *Stems* three inches long, aſcending, naked, even, on the ſea-ſhore curved, on moiſt mountains often ſtraight. *Leaves* ſhorter than the ſtem, linear, channelled, even, nerved. *Spike* compound, ſhort, nearly conic when in flower, obtuſe when in ſeed; ſpikelets roundiſh, few-flowered, browniſh. *Bractes* ſhorter than the ſpikelets, partly embracing the ſtem, concave, elliptical, obtuſe, ſlightly keeled. *Glumes* egg-ſhaped, brown, white at the edges, with a very ſlender keel. *Fruit* egg-ſhaped, acute, green, brown at the tip, undivided, ſmooth at the edges. *Stamens* capillary, very long, white. *Stigmas* two, brown. *Seed* lenticular. Lightfoot deſcribes his plant as having no involucre and ſuch it appears in his figure. Dr. Smith attributes to it two bractes which are repreſented very diſtinctly in Mr. Sowerby's figure in Engliſh botany. Dr. Goodenough was honoured with a ſight of Lightfoot's original ſpecimen in her majeſty's herbarium, but fearful of doing any injury by handling it, forebore taking a minute deſcription. We are doubtful of the figure in Flora Danica, though quoted both by Dr. Goodenough and Dr. Smith. It appears to differ not only in habit, but alſo in the ſtructure of the piſtil. If it be our plant it is taken in an advanced ſtate of fructification, and without the bractes. It ſeems probable that the latter may be generally puſhed off by the ripening fruit. Specimens of this plant were ſent to Dr. Hope from the deep, looſe ſand at the mouth of the water of Naver, and from the neighbourhood of Skelberry in Dunroſſneſs in Shetland. Dr. Smith received others from Profeſſor Beattie, gathered near Aberdeen. It flowers in July and Auguſt. 20. C. *fœtida*, Mart. 50. Lam. 7. Wahlen. 20. Allion. Flor. ped. 2297. Hall. helvet. 1355. Scheuch. gram. 495. Prodr. tab. 4. It. p. 458. fig. 11. Villars Dauph. 2. 195. "Spike compound, egg ſhaped, brown; ſpikelets cluſtered." Lam. *Root* perennial. *Stem* naked, triangular, often a little curved, about the length of the largeſt leaves. *Leaves* about three inches long, near two lines broad, tufted, graſs-like, keeled. *Spike* ſhort, a little conical, brown or blackiſh, naked at its baſe; ſpikelets ten or twelve, egg-ſhaped, acute, blunt, forming a regular cluſter. Sometimes there are two long, tailed leaves under the ſpike, ſometimes only one, and ſometimes none. According to Haller the plant has an unpleaſant ſmell, both green and dry. A native of boggy ground on mountains in Switzerland, Dauphiny and Piedmont. La Marck conſiders the juncifolia and fœtida of Allioni as the ſame plant, and quotes C. incurva of Lightfoot as a ſynonym; but Dr. Smith, who gathered both on the hill called Rouche near Mount Cenis, has determined them to be perfectly diſtinct, and the juncifolia to be Lightfoot's incurva, though on the Alps it is ſeldom curved. Wahlenberg, on

the other hand, makes all the three diſtinct ſpecies, and gives the following ſpecific characters of the juncifolia and incurva. 21. C. *juncifolia*, n. 17. "Spikelets ſeſſile, male at the top, collected into a ſmall oblong head; fruit rather roundiſh-depreſſed, attenuated; orifice two-lobed, ſtigmas two; ſtem round, incurved; leaves convolute; inner ones very ſhort." C. *incurva*. n. 19. "Spikelets ſeſſile, male at the top, denſely collected into an ovate-globular head, few, ſomewhat diverging; fruit circinate-ovate, ſemiglobular, beaked; orifice very entire; ſtigmas two; ſtem rather acutely angular, ſomewhat incurved: leaves convolute." 22. C. *ſimpliciuſcula*, Wahlen. 18. (Schœnus monoicus; Eng. bot. 1410?) "Spikelets ſeſſile, male at the top, cluſtered into a linear ſpike; fruit oblong, depreſſed, ſlightly beaked; orifice very entire; ſtigmas two; leaves very narrow, convolute." A native of Weſtmoreland in England, ſent to Swartz by Mr. (doubtleſs Dawſon) Turner. From this circumſtance, added to its not being mentioned by any Britiſh botaniſt, we think it almoſt certain that this plant is no other than Schœnus monoicus of Engliſh botany, which remained for ſome time undetermined, and as Dr. Smith obſerves, was taken by every body, even the able Mr. Schkuhr, for a Carex: but in that caſe Wahlenberg has greatly erred in deſcribing the fructification. 23. C. *ſtenophylla*, Wahlen. 21. (C. juncifolia, Hoſt. Schkuhr. Car. 18. tab. G. and I i. fig. 32). "Spikelets ſeſſile, male at the top, collected into an ovate head; fruit ventricoſe, roundiſh, rather flatly convex, ribbed, ſlightly ſerrated at the edge; orifice two-toothed; ſtigmas two; ſtem acutely angular; leaves very narrow." 24. C. *Baldenſis*, Linn. Sp. 5. Mart. 7. Lam. 9. Wahlen. 13. Vill. Dauph. 2. 196. tab. 6. Schkuhr. tab. 4. fig. 81. (C. alpina ſeg. ver. 1. 125. n. 5. gram. junceum; Bauh. pin. 6. n. 12. prod. 13. tab. 13. Hiſt. 2. 509.) "Spikes egg-ſhaped, triangular, ternate, cluſtered, terminal, ſeſſile; involucre two-leafed." Linn. *Root* perennial. One leaf of the involucre longer than the ſpikes, the other ſhorter. *Spikelets* three or four, collected into a head, white, oblong; glumes of the male flowers on the upper part of the ſpikelets lanceolate; of the female flowers gibbous; ſtyle long, three-cleft. Linn. *Stem* naked, triangular, at leaſt ſeven inches high. *Leaves* all radical, rather narrow, half the length of the ſtem *Spikelets* three, ſeſſile, ſhort, reddiſh brown or whitiſh, forming a kind of three-lobed ſpike. Seguier. A native of Mount Baldo and the neighbourhood of Verona. La Marck thinks it muſt be rare, neither Haller nor Allioni having deſcribed it, and he himſelf having never ſeen it, but conjectures that the following may be a variety of it without the involucre. 25. C. *tripartita*, Mart. 59. Allion. ped. n. 2298. tab. 92. fig. 5. Hall. helv. 1356. (C. lobata; Lam. 8. Wahlen. 23. Vill. Dauph. 2. 197. ?) "Spike compound, egg-ſhaped, ſomewhat lobed, ferruginous-brown; lower glumes mucronate." Lam. *Root* perennial. *Stem* trianlar, naked, a little longer than the largeſt leaves. *Leaves* four or five inches long, two lines broad, tufted, gramineous, keeled. *Spike* ſhort, naked at its baſe, commonly three-lobed; lateral, lobes very ſhort; ſpikelets about twelve, ſeſſile, male at the top, egg-ſhaped, cluſtered; ſtigmas two. A native of Switzerland, Dauphiny, and Piedmont. 26. C. *bipartita*, Mart. 60. Lam. 11. Allion. pedem. 2301. tab. 89. fig. 5. "Stem round, naked; ſpikes two, upper one compound, terminal." *Root* perennial, fibrous, throwing out ſeveral ſtems and leaves in a tuft. *Stems* four or five inches high, twice the length of the leaves, ſtriated, cylindrical. *Leaves* gramineous, ſmooth, a little rolled in at their edges, ſtriated, acute, almoſt pungent. *Spikes* two, upper one an inch long; ſpikelets ſeſſile, alternate, cluſtered; lower one near the other, ſhorter, egg-ſhaped, pedicelled; bracte reddiſh brown, acute; glumes egg-ſhaped, acute, not awned, brown, whitiſh at their edges as they grow old. Sometimes, but rarely there is a third ſpike beneath the other two. A native of ſpongy ground on the mountains of Piedmont. 27. C. *diviſa*, Mart. 56. Goodenough 12. Smith 13. Linn. Soc. Tranſ. vol. ii. tab. 19. fig. 2. Wahlen. 27. Eng. bot. 1096. Schkuhr 11. tab. V v. fig. 61. (C. hybrida; Lam. 17. Gramen cyperoides ex monte Ballen. ſpicá divulſâ; Rai Syn. 423.) "Spike once or twice compounded; bracte leafy, erect; fruit not ſpreading; root creeping." *Root* perennial, creeping horizontally to a conſiderable extent, black, ſtrong, twiſted. *Stems* a foot high and more, upright, weak, naked, trianlar; angles roughiſh upwards. *Leaves* narrow, upright, bright green, rough at the edges and keel, various in length. *Spike* an inch long, egg-ſhaped, often doubly compound at the baſe, of a dark ruſty colour, denſe, rather compreſſed; ſpikelets ſeveral, irregularly cluſtered, egg-ſhaped, acute; female flowers loweſt, moſt numerous, and flowering ſooneſt, which, as Dr. Goodenough obſerves, occaſions a conſiderable elongation of the ſtyles waiting for their impregnation *Bracte* at the baſe of the ſpike leafy, upright, acutely triangular, often very long, but ſometimes ſhorter than the ſpike. *Glumes* elliptical, mucronate, brown, a little membranous at the edge; keel pale. *Fruit* ſhorter than the glume, egg-ſhaped, with a rough dilated margin, cloven at the point; ſtigmas two, brown, very long. A native of marſhy ground, flowering in May and June. 28. C. *muricata*, Linn. Sp. Pl. 11. Mart. 13. Gooden. 13. Smith 14. Wahlen. 28. Schkuhr 13. tab. E. fig. 22. (C. ſpicata; Hudſon With. 2d. Ed. Relh. Lightf. Sibth. C. vulpina β; Lam. C. paluſtris media; Mich. gen. 69. tab. 33. fig. 14. Gram. cyper. ſpicatum minus; Rai Syn. 424. Gram. ſylv. Moriſ. 8. tab. 12. fig. 27. β. G. cyperoides ſpicis minoribus, minuſque compactis; Scheuchz. Ag. 488. tab. 11. f. 5. γ. C. loliacea; Schkuhr 14. tab. E e. fig. 91. Suter. Flor. Helv. 18. capſulis ſubacutangulis.) "Spike oblong, once or twice compounded, prickly; fruit divaricated, pointed, cloven; root fibrous." *Root* perennial. *Stem* from a foot to a foot and half high, upright, ſtraight, naked, except at the baſe, triangular, the angles rough upwards. *Leaves* bright green, narrow, often longer than the ſtem, rough on the edges and keel. *Spike* oblong, an inch long or more, cylindrical, obtuſe, interrupted at the baſe, ſometimes branched; ſpikelets eight or ten, ſeſſile, roundiſh; male flowers uppermoſt. *Bractes* egg-ſhaped, membranous, keeled, the loweſt tipped with a narrow, rough, leafy point; the lower ones longer than the ſpikelets, ſpreading. *Glumes* egg-ſhaped, membranous, mucronate, brown, with a green keel. *Fruit* divaricated, egg-ſhaped, convex on one ſide, green, at length brown, rough at the margin towards the top, deeply cloven at the point; ſtigmas two. A native of moiſt paſtures, flowering in May and June. 29. C. *ſtellulata*, Mart. 63. Gooden. 4. Smith 5. (C. muricata, Hudſ. Lightfoot. With. 2d. ed. Lam. 20. C. echinata, Sibth. Gram. cyper. ſpicatum minimum, ſpicâ divulſâ aculeatâ, Rai Syn. 424.) "Spikelets three or four, remote; fruit divaricated, acuminate; beak not cloven." *Root* perennial, fibrous. *Stem* from ſix to twelve inches high, erect, ſtraight, naked except at the baſe, triangular; angles roughiſh upwards. *Leaves* flat, keeled, ſhorter than the ſtem; nearly erect, and roughiſh towards their point, on the edges and keel. *Spikelets* ſeſſile, alternate, roundiſh, nearly at equal diſtances, not very remote from each other; the loweſt generally ſupported by a leafy bracte; male flowers beneath the female, and leſs numerous. *Glumes* egg-ſhaped, brown, membranous and white at the edges; keel broad, green. *Fruit* ſpreading in every direction, egg-ſhaped, ribbed, mucronate, ſcarcely emarginate, not cloven, roughiſh on each ſide; ſtigmas two. Common in wettiſh barren ground, flowering in May and June. All the Engliſh botaniſts took this for C. muricata of Linnæus, till the fortunate acquiſition of the Linnæan muſeum by Dr. Smith ſet them right. It is remarkable that La Marck fell into the ſame miſtake. Dr. Goodenough, indeed, ſuppoſes that Linnæus, and the Swediſh botaniſts after him, confounded the two plants, notwithſtanding the different poſition of the male and female flowers, a character which ſtruck La Marck as a ſufficient diſtinction between this ſpecies, (his muricata) and vulpina, though in other reſpects nearly allied. 30. C. *curta*, Mart. 64. Gooden. 5. Smith 4. Willd. Car. Berol. 19. tab. 2. fig. 3. Schkuhr. 33. tab. C. fig. 13. (C. caneſcens, Lightfoot. Flor. Dan. tab. 285. Lam. 21.? C. brizoides, Hudſ. C. elongata, Leers 197. tab. 14. fig. 7. Gr. cyper. elegans, Rai Syn. 423. n. 6. and 7. 3d. ed. Pluk. Phyt. tab. 34. fig. 4. Rel. Rudb. 2. f. 34. G. cyper. ſpicis curtis divulſis. Loeſel. Pruſſ. 117. tab. 32.) "Spikelets about ſix, elliptical, a little ſeparate, naked; glumes egg-ſhaped, rather acute, membranous; tunic entire." Dr. Smith. *Root* perennial, rather creeping. *Stem* a foot high, triangular, ſmooth except in the upper part. *Leaves* linear, flattiſh upwards, narrow, ſomewhat glaucous, roughiſh, nearly as high as the ſtem. *Spikelets* from four to ſix, or more, ſeſſile, generally alternate, elliptical, obtuſe, many-flowered; the loweſt ſometimes but rarely furniſhed with a bracte; lower flowers male, fewer than the female. *Glumes* egg-ſhaped, membranous, remarkably tender; white, ſhining, with a ſlender green rib. *Fruit* egg-ſhaped, compreſſed, acute, ſmooth; ſtigmas two. *Seed* exactly elliptical. A native of watery places in England and Scotland and other parts of Europe, readily diſtinguiſhed in a ſtate of maturity by its ſilvery ſpikelets. 31. C. *caneſcens*, Linn. Sp. Pl. 16. Mart. 17. "Spikelets roundiſh, remote, ſeſſile, obtuſe; fruit egg-ſhaped, rather obtuſe." Similar to curta; ſo much ſo that Loeſel's figure referred by Dr. Goodenough and Dr. Smith to curta, is almoſt equally expreſſive of both; but when they are brought together, a wide difference preſents itſelf. The curta is ſmaller in all its parts: its bractes, moreover, are ſilvery and very tender; whereas in the caneſcens they are membranous and hard, as in the reſt of the genus, and are brown with a white edge, which gives it a real, hoary appearance. See Dr. Goodenough's remarks in Linn. Tranſ. vol. ii. p. 147. Wahlenberg, however, notwithſtanding what has been advanced by Dr. Goodenough, unites the curta of that able botaniſt with the caneſcens of Linnæus, (at leaſt of the flora ſuecica,) under the following ſpecific character. "Spikelets five, male at the baſe, rather near together; glumes nearly as long as the fruit; fruit roundiſh-ovate, rather acute, convex on one ſide, leſs ſo on the other; angles rather obtuſe; orifice two-toothed; ſtigmas two." β. "upper ſpikelets aggregate; fruit ſpreading, acute, convex on one ſide, nearly flat on the other; angles rather acute." 32. C. *elongata*, Linn. Sp. Pl. 15. Wahlen. 41. Schkuhr tab. E. fig. 25. "Spikelets oblong, ſeſſile, remote; fruit egg-ſhaped, acute." Linn. "Upper ſpikelets male at the baſe, rather near together, in a kind of raceme; rather denſely flowered; glumes ſhortiſh; fruit oblong-acuminate, convex on both ſides, obtuſely angular, ribbed, curving a little outwards; orifice nearly entire; ſtigmas two." Wahlen. A native of Europe. 33. C. *loliacea*, Linn. Sp. Pl. 13. Wahlen. 47. Schkuhr tab. P p. 10.? "Spikelets ſomewhat egg-ſhaped, roundiſh, ſeſſile, remote; fruit egg-ſhaped, roundiſh, not awned, divaricated." *Root* creeping. *Stem* even, naked towards the top. *Leaves* gramineous, tender, even. *Spikelets* from four to eight, ſmall, ſcattered at the top of the ſtem, white. Similar to C. muricata, but differs in being only half the ſize, with fruit leſs divaricated, obtuſe, not acute at the edges." Linn. "Spikelets three, male at the baſe, a little diſtant, few-flowered; glumes ſhort; fruit ſomewhat oval-elliptical, rather convex on both ſides, obtuſe, obtuſely angular, divaricated; orifice quite entire; ſtigmas two; bractes briſtly; leaves very narrow." Wahlen. A native of Sweden. La Marck is aſſured that the laſt three are all one ſpecies, in which the curta of Dr. Goodenough is doubtleſs included. He even doubts whether the ſtellulata, his muricata, is ſufficiently diſtinct. The laſt three are ranked by him under the ſpecific name of caneſcens with the following character. "Spikelets egg-ſhaped, ſeſſile, remote, nearly naked; fruit egg-ſhaped, acute, rather converging." He diſtinguiſhes two varieties; (α) the elongata of Linnæus and Leers. Scheuch. gram. 487. tab. 11. fig. 4. and probably Hall. helv. 1359. (β) the caneſcens of Linnæus and Pollich, and the loliacea of Linnæus. Rai hiſt. p. 1297. n. 10. Syn. 3d. ed. p. 424. n. 10. Loeſel. Pruſſ. tab. 32. Hall. helv. 1359? He adds that Plukenet's tab. 34. fig. 4. appears to be taken from a plant of this ſpecies in an early ſtate of the flower. 34. C. *virens*, Lam. 22. (C. nemoroſa, Mich. gen. 69. n. 4. tab. 33. fig. 10.? Gram. cyper. echinata minus, Barrel. ic. 20. n. 2.) "Spikelets egg-ſhaped, ſeſſile, rather remote; the loweſt furniſhed with a long bracteal leaf." Allied to La Marck's caneſcens, but ſufficiently diſtinguiſhed by the long bracteal leaf, as it is from remota, by having only one. *Root* perennial. *Stem* about a foot high, ſlender, triangular, leafy on the lower part. *Leaves* as long as the ſtem, about a line broad, green, ſtriated, roughiſh at the edges. *Spike* one or two inches long, ſlender, a little interrupted in its lower part; ſpikelets from five to ſeven, ſeſſile, alternate, oval, greeniſh. A native of moiſt ground in France. 35. C. *microſtachya*, Wahlen. 42. Ehrart. Schkuhr 31. tab. C. fig. 11. "Lateral ſpikelets female, few, crowded, minute; terminal one male at the baſe, three times the length of the others; glumes ſhortiſh; fruit ovate-acuminate, thin and ſomewhat membranous at the edges; ſtigmas two." A native of moiſt ground in the neighbourhood of Upſal. 36. C. *norvegica*, Wahlen. 43. Schkuhr 40. tab. S. fig. 56. "Spikelets four, male at the baſe, rather near together, oval-elliptical, turgid; fruit ſomewhat circinate, rather large, nearly orbicular, pointed, obtuſely angular, thick; ſtigmas two; bractes cuſpidate." A native of muddy ſhores in Norway. 37. C. *glareoſa*, Wahlen. 44. Schkuhr tab. A a a, fig. 97. "Spikelets three, rather crowded, oblong; terminal one male at the baſe; glumes as long as the fruit; fruit oblong, acuminate, very convex on one ſide, flat on the other, rather acutely angular, ribbed; ſtigmas two; leaves very narrow, inner one much the ſhorteſt; ſtem flaccid." A native of gravelly ſhores on the coaſt of Norway, and of the gulph of Bothnia. 38. C. *tenuifolia*, Wahlen. 48. "Spikelets three, male at the baſe, crowded, rather many-flowered; glumes nearly as long as the fruit; fruit broadly oblong-ovate, rather acute, convex on one ſide, nearly flat on the other; ſomewhat acutely angular, ſpreading; leaves very narrow." A native of Lapland in moiſt paſtures. 39. C. *remotiuſcula*, Wahlen. 50. "Spikelets about ſix, male at the baſe, ſomewhat remote, rather few-flowered; glumes ſhortiſh; fruit ovate-oblong, attenuated, convex on one ſide, flat on the other, acutely angular, ſpreading; orifice bifid; ſtigmas two; lower bractes foliaceous, long, very narrow." A native of Siberia, in the Herbarium of Swartz. 40. C. *remota*, Linn. Sp. Pl. 14.

and axillaris, 12. Mart. 15. Lam. 23. Wahlen. 51. Eng. Bot. 832. Flor. Dan. 370. (C. anguſtifolia capitulis pulchellis, Mich. Gen. 70. n. 2, 3. tab. 33. fig. 15, 16. Gram. Cyp. Rai. Syn. p. 424. n. 11. Pluk. Phyt. tab. 34. f. 3. Moriſ. §. 8. tab. 12. f. 17.) "Spikelets ſolitary, remote, nearly ſeſſile; bractes very long, overtopping the ſtem; ſeed-tunic almoſt entire." Dr. Smith. *Root* perennial. *Stem* a foot high, ſlender, feeble, triangular, rough upwards, ſmooth and roundiſh at the baſe. *Leaves* narrow, pale green, rough at their edge. *Spikelets* alternate, ſolitary, egg-ſhaped, white, about ſix or eight; three or four of the loweſt very diſtant; bractes gramineous; male flowers loweſt; glumes broad-egg-ſhaped, membranous, white, with a green keel. *Fruit* egg-ſhaped, acuminate, longer than the glume, roughiſh at the edge in the upper part, generally entire at the orifice; ſtigmas two. *Seed* lenticular. A native of moiſt groves, and banks of ditches, in ſhady places, flowering in May and June. 41. C. *gibba*, Wahlen. 52. (C. remota, Thunb. Flor. Jaq.) "Spikelets male at the baſe; lower ones ſomewhat ternate, rather diſtant; glumes ſhort; fruit ſomewhat lenticular, beaked, very convex on one ſide, a little ſo on the other, thin and entire at the edges; orifice two-toothed; ſtigmas two; bractes foliaceous, long, rather narrow; ſtem limber." A native of Japan. 42. C. *axillaris*, Mart. 12. Gooden. 8. Smith Flor. Brit. 9. Linn. Tranſ. v. 2. tab. 19. fig. 1. Wahlen. 53. Eng. Bot. 993. "Spike interrupted; lower ſpikelets in remote cluſters; upper ones ſolitary, all ſeſſile; bractes elongated; ſeed-tunic cloven." *Root* perennial, fibrous. *Stem* erect, ſtrong, ſtiff, from one to three feet high, triangular; angles rough. *Leaves* ſhorter than the ſtem, rough at the edge, and near the tip of the keel. *Spikelets* more turgid than thoſe of C. remota; the loweſt bracte about the height of the ſtem; the others ſhorter; lower flowers male; glumes egg-ſhaped, acute, membranous, browniſh, with a green keel. *Fruit* egg-ſhaped, acuminate, a little longer than the glume, rough at the edges near the tip; ſtigmas two. A native of wet ditch banks, flowering in June. The *axillaris* of Linnæus is nothing more than his *remota*, inſerted through inadvertence with nearly all the ſame ſynonyms, and with no material difference in the ſpecific character. Dr. Goodenough obſerves, that Buddle is the firſt who noticed this ſpecies, and diſtinguiſhed it from the more common remota. A ſpecimen is preſerved in his Herbarium, p. 31. n. 6. It has been found ſince by Mr. Curtis near Putney, and by Mr. Woodward near Norfolk. 43. C. *chordoriza*, Linn. Jun. Sup. p. 414. Mart. 67. Wahlen. 22. Schkuhr 17. tab. G. fig. 31. Ehrt. Phytoph. 77. "Spikelets male at the baſe, rather cloſe together; fruit ſemiglobular, woody, elongated at the baſe; ſtigmas two; loweſt leaf very ſhort; the other ſheaths leafleſs; root ſlender, creeping." Wahlen. A native of Sweden. 44. C. *heleonaſtes*, Linn. Jun. Sup. Mart. 68. Ehr. Phytoph. n. 28. Wahlen. 45. Schkuhr. 42. tab. I i. fig. 97. "Spikelets four, male at the baſe, crowded, ſomewhat globular; glumes nearly as long as the fruit; fruit egg-ſhaped, acute, convex on one ſide, a little ſo on the other, rather obtuſely angular, ſpreading; ſtigmas two; ſtem ſtiff." A native of Sweden. 45. C. *ovalis*, Mart. 65. Gooden. 6. Smith Flor. Brit. 7. Eng. Bot. 306. (C. leporina, Hudſ. Relh. Sibth. Lam. 16. Leers. t. 14. f. 6. Ehr. Phyt. n. 38. Gram. cyper. ſpica e pluribus ſpicis, &c. n. 2. Scheuchz. tab. 10. fig. 19. Moriſ. tab. 12. fig. 29.) "Spikelets about ſix, oval, near together, alternate; glumes lanceolate, as long as the fruit." *Root* perennial, creeping. *Stem* a foot high or more, erect, acutely triangular, rough at the angles, leafy at the baſe. *Leaves* deep green, flat, keeled, nearly as long as the ſtem, and ſheathing its lower part, alternate, roughiſh on the edge and keel. *Spikelets* from four to ſix, of a ruſty green colour, elliptical; bractes at the baſe of each ſpikelet lanceolate; the lower one longer than the reſt, and ending in a leafy point; male flowers inferior, few; females numerous; glumes egg-lanceolate, acute, membranous at the edge, with a green keel. *Fruit* lanceolate, acuminate, convex on one ſide, nearly entire at the orifice, rough at the edge; ſtigmas two. *Seed* roundiſh, elliptical. Dr. Smith. Common in wet marſhy paſtures, flowering in June. 46. C. *leporina*, Linn. Sp. Pl. 8. Wahlen. 35. "Spike compound; ſpikelets egg-ſhaped, ſeſſile, near together, alternate, naked." Linnæus, as appears from his references to Moriſon and Scheuchzer, confounded this ſpecies with the preceding. It is, however, as Dr. Goodenough obſerves, perfectly diſtinct. The ſpecimen in Linnæus's herbarium, now in Dr. Smith's poſſeſſion, is a ſmaller plant, with only three nearly globular ſpikelets, blunter and ſhorter glumes, and fruit entirely ſmooth. It is a native of the higheſt Alps. Wahlenberg neverthèleſs ſtill conſiders the leporina of Linnæus, and the ovalis of Goodenough, as one and the ſame plant. 47. C. *divulſa*, Mart. 58. Gooden. 14. Smith Flor. Brit. 15. Schkuhr 12. tab. Ww. fig. 89. Eng. Bot. tab. 629? (C. caneſcens, Hudſ. α. C. muricata; β. Wahlen. 28. C. nemoroſa ſpicâ longâ divulſâ, &c. Mich. Gen. 69. tab. 33. fig. 10. Gram. Cyper. ſpica longa divulſa, Rai Syn. p. 424. n. 11.) "Spike elongated, twice compounded, often branched at the baſe; lower ſpikelets remote; fruit nearly erect, nearly ſmooth at the edge." *Root* perennial, fibrous. *Stem* a foot high or more, weak, ſomewhat reclining, naked, acutely triangular; angles rough, eſpecially near the tip. *Leaves* narrow, longer than the ſtem; edge and keel rough. *Spike* interrupted in its lower part, pale green; lower ſpikelets remote, ſometimes in pairs; the loweſt often compound; bractes ſmall, broad-egg-ſhaped, ſharply keeled, ending in a rough briſtle-ſhaped leaflet, often longer than the ſpikelet; upper flowers male; glumes egg-ſhaped, acute, white; lower ones generally with a green keel. *Fruit* egg-ſhaped, convex on one ſide, without ribs, ſmooth, white, green at the tip, cloven, rough only at the tip; ſtigmas two. *Seed* orbicular, compreſſed. A native of moiſt woods, flowering in May. 48. C. *Schreberi*, Wahlen. 36. Willd. Schkuhr 30. tab. B, fig. 9. "Spikelets five, male at the baſe, ſomewhat cluſtered; glumes as long as the fruit; fruit oval-ovate, rather acute, a little convex, rather acutely angular; orifice emarginate; leaves very narrow; root creeping." A native of ſandy ſoil near Berlin. 49. C. *lagopina*, Wahlen. 37. (C. leporina, Fl. Dan. tab. 294. Approximata, Hoppe Herb.) "Spikelets three, male at the baſe, cluſtered; glumes rather ſmall; fruit ſomewhat circinate, acute, ſomewhat beaked, convex on one ſide, a little concave on the other, obtuſe and quite entire at the edges; orifice two-lipped; ſtigmas two." A native of the Lapland mountains. 50. C. *ſtraminea*, Wahlen. 38. Willd. Schkuhr 38. tab. G. fig. 34. "Spikelets five, male at the baſe, a little diſtant, ſomewhat globular; glumes lanceolate, as long as the fruit; fruit roundiſh-inverſely egg-ſhaped, beaked, membranous at the edges; orifice bifid; ſtigmas two." A native of North America. 51. C. *vulpina*, Linn. Sp. Pl. 10. Mart. 11. Lam. 19. Gooden. 15. Smith 16. Eng. Bot. 307. Leers, tab. 14. fig. 5. Flor. Dan. tab. 308. Wahlen. 29. Schkuhr. 10. tab. C. fig. 10. (C. paluſtris major, Mich. Gen. 69. tab. 33. fig. 13. Gram. Cyper. Rai Syn. 423. n. 8. Moriſ. §. 8. tab. 12. fig. 24. G. paluſtre cyperioides, Ger. Em. 21.) "Spike thrice compounded, compact, obtuſe; fruit diverging; glumes acuminate; ſtems with compreſſed, very acute angles." *Root* perennial, fibrous, forming thick tufts. *Stem* two feet high, erect, ſtiff, ſtrong, ſuddenly contracted in a ſingular manner, when it becomes the rachis of the ſpike, concavely and acutely triangular ; angles very rough. *Leaves* deep green, broad, higher than the ſtem, rough on the edges and keel. *Spike* oblong, ſometimes a little interrupted ; ſpikelets egg-ſhaped, upper flowers male ; bractes egg ſhaped at the baſe, briſtle-ſhaped at the tip, rough, ſpreading widely ; glumes egg-ſhaped, acuminate, membranous, brown, with a green keel. *Fruit* diverging, egg-ſhaped, acuminate, convex on one ſide, ribbed, cloven, and rough at the tip ; ſtigmas two. *Seed* elliptical-orbicular. A native of marſhes and the banks of rivers. 52. C. *glomerata*, Thunb. (C. vulpina, β. Wahlen. “ Spike oblong ; ſtem obtuſely angular ; leaves broadiſh, rather ſhort. A native of the Cape of Good Hope. 53. C. *brizoides*, Linn. Sp. Pl. 9. Mart. 12. Lam 18. Scop. Carn. n. 1170. Wahlen. 39. Schkuhr 32. tab. C. fig. 12. (C. ſpicis teretibus acutis alternis ſe contingentibus, Hall. Helv. 244. Mich. Gen. 70. tab. 33. fig. 17.) “ Spike compound, two-ranked, naked ; ſpikelets oblong, contiguous ; ſtem naked.” It appears from the herbarium of Linnæus that, early in life, he called the curta of Dr. Goodenough brizoides, there being a ſpecimen of it ſo named by himſelf ; but afterwards, as our excellent naturaliſt obſerves, he ſeems to have forgotten his own original determination upon the matter, for the ſpecific character given in the Species Plantarum muſt have been intended for another plant. There is a ſpecimen in the herbarium of ſir Joſeph Banks, named brizoides, which anſwers entirely to this ſpecific character, to the ſynonym of Haller, and to the figure of Micheli, and which Dr. Goodenough is perſuaded is the brizoides of the Species Plantarum. It is the only ſpecimen he has ſeen, and he has drawn the following deſcription from it. *Root* perennial, creeping. *Stem* erect, naked, triangular ; angles acute, rough. *Leaves* pale green, ſlender, longer than the ſtem, rough on the edges and the keel ; the lower ones ſhorter and ſheathing the baſe of the ſtem. *Spikelets* about ſeven, round, or a little oblong, rather in two ranks, near together, moſt frequently contiguous ; lower flowers males ; glumes oblong, acute, pale, with a green keel, ſomewhat tender, with a delicate white edge, about as long as the fruit. *Fruit* oblong, acute, ſmooth, ſomewhat triangular, minutely ſerrated at the edges, cloven at the tip, flat on one ſide ; ſtigmas two. Dr. Goodenough adds, that the true brizoides is very properly deſcribed by Schreber in his Spicilegium Fl. Lipſ. p. 63. n. 675. See Linn. Tranſ. vol. ii. p. 148. According to La Marck it differs from C. ovalis, his leporina, in having its ſpikelets longer, acute, more ſlender, and not compreſſed. His deſcription does not materially differ from Dr. Goodenough's, but he obſerves, that the ſpikelets are often curved, like thoſe of bromus pinnatus. Wahlenberg gives the following ſpecific character, which identifies his plant with thoſe deſcribed by Goodenough and La Marck. “ Spikelets numerous, male at the baſe, contiguous, ſomewhat lanceolate, ſometimes curving outwards ; fruit ovate-lanceolate, very convex on one ſide, a little concave on the other, attenuated, finely ſerrated at the edges ; orifice bifid.” A native of France, Swiſſerland, and Carniola. 54. C. *microſperma*, Wahlen. 30. “ Spike thrice compound, thickiſh ; ſpikelets, male at the top, cluſtered ; glumes pointed ; fruit ſmall, ventricoſe-oval, with a ſhort acuminate beak, acutely angular, ſomewhat diverging ; ſtigmas two leaves rather narrow.” A native of Pennſylvania, preſerved in the herbarium of Thunberg. 55. C. *arenaria*, Linn. Sp. Pl. 6. Mart. 8. Lam. 14. Gooden. 10. Smith 11. Wahlen. 32. Eng. Bot. 928. Schkuhr 8. tab. B. fig. 6. (C. maritima humilis, Mich. Gen. 67. tab. 33. fig. 4. Rai Syn. p. 423. n. 5. Pluk. Phyt. tab. 34. fig. 8. Loeſ. Pruſſ. tab. 31.) “ Spikelets cluſtered, ſpiked, almoſt monoicous ; bractes membranous ; lower ones gramineous ; ſtem triangular ; leaves flat.” *Root* perennial, creeping juſt below the ſurface in all directions, ſcaly, with downy fibres. *Stems* a foot high, numerous, erect, except when they are borne down by the ſand, naked, ſharply triangular, roughiſh in the upper part. *Leaves* ſheathing the baſe of the ſtem, erect, acuminate, rough at the edges. *Spike* egg-ſhaped, compound, compreſſed ; ſpikelets alternate, near together, brown, many-flowered ; bractes lanceolate, keeled, membranous at the edge, the lower ones lengthened out into a leaf ; male flowers in the upper part of each ſpikelet, very numerous in the upper ſpikelets ; females moſt numerous in the lower ; glumes egg-lanceolate, brown, ſcarcely membranous, pointed ; fruit egg ſhaped, acute, ribbed, bordered with a membrane on each ſide on the upper part, rough at the edge, cloven at the tip ; ſtigmas two. *Seed* lenticular or obſcurely triangular. Frequent among the ſand of the ſea-ſhore, flowering in June. 56. C. *repens*, Bellardi. App. Flor. Pedem. (C. arenaria, β. Wahlen.) “ Spikelets rather near together ; bractes ſmall, ſcaly, awnleſs ; ſtem roundiſh. A native of Piedmont. 57. C. *intermedia*, Gooden. 11. Smith 12. Wahlen. 31. Schkuhr 9. tab. B. fig. 7. (C. diſticha, Mart. 55. Hudſ. Relh. Sibthorp. C. arenaria, Leers, tab. 14. fig. 2. C. ſpicata, Pollich. n. 875. Lam. 15. Rai Syn. p. 423. n. 4. Pluk. Phyt. tab. 34. fig. 7, not good. Moriſ. § 8. tab. 12. f. 32. “ Spikelets cluſtered, ſpiked, ſome of the loweſt and the terminal one female ; intermediate ones male ; ſtem triangular, erect.” *Root* perennial, creeping, but ſtriking deep into the ground. *Stems* a foot high and more, erect, ſtiff, naked, acutely triangular, rough at the angles. *Leaves* ſheathing the baſe of the ſtem, ſcarcely as high, erect, flat, roughiſh at the edge and on the keel. *Spike* oblong, obtuſe, ruſty brown, ſoft, a little compreſſed, not at all two-ranked ; ſpikelets near together, numerous, imbricated towards the top, egg-ſhaped, often one or two male flowers at the top of the female ſpikelets, and one or two female ones at the baſe of the males ; bractes egg-lanceolate, membranous, keeled, brown, with a white edge ; lower ones ending in a briſtle-ſhaped leaf ; glumes egg-ſhaped, brown, with a pale nerve, membranous and white at the edge. *Fruit* egg-ſhaped, acute, bordered with a membrane on each ſide, rough at the edge, cloven at the tip ; ſtigmas two, ſometimes three. A native of marſhy ground. 58. C. *uliginoſa*, Linn. Sp. Pl. 7. Mart. 9. Lam. 13. “ Spike compound ; lower ſpikelets remote, furniſhed with a long gramineous bracte ; ſtem round.” Similar in appearance to C. arenaria, but the root is not manifeſtly creeping. *Stem* a finger's length, round, gloſſy, naked. *Spike* more compreſſed than in any other ſpecies, ruſt-colour ſpikelets ſeven or eight ; at the baſe of the ſpike there is a leaf of the ſame length with it, erect, gloſſy, linear. *Leaves* next the root alternate, convex beneath, channelled above, gloſſy on both ſides, linear, acuminate, ſhining, as long as the ſtem, Linn. Turf-moors in Sweden. A ſpecies ſcarcely known, and not retained by Wahlenberg. 59. C. *paradoxa*, Wahlen. 24. Willd. Act. Berol. Schkuhr. 23. tab. E. fig. 21. “ Spikes male, forming a panicle ; lower branches a little diſtant ; fruit roundiſh-oval, ſlightly convex ; angles rather obtuſe ; orifice two-toothed ; ſtigmas two.” A native of wet ground about Berlin and Hall. 60. C. *teretiuſcula*, Gooden. 16. Smith 15. Linn. Tranſ. v. ii. tab. 19. fig. 3. Eng. Bot. 1065. (C. paniculata, β. Wahlen. C. diandra, Schrank.) “ Spike twice or thrice compound, denſe, rather pointed ; ſpikelets cluſtered ; fruit ſpreading, gibbous ; ſtem roundiſh.” *Root* fibrous, ſomewhat creeping, not forming a tuft. *Stem* a foot or a foot and a half high, acutely triangular, but the ſides between the angles are convex, which gives it the roundiſh appearance expreſſed in the trivial name. *Leaves* erect, ſomewhat rigid, about the length of the ſtem, rough at the edges and on the keel. *Spike* oblong-egg-ſhaped; ſpikelets egg-ſhaped; upper flowers female; bractes egg-ſhaped, membranous, the loweſt with a rough, often very ſhort foliaceous point; glumes egg ſhaped, brown, membranous at the edges, white, with a very even keel. *Fruit* brown, egg-ſhaped, acuminate, very convex on the outſide, rather flat on the other, gibbous on both ſides at the baſe, hiſpidly ſerrated on both ſides near the tip, greeniſh cloven at the tip; ſtigmas two. *Seed* orbicular, gibbous on the outſide. A native of boggy ground. Mr. Crowe of Norwich is the firſt Engliſh recent diſcoverer of this plant, but it was known to Ray, as is evident from the addition to his deſcription of the next ſpecies. Synop. p. 197. 1ſt. ed. 422. 3d. 61. C. *paniculata*, Linn. Sp. Pl. 17. Mart. 18. Lam. 24. Weylen. 25. Leers tab. 14. fig. 4. Eng. bot. 1064. Schkuhr 23. tab. C. fig. 20. (C. ſpica multiplici ferruginea; Mich. gen. 68. tab. 33. fig. 7. C. ſpica longiore laxa. Rai Syn. 422. n. 1. Moriſ. § 8. tab. 12. fig. 23. Cyperus alpinus longus inodorus; Scheuchz. Prod. 27. tab. 8. fig. 2.) "Spike thrice compound, panicle-branched, acute, interrupted; fruit ſpreading, beaked; ſtem acutely triangular." *Root* perennial, fibrous, forming large and firm tufts in bogs which would otherwiſe be ſcarcely paſſable. *Stem* two or three feet high, erect; angles very rough; ſides flat, with many ribs. *Leaves* acuminate, erect, rough on the edges and keel. *Spike* thrice compound; branches alternate, ſomewhat ſpreading, a little ſeparate; ſpikelets egg-ſhaped; lower flowers female, few; bractes egg-ſhaped, acute, brown, rough on the keel, membranous and white at the edge, the loweſt ending in a rough briſtle-ſhaped point. *Fruit* green, lanceolate-egg-ſhaped, convex on one ſide, with a ſharp, cloven beak, rough on both ſides near the tip; ſtigmas two. *Seed* egg ſhaped, convex on the outſide. The ſpike varies in being more or leſs branched. A native of wet, ſpongy ground, flowering in June. 62. C. *rivularis*, Wahlen. 26. Willden. Schkuhr 21. tab. C c. fig. 87. "Spikelets male at the top, five, rather near together, oblong; glumes as long as the fruit, mucronate; fruit roundiſh-ventricoſe, ſomewhat beaked, membranous at the edge near the tip; orifice divided, ſtigmas two." A native of Hungary on the banks of rivers. 63. C. *ſpartea*, Wahlen. 55. (C. indica, Schkuhr 27. tab. B b. fig. 86.) "Spikes compound; branches aggregate, male, and linear at the top; glumes oval; bractes ſheathing, fruit triangular, nearly globular, rather obtuſe; orifice emarginate; ſtigmas three; leaves narrow, a little incurved at the edges." A native of the Cape of Good Hope. 64. C. *indica*, Linn. Mant. 574. Mart. 19. Lam. 26. Wahlen. 56. "Spikes cylindrical, panicled, pinnated; a few of the loweſt flowers female." Linn. *Stems* a foot and a half high, erect, obſcurely triangular, ſmooth and even. *Leaves* on the ſtem remote, rough at the edges, often longer than the ſtem. *Panicle* formed of many alternate, ſtiff, triangular, ſpreading racemes; ſpikelets alternate, nearly ſeſſile, in two rows, remote, ſpreading, imbricated on all ſides with awl-ſhaped ſcales, with two or three female flowers at the baſe; bractes ſheathing. *Fruit* egg-ſhaped, acute, triangular. Linn. Stigmas three, Wahlen. A native of the Eaſt Indies. 65. C. *polyſtachya*, Wahlen. 57. Swartz. Flor. Ind. Occid. App. "Spikes compound, pinnate; branches crowded, numerous, attenuated upwards, ſtigmas three; glumes lanceolate; bractes ſheathing; fruit lanceolate, with an awl-ſhaped recurved beak; ſtem ſtiff." A native of the higheſt mountains in Jamaica. 66. C. *cladoſtachya*, Wahlen. 58. (C. flaccida; Swartz. Append.) "Spikes compound; branches rather near together, few, weak, with ſcattered flowers; glumes lanceolate, bractes ſheathing; fruit oblong; with an awl-ſhaped beak curved outwards, ſtigmas three; ſtem flaccid; leaves very narrow." A native of mountains in Jamaica. 67. C. *ſcabrella*, Wahlen. 59. (C. laxa; Swartz Flor. Ind. Occ. App.) "Spikes compound; branches cluſtered, ſomewhat globular-ovate; bractes ſheathing; fruit oval, acute, a little curved outwards; ſtigmas three; ſtem feeble, leaves very narrow." A native of mountains in Jamaica. 68. C. *cruciata*, Wahlen. 60. "Spikes doubly compound; branches and branchlets divaricated; bractes ſheathing; fruit oval, with a ſhort beak rather curved outwards; ſtigmas three." A native of the neighbourhood of Canton in China. 69. C. *ovata*, Rudge in Linn. Tranſ. vol. 7. p. 96. tab. 9. fig. 1. "Spikes egg-ſhaped, pendulous; fruit egg-ſhaped, acute." *Stem* erect, triangular; angles acute, rough. *Leaves* erect, ſlender, rough at the edges. *Spikes* four or five, peduncled; flowers denſely imbricated; glumes egg-ſhaped, acute, brown, as long as the fruit; bractes at the baſe of the peduncles a little embracing the ſtem. *Fruit* egg ſhaped, compreſſed, acuminate, cloven at the tip; ſtigmas three, glandular, rather thick. A native of Newfoundland. 70. C. *magellanica*, Lam. 25. Schkuhr tab. N. fig. 51. (C. atrata β. Wahlen.) "Spikes oblong, on long peduncles; fruit compreſſed, lenticular." In habit and ſize reſembling Juncus campeſtris. *Stem* five or ſix inches high, leafy. *Leaves* as long as the ſtem, two lines broad, ſmooth, flat, ſtraight. *Spikes* three or four, half an inch long, brown or blackiſh, a little compreſſed; peduncles almoſt capillary, the length of the ſpikes; glumes brown, acuminate; bractes ſheathing. *Fruit* ſmooth, compreſſed, lenticular, yellowiſh, ſhorter than the glumes; ſtigmas three; gathered by Commerſon in the ſtraits of Magellan. 71. C. *brunnea*, Mart. 20. Lam. 27. Wahlen. 54. Thunb. Flor. Japon. p. 38. Schkuhr tab. X x. fig. 3. "Spikes peduncled, linear; male flowers at the top." *Stem* a foot high, triangular, ſmooth. *Leaves* linear, acute, ſtriated, keeled, entire, ſmooth, ſtraight, longer than the ſtem. *Spikes* about twelve, half an inch long, pointed, ſtraight, ſmooth, on capillary peduncles; glumes egg-ſhaped, acute; ſtigmas two. A native of Japan. 72. C. *ſubulata*, Wahlen. 69. "Spikes narrow, rather long, ſomewhat denſely flowered, male at the top; peduncles ſheathed; two-cleft; bractes foliaceous, very long, remote; glumes ending in an awn much longer than the fruit; fruit oval, triangular, depreſſed, beaked, bicuſpidate; ſtigmas three; leaves broad." A native of the Iſle of Bourbon. 73. C. *Forſteri*, Wahlen. 81. (C. debilis; Forſt. C. recurva; Schkuhr 100. tab. N. fig. 84.) "Spikes on long naked peduncles, cylindrical, pendulous, male at the baſe; bractes with rather long ſheaths, foliaceous, very long, remote; fruit oblong-ovate, attenuated, with an awl-ſhaped recurved beak; male ſpikes two; ſtigmas three. A native of New Zealand. 74. C. *atrata*, Linn. 26. Mart. 77. 31. Lam. 12. Wahlen. 114. Gooden. 36. Smith 28. Flor. Dan. 158. Schkuhr 41. tab. X. fig. 77. (Cyperoides alpinum ſpicis atris; Scheuchz. Agr. 481. tab. 11. fig. 1, 2.) "Diandrous; ſpikes egg-ſhaped, peduncled, at firſt upright, pendulous in fruit, peduncles ſcarcely ſheathed; male flowers at the bottom of the terminal ſpike; fruit compreſſed." *Root* perennial, fibrous. *Stem* a foot high and more, erect, triangular, ſtriated, leafy at the baſe; angles ſcarcely rough. *Leaves* ſhorter than the ſtem, bright green, broad, flat, rough at the edges. *Spikes* often four, egg-ſhaped, denſe, many flowered; terminal one with male flowers below, female above; the others with female flowers and a mixture of diandrous hermaphrodites; bractes foliaceous, embracing the ſtem but ſcarcely ſheathing, ſpreading; the loweſt often longer than the ſtem; peduncles triangular, ſmooth and even; glumes egg-ſhaped, black. *Fruit* imbricated, a little ſhorter than the glumes, broad-elliptical, compreſſed, yellow, without ribs, ſmooth, ſcarcely beaked, emarginate at the tip. *Seeds* triangular, ſhort, brown, ſtigmas three. A native of mountains in Wales, Scotland, and other parts of Europe. 75. C. *nigra*, Mart. 6. Allion. pedem. n. 2310. "Spikes erect, ſeſſile, ternate, terminal, black; ſtem triangular, leafy." Similar to the preceding, but differs from it in its erect, ſeſſile ſpikes. *Stem* from a finger's length to a foot high, ſtriated, longer than the leaves. *Spikes* three or four, egg-ſhaped, thick, cluſtered, the loweſt on a ſhort peduncle, with a longer bracte; the middle one ſometimes plainly male at the top; glumes egg-ſhaped, acute, black with a whitiſh edge. Allion. 76. C. *bicolor*, Mart. 62. Allion. pedem. n. 2311. See Hall. helv. n. 1369. Scarcely more than a finger's breadth in height. *Leaves* ſcarcely half the length of the ſtem, grooved in the upper part with a prominent nerve, in the lower part ſmooth. *Spikes* egg-ſhaped, the firſt on a very ſhort peduncle with a ſhort bracte, the others ſeſſile without a bracte; glumes egg-ſhaped, obtuſe, black with a whitiſh nerve. *Fruit* a little ſwelling, egg-ſhaped, obtuſe, greeniſh. Hall. helv. 1369. is quoted by La Marck as a ſynonym of atrata; and profeſſor Martyn ſuppoſes that both the laſt two are only varieties of that ſpecies. 77. C. *Buxbaumii*, Wahlen. 129. (C. polygama; Schkuhr 70. tab. X. G g. fig. 76. Buxbaum; Cent. 4. p. 33. tab. 59.) "Spikes pſeudandrogynous, nearly ſeſſile, oblong; bractes partly embracing the ſtem, foliaceous, diſtant; glumes nearly as long as the fruit, cuſpidate; fruit oval-oblong, rather obtuſe, triangular, depreſſed; orifice two-toothed; ſtigmas three. A native of Sweden and Lapland. 78. C. *bina*, Wahlen. 130. Schkuhr 26. tab. G. fig. 33. "Spikes pſeudandrogynous, two, nearly ſeſſile, oval; bractes partly embracing the ſtem, ſcaly, near together; glumes elliptical, obtuſe; fruit inverſely egg-ſhaped, triangular, pointed; orifice two-toothed; ſtigmas three." A native of Bohemia?

*** *Male and female flowers on diſtinct ſpikes; male ſpikes, in moſt ſpecies, one; in ſome, two or more.*

79. C. *digitata*, Linn. 20. Mart. 33. Lam. 38. Gooden. 18. Smith 19. Wahlen. 105. Schkuhr 63. tab. H. fig. 38. Eng. bot. 615. Leers tab. 16. fig. 4. (Gramen caryophyllatum; Loeſ. Pruſſ. 112. tab. 27. Bauh. Prod. 9. n. 23. Scheuchz. 448. tab. 10. fig. 14. Mich. gen. 65. tab. 32. fig. 9.) "Bractes membranous, rarely foliaceous, ſheathing; ſpikes linear looſe, erect; male ſpike ſhorter; leaves flat." *Root* perennial, fibrous, black, long and much branched. *Stems* ſix or eight inches high, aſcending, ſpreading, roundiſh or obſcurely triangular, ſmooth and even; ſheathed at their baſe by cylindrical, dark red, leafleſs ſcales. *Leaves* bright green, keeled; their edges rough near the baſe with teeth pointing backwards, ſmooth and even about the middle, and rough with teeth pointing forwards towards the tip; keel perfectly ſmooth; ſheaths red. *Spikes* about eight-flowered; male ſpike placed below the upper female one, ſo as to appear ſhorter, but often abſolutely longer; female ſpikes two or three; all growing in a finger-like manner; bractes half the length of the peduncles, ſheathing, oblique at the orifice, membranous, ending in a ſhort dagger-point, which ſometimes, but rarely, becomes foliaceous; glumes inverſely egg-ſhaped, retuſe, browniſh red, membranous and ſilvery at their edge, eſpecially the male flowers; keel green. *Fruit* triangularly club-ſhaped, green, pubeſcent, entire at the orifice; ſtigmas three. *Seed* acutely triangular. A native of moiſt woods, flowering in May. It appears to have been found no where in England but in Somerſetſhire and Yorkſhire. 80. C. *pedata*, Linn. 19. Mart. 28. [illegible] (Hall. helv. 1375. Gram. caryophyllum nemoroſum, ſpica multiplici, Bauh. pin. 4. Scheuchz. 450. Anguſtiſſimis foliis, Moriſ. hiſt. 3. p. 243. n. 12. Cyperoides Mich. gen. 65. tab. 32. f. 14.) "Male ſpikes ſeſſile, oblong; lower one axillary; leaves almoſt thread-ſhaped." Nearly allied to the preceding, but ſmaller, with narrower leaves and ſpikes nearer together, imitating a bird's foot. La Marck. *Root* perennial. *Stem* naked, ſlender, about the length of the leaves. *Leaves* four or five inches long, (a foot, Linn.) near a line broad, faſciculated, acute, ſtriated. *Spikes* one male, two female, nearly on a level; one female lower, proceeding, according to La Marck, from an oblong, membranous, reddiſh ſheath; according to Linnæus, from the axil of a leaf as long as the ſtem. *Fruit* ſlightly pubeſcent. A native of mountainous woods in Lapland, Switzerland, Dauphiny, and Piedmont. Wahlenberg conſiders the pedata of Schkuhr 62. tab. H. fig. 37. as only a variety of digitata; and aſſerts that the pedata of Linnæus is not now known to the Swediſh botaniſts. 81. C. *clandeſtina*, Gooden. 19. Smith 20. Wahlen. 103. Schkuhr 67. tab. K. fig. 43. (proſtrata, Mart. 69. Allion. pedem. v. 2. 267. humilis, Leyſer. Hal. 175. Villars Dauph. 2. 205. Schreb. Spic. flor. lipſ. n. 1013. Scarioſa, Lam. 37. Cyperoides montanum, Scheuch. 407. tab. 10. fig. 1.) "Bractes membranous, ſeldom foliaceous, ſheathing; female ſpikes remote, few-flowered, encloſed in the ſheaths; leaves channelled." *Root* perennial, fibrous. *Stems* in tufts, an inch or two long, rather erect, obſcurely triangular, ſmooth. *Leaves* three times as long as the ſtems, erect, deep green, very rough at the edges. *Male ſpike* terminal, ſolitary, erect, lanceolate, many-flowered; bractes ſheathing, membranous, obtuſe; glumes imbricated, lanceolate, brown, membranous and white at the edge; *females* two or three, lower, remote, alternate, peduncled, ſmall, few-flowered, (two, ſometimes one-flowered, Lam.) each concealed with its bracte. *Fruit* inverſely egg-ſhaped, triangular; orifice entire; ſtigmas three. *Seed* triangular. The leaves which overſhadow the ſtems at their firſt appearance are thoſe of the preceding year, which uſually continue green till their predeceſſors take their place. A native of mountains in Switzerland and Dauphiny. In England it has hitherto been found only on expoſed ſunny ſpots about St. Vincent's rocks near Briſtol. The ſingular circumſtance of the bracteal ſheaths encloſing the female ſpikes as well as their peduncles, induced Dr. Goodenough to call the ſpecies clandeſtina, a trivial name which is to be preferred as being diſcriminatively expreſſive, though it has not the claim of priority. 82. C. *alba*, Mart. 72. Wahlen. 104. Schkuhr 81. tab. O. fig. 55. Scop. carn. 1148. Allion. pedem. 2322. (Hall. helv. 1377. Scheuchz. tab. 10. fig. 4. 5. Mich. gen. 61. n. 79, 80. C. argentea, Villars Dauph. 2. 206.) "Spikes peduncled, white, ſheaths long, obtuſe; filaments and ſtyles long, white." *Stem* round, ſlender, with three white leafy ſheaths. The two upper *ſpikes* from one ſheath, the lower ſingle. *Glumes* of the male ſpike almoſt tranſparent: of the female ſpikes keeled, acuminate; anthers terminating in a lucid point; female flowers few. *Fruit* turgid, roundiſh, ſmooth, ſtriated, growing black in autumn. *Seed* triangular, ſhining, acuminate. Linnæus was either unacquainted with this ſpecies, or confounded it with digitata. Scop. 83. C. *Penſylvanica*, Lam. 36. "Spikes variegated with brown and white; male terminal, oblong; female ſeſſile, egg-ſhaped, either with or without a bracte." *Stem* nine or ten inches high, upright, very ſlender, triangular, leafy only at their baſe. *Leaves* ſcarcely half the length of the ſtem, leſs than a line broad, flat, ſtriated. *Male ſpike* terminal, upright, a little acute; glumes

oblong, obtuſe, ſmooth, reddiſh brown, membranous and white at their edges. *Female ſpike* a little below the male, ſeſſile, egg-ſhaped, ſhort, few-flowered, ſometimes without, and ſometimes with a bracte, ſcarcely the length of the ſpike; glumes ſimilar to thoſe of the male. At the baſe of the male ſpike there is ſometimes the rudiment of another female ſpike not diſtinctly ſeparated from it. A native of Pennſylvania and New York. 84. C. *ſupina*, Wahlen. 106. Wilden. (C. glomerata, Schkuhr 65. tab. I. fig. 41.) "Female ſpikes about two, nearly ſeſſile, globular; bractes ſomewhat embracing the ſtem, ſcaly, crowded; fruit nearly globular, beaked; orifice two-lobed; ſtigmas three; male ſpike ſlender; leaves very narrow." 85. C. *varia*, Wahlen. 107. "Female ſpikes few-flowered, nearly ſeſſile; male ſlender; bractes ſomewhat embracing the ſtem, ſcaly, rather near together; glumes acuminate, mucronate, rather long; fruit oval-ventricoſe, rather acutely triangular, a little hiſpid; beak awl-ſhaped, ſhortiſh, bifid; ſtigmas three; leaves very narrow." A native of North America. 86. C. *pilulifera*, Linn. Sp. Pl. 24. Mart. 28. Lam. 29. Gooden. 37. Smith 37. Eng. bot. 885. (C. montana, Linn. Sp. Pl. 21. Hudſ. 407? C. filiformis, Fl. Dan. tab. 1048. C. conglobata, Mart. 70. Allion. pedem. n. 2314. Hall. helv. n. 1372. Scheuch. tab. 10. fig. 8, 9.? Gramen cyperoides, Rai Syn. p. 421. n. 19 and 20. Pluk. Phyt. tab. 91. fig. 8.) "Bracteal ſheaths none; female ſpikes ſeſſile, crowded, roundiſh; glumes mucronate; fruit roundiſh, villous." *Root* perennial, fibrous. *Stem* often recumbent, incurved, about nine inches high, feeble, naked, rough near the top. *Leaves* deep green, rough at the edges and on the keel. *Bractes* briſtle-ſhaped, ſhort, triangular, ſcarcely at all ſheathing. *Male ſpike* lanceolate, acute; glumes of a ruſty brown colour, lanceolate, acute, with a green keel, and a membranous white edge. *Female ſpikes* two or three, ſeſſile, cloſe together, roundiſh, ſpreading; glumes egg-ſhaped, acute, coloured like thoſe of the male. *Fruit* ſhorter than the glumes, roundiſh, obſcurely triangular, green, villous on all ſides. *Seed* nearly globular, yellowiſh. It varies with blunt glumes, leſs conſpicuouſly keeled. Dr. Smith. This is certainly the C. montana of the Linnæan herbarium, and Dr. Smith concludes from the reference to Plukenet, that he deſcribed it from that author as his original pilulifera, without having a ſpecimen before him. Dr. Goodenough thinks it certain that he ſpake of one and the ſame plant under two names; in its more fruitful ſtate with three female ſpikes, calling it *pilulifera*, and in its more ſtarved appearance when produced on elevated dried plains, where it has only two, and ſometimes only one, *montana*. La Marck has a montana which he thinks may poſſibly be the montana of Linnæus, excluding the ſynonyms. It ſeems to differ from pilulifera in having ſhorter leaves, blackiſh ſpikes, and fruit more evidently downy, and quotes as probable ſynonyms, cyperoides anguſtifolium montanum, folliculis feminum villoſis, Scheuch. gram. 423. and Hall. helv. n. 1373. It was ſent him from Switzerland by M. Vahl. Wahlenberg, who with reſpect to Swediſh plants muſt be good authority, determines the pilulifera and montana of Linnæus to be different plants, and gives the following ſpecific characters. C. *pilulifera*, n. 112. Willdenow. Schkuhr 46. tab. I. fig. 39. "Spikes nearly ſeſſile, globular; male ſlender; bractes partly embracing the ſtem, ſomewhat foliaceous, attenuated, near together; glumes mucronate, rather long; fruit ſomewhat globular, acute, pubeſcent; ſtigmas three; ſtem feeble, finely ſerrated. 87. C. *montana*, Linn. Wahlen. 109. Schkuhr 58. tab. F. fig. 29. "Spikes rather few-flowered, nearly ſeſſile; bractes crowded, ſomewhat ſcaly, embracing the ſtem; keel cuſpidate; bractes pitch-coloured, mucronate, as long as the fruit; fruit oval-wedge-ſhaped, rather acutely triangular, a little rough; ſtigmas three; leaves very narrow." 88. C. *mucronata*, Mart. 71. Wahl. 40. Allion. pedem. n. 2318. Hall. helv. 1374. Mich. gen. tab. 32. fig. 3. Schkuhr 46. tab. K. fig. 44. "Spikes ſeſſile, near together, very ſhort; glumes lanceolate, mucronate." *Stem* a foot high, naked at the top. *Leaves* ruſh-like. *Spikes* generally three; male, longer, round; females two, five-flowered; glumes bay, ovate-lanceolate, pale about the edge; nerves yellow, ſhining; bracteal leaf of the lower ſpike with a long ſlender point, much longer than the ſpike. Haller. *Stigmas* two. Wahlen. 89. C. *tomentoſa*, Linn. Mant. 123. Mart. 25. Lam. 32. Smith 38. Leers. 200. tab. 15. fig. 7. Wahlen. 108. Schkuhr 51. tab. F. fig. 29. "Bracteal ſheaths very ſhort; female ſpikes nearly ſeſſile, cylindrical, obtuſe; glumes elliptical, acute; fruit downy." *Root* perennial, creeping. *Stem* a foot high, erect, naked, acutely triangular, angles near the top rough. *Leaves* ſhorter than the ſtem, erect, flat, bright green, rough on both ſides, and at the edges. *Bractes* foliaceous, a little ſpreading, ſcarcely longer than the ſtem. *Male ſpikes* lanceolate, rather obtuſe; glumes lancolate, of a ruſty brown colour, with a green keel, the upper ones ſlightly mucronate. *Female ſpikes* generally two, not very near together, cylindrical, obtuſe, various in length, on ſhort peduncles; glumes elliptic-egg-ſhaped, ſcarcely mucronate, of a ruſty brown colour, with a bright green keel. *Fruit* about the length of the keel, denſely imbricated, roundiſh, a little compreſſed, ſcarcely triangular, green, clothed on all ſides with denſe, ſhort down, which at firſt is white, and finally of a gold colour. *Seed* white, obſcurely triangular. Dr. Smith. *Stigmas* three. Wahlen. Found by Mr. Teeſdale in meadows near Merſton Merſey, Wiltſhire. La Marck's plant, which does not materially differ, was gathered in the neighbourhood of Paris. 90. C. *ſaxatilis*, Linn. Sp. Pl. 25. Wahlen. 140. (Cyperoides alpinum ſaxatile, Mich. gen. 63. tab. 32. fig. 4?) "Spikes three, egg-ſhaped, ſeſſile, alternate; male oblong." *Terminal ſpike* male, of a pale ruſty colour. *Female ſpikes* two, black, the lower one with a briſtle-ſhaped leaf, ſhorter than the ſpike; glumes the length of the piſtils; germs black, triangular; ſtyles black, bifid, long. A native of the mountains of Lapland and Switzerland. La Marck ſuppoſes that it ſcarcely differs from the preceding. Wahlenberg gives it the following character, which proves it diſtinct. "Spikes nearly ſeſſile, rather denſely flowered, very obtuſe; male oval; glumes circinate, white at the edge; bractes partly embracing the ſtem, with largiſh auricles, foliaceous, very narrow, diſtant; glumes nearly as long as the fruit; fruit oblong, oval upwards, flat on both ſides, rather acute, a little curved outwards; orifice equal; ſtigmas two." 91. C. *præcox*, Mart. 84. Lam. 31. Jacq. Auſt. tab. 446. Gooden. 22. Smith 36. Wahlen. 98. Schkuhr. 59. tab. F. fig. 27. (C. ſaxatilis, Hudſ. C. montana, Relh. 353. Lightf. 551. Gram. cyper. vernum minimum, Rai Syn. 421. Ger. em. 22. Moriſ. § 8. tab. 12. fig. 11.) "Bracteal ſheaths nearly as long as the peduncle; ſpikes egg-ſhaped, near together; glumes a little mucronate; fruit roundiſh, pubeſcent." *Root* creeping, and branching out into ſeveral leafy tufts. *Stem* aſcending, from three to ſix inches high, naked, obſcurely triangular, ſmooth. *Leaves* ſhort, rigid, recurved, a little revolute, roughiſh, eſpecially at the edges. *Bractes* erect, often wanting; ſheaths ſhort, dilated upwards. *Male ſpike* inverſely egg-ſhaped, rather obtuſe; glumes elliptical, of a ruſty colour, bluntiſh; anthers ſulphur-coloured. *Female ſpikes* generally two, near together, on ſhort peduncles, egg-ſhaped, nearly erect;

glumes broad, egg-ſhaped, rather pointed, of a ruſty colour, with a green keel. *Fruit* ſcarcely the length of the glume, roundiſh or ſomewhat pear-ſhaped, pubeſcent, green, brown at the tip. *Stigmas* three. *Seed* white. A native of dry expoſed paſtures and heaths, flowering in April. 92. C. *triſtachya*, Mart. 30. Wahlen. 101. Schkuhr tab. W w, fig. 109. Thunb. Jap. 38. "Spikes three, ſeſſile, linear, male longer." *Stem* four inches high, triangular, capillary, ſtriated, ſmooth, erect. *Leaves* only one or two, alternate, linear, ſmooth, reflected, ſhort. *Bractes* ſhorter than the ſpikes. A native of Japan. 93. C. *trigona*, Mart. 74. Allion. pedem. n. 2325. tab. 89. fig. 4. "Male ſpike peduncled; females ſeſſile, remote, triangular." *Stem* a foot high or more, triangular, ſtriated, ſmooth, leafy. *Leaves* dark green, ſtriated, linear, ſhorter than the ſtem. *Male ſpike* oblong; glumes bay, obtuſe. *Female ſpikes* three, axillary; upper one frequently androgynous; leaf of the loweſt very long. A native of Piedmont. 94. C. *folioſa*, Mart. 75. Allion. ped. n. 2328. Hall. helv. 1384. "Female ſpikes ſeſſile; loweſt peduncled; glumes very narrow." *Stem* a foot high, triangular. *Leaves* as long as the ſtem, about two lines broad, ſmooth, with rough edges. *Male ſpike* long, cylindric, ſlender, pale bay and white. *Female ſpikes* two, (ſometimes four) crowded, each with a long leaf. *Fruit* ſlender, with long beaks. Hal. A native of Piedmont and Switzerland. 95. C. *obeſa*, Mart. 77. Allion. ped. 233 . Hall. helv. 1387. "Female ſpikes ſeſſile, ternate; fruit egg-ſhaped, triangular." *Stems* four inches high, naked. *Leaves* ſhort, not above a line in breadth, rough. *Male ſpike* half an inch long, dark bay, obtuſe, broadiſh. *Female ſpikes* two or three, diſtant, ſhorter than the male, of the ſame colour, few-flowered. There is ſometimes an androgynous ſpike under the male. A native of Piedmont and Switzerland. 96. C. *globularis*, Linn. Sp. Pl. 22. Wahlen. 111. "Male ſpike oblong; female ſeſſile, egg-ſhaped, with a bracte ſhorter than the ſpike." Linn. "Spikes nearly ſeſſile, egg-ſhaped; male ſlender; bractes partly embracing the ſtem, ſomewhat foliaceous, diſtant; glumes ſhortiſh; fruit oval-ovate, acute, rough; ſtigmas three; ſtem flaccid; leaves very narrow." Wahlen. A native of Sweden and Lapland; common. 97. C. *alpina*, Wahlen. 113. Swartz. Liljeblad Suec. flor. (C. Vahlii, Schkuhr 72. tab. G g, fig. 94. C. montana, Flor. Dan. 403.) "Spikes three, on ſhort peduncles, ſomewhat globular, pſeudandrogynous; bractes partly embracing the ſtem, ſomewhat foliaceous, near together; glumes very black; fruit rather pubeſcent, pointed." A native of Lapland. Very variable and difficult to be characterized, but perfectly diſtinct. 98. C. *ericetorum*, Lam. 33. Pollich. pal. n. 886. Schkuhr Wahlen. 110. (C. approximata, Allion. ped. 2313. C. ciliata, Willden. Schkuhr 66. tab. 3. fig. 42. Hall. helv n. 1371. Scheuch. gram. 421. tab. 10. fig. 10.) "Male ſpike inverſely egg-ſhaped, obtuſe; female ſpikes ſeſſile, egg-ſhaped; fruit pubeſcent." *Stem* four inches high, triangular, almoſt naked. *Leaves* in tufts, rather rigid, keeled, about the length of the ſtem. *Male ſpike* terminal, ſhort, variegated with brown and white; glumes obtuſe, blackiſh brown, white and ſilvery at the edge. *Female* generally ſolitary, ſometimes two, alternate, near together; bracte of the lower one terminated by a ſhort, nearly awl-ſhaped leaf. A native of Switzerland and Germany, on dry hills. La Marck doubts whether it may not be the globularis of Linnæus; but Wahlenberg's deſcription of that ſpecies given above, proves the conjecture to be erroneous. 99. C. *Borbonica*, Lam. 34. "Female ſpikes erect. ſeſſile; upper ones crowded; male thicker, terminal; leaves ſword-ſhaped. *Stem* a foot high, leafy, enveloped at its baſe with the ſheaths of numerous root leaves. *Leaves* reſembling thoſe of ixia crocata, nearly as long as the ſtem, about three lines broad, ſtriated. *Female ſpikes* three or four, acute; lower one diſtant from the others, in the axil of a narrow leaf; glumes acute, reddiſh, with a green keel. Found by Commerſon in the Iſle of Bourbon. 100. C. *Virginiana*, (C. ſtricta, Lam. 35.) "Female ſpikes two, ſeſſile, erect, with male flowers at the top; male terminal, remote; ſtem naked." *Stem* about a foot high, ſlender, compreſſed above, triangular below, rough. *Leaves* as long as the ſtem, near two lines broad, ſtriated. *Male ſpike* terminal, an inch long; glumes obtuſe; brown with a white edge. *Female ſpikes* diſtant from the male, ſeſſile, upright, linear, preſſed cloſe, reddiſh brown, with ſome male flowers at the top; lower one with a bracteal leaf as long as the ſpike. A native of Virginia, Pennſylvania, &c. deſcribed by La Marck from a dried ſpecimen. 101. C. *nana*, Lam. 40. Scheuch. Gram. 437. tab. 10. fig. 12. "Spikes erect, variegated; male egg-ſhaped; lower female peduncled, axillary." *Stem* an inch and half, or two inches high, with three or four ſhort, upright, acute, ſheathing leaves. *Root leaves* ſtriated, ſlightly keeled, ſmooth, about the length of the ſtem. *Spikes* three or four; male terminal, upright; glumes oval, ſmooth, mucronate, brown, with a green keel, and a membranous, whitiſh edge; females upright, oblong, coloured like the male. A native of mountains in Switzerland. 102. C. *alpeſtris*, Mart. 76. Allion. ped. n. 2329. Hall. helv. n. 1385. (C. gynobaſis, Villars dauph. 2. 206. Wahlen. 99. Schkuhr 59. tab. G. fig. 35. "Loweſt female ſpike radical; fruit triangular, elongated." *Stems* from three to nine inches high, naked. *Leaves* in tufts, two lines broad, keeled, acuminate, ſmooth except at the tip. *Spikes* very ſmall; male four lines long; glumes egg ſhaped, obtuſe, with a yellow keel and white edge; upper female ſpike ſeſſile, an inch below the male, few-flowered; bracte ſheathing long, awned; lower one with about ſix flowers, on a peduncle, three inches long or more. There are ſometimes, but rarely, three female ſpikes. A native of Piedmont and Switzerland. The alpeſtris of La Marck agrees in ſome reſpects with the preceding, but as he ſays nothing of the great diſtance of the lower female ſpike from the others, from which circumſtance Villars took his trivial name, it muſt be a different plant. He received it from the neighbourhood of St. Maurice in the Valais, and as he gives no ſynonyms, certainly ſuppoſed it a nondeſcript. We ſhall call it for the preſent 103. C. *Lamarckii*, "Female ſpikes about three, erect; upper ones ſeſſile; fruit ſmooth, globular, mucronate." *Stem* ſeven or eight inches high, naked, ſlender, cylindrical, compreſſed, ſtriated. *Leaves* in tufts three or four inches long, glaucous, ſtriated, ſmooth. *Spikes* three, or four of a ruſſet colour; male terminal, half an inch long; ſcales rather obtuſe, membranes at the edges; the upper female ſpikes ſhort, nearly ſeſſile, each with a pointed bracte about its own length; loweſt larger, peduncled, in the axil of a very narrow bracteal leaf longer than the ſpike; glumes egg-ſhaped, rather blunt, ſmooth, ruſſet, membranous and white at the edge. *Fruit* ſmooth, almoſt globular, mucronate. 104. C. *tenuifolia*, Lam. 52. Poiret. Voyage en Barbarie. Vol. 2. p. 254. "Female ſpikes erect, few-flowered; lower ones diſtant on long peduncles; upper ones nearly ſeſſile; leaves very narrow." *Root* perennial, creeping, blackiſh, ſurrounded at the top with numerous brown filaments. *Stems* ſeveral, ſix or ſeven inches high, very ſlender, triangular, compreſſed, moderately leafy. *Leaves* very narrow, filiform ſmooth, green, keeled, a little folded in at the edges, longer than the ſtems. *Male ſpike* terminal, about half an inch long, upright, oblong, acute, of a ruſſet colour.

*Female* ſpikes upright, leſs than the male, few-flowered, of a ruſſet-green colour, diſtant from each other, upper one near the male with a ſcaly bracte; the two others peduncled and axillary; the loweſt in a very long, capillary peduncle, which ſprings almoſt from the bottom of the ſtem; glumes egg-ſhaped, ſcarcely acute, greeniſh and ſtriated on the back, red or ruſt-coloured at the edge near the tip. A native of Barbary on moiſt, elevated ground. This plant is nearly allied to the alpeſtris of Allioni, but differs in the breadth of the leaves, and colour of the glumes. 105. C. *hordeiformis*, Wahlen. 72. (C. hordeiſtichos; Villars, 2. n. 43. tab. 6.) "Spikes very thick; peduncles ſheathed; bractes foliaceous, very long; the loweſt nearly radical, the others rather near together; fruit egg-ſhaped, acuminate, ſomewhat beaked, very convex on one ſide, a little concave on the other, ſerrate-ciliated at the edges; orifice bifid; ſtigmas three; male ſpikes two." A native of Dauphiny. 106. C. *firma*, Wahlen. 100. Hoſt. Schkuhr 69. tab. O. Y, fig. 54. "Spikes ſtiff, oblong, rather many-flowered; peduncles naked; bractes ſomewhat foliaceous, rather remote; ſheaths ſhort; fruit oblong, lanceolate, with a ſlender beak, acutely and finely ſerrated at the edges; ſtigmas three, orifice one-lobed." A native of the Auſtrian alps. 107. C. *verna*, Wahlen. 102. Schkuhr 74. tab. L. *fig.* 46. "Spikes oval; peduncles naked; bractes foliaceous, diſtant; ſheaths very ſhort; glumes broad-ovate, obtuſe; fruit oval, pointed; orifice obtuſely one-lobed; ſtigmas three; ſtem acutely angular." A native of Switzerland. 108. C. *ferruginea*, Mart. 78. Wahlen. 84. Allion. ped. n. 2333. Scop. Carn. 1159. Hall. helv. 1390. Scheuch. 10. 6. (C. alpina, Schrank.) "Male ſpike acuminate; female two or three, ſlender, peduncled; glumes ruſt-coloured; fruit bifid." *Stem* half a foot high, pale green. *Male ſpike* an inch long, glumes long, narrow, acuminate, ruſt-coloured, with a green keel. *Female ſpikes* three or four; the firſt with a ſhort bracte, the ſecond with a leaflet as long as itſelf, the third with a longer leaflet; glumes green with a ruſt-coloured edge; ſtigmas three. A native of Switzerland, Piedmont, and, if Scopoli be right in thinking his plant the ſame as Haller's, of Carniola, though it is not alpine there as it is in the Griſons. 109. C. *ſempervirens*, Villars dauph. 2. 214. *Stems* eight or ten inches high, ſlender, hard. *Leaves* in tufts, long, hard but flexible, continuing through the winter till the new ones come up when they are completely bleached. *Spikes* three; male blackiſh, variegated with grey; females looſe, peduncled; glumes blackiſh-brown with a green keel. *Fruit* triangular, blackiſh, ſmooth, except near the top. *Seed* triangular, grey, elongated. A native of Dauphiny. Profeſſor Martyn gives it as a conjectural ſynonym of the preceding, becauſe Villars has referred to Scopoli and Haller with a mark of doubt. 110. C. *frigida*, Mart. 79. Wahlen. 83. Allion. ped. 2344. Hall. helv. n. 1391. Villars dauph. 2. 215. (C. variegata; Lam? C. fuliginoſa; Schkuhr. 76. tab. C. c, fig. 47.) "Female ſpikes three or four, two-rowed; fruit long, pointed." Mart. "Spikes three, nearly erect, brown and white; glumes membranous at the tip; fruit acuminate, roughiſh." Lam. *Stem* half a foot high and more, naked. *Leaves* a line broad or more, ſmooth, except at the edge. *Male ſpike* near an inch long, often fertile at the bottom; glumes ſharply lanceolate, ſhining bay, with a green or yellowiſh keel. *Female ſpikes* axillary, lower ones pendant. Hall. Villars ſays it differs little from his ſempervirens. La Marck refers to Haller and Allioni with a mark of doubt. He gives the following deſcription from a dried ſpecimen gathered on the mountains of Dauphiny. *Root* perennial, ſtrong, with greyiſh or brown fibres. *Stem* from ſeven to ten inches high, ſlender, naked. *Leaves* unequal in length, the largeſt five inches long, and little more than a line broad, ſtriated, ſmooth, hard, firm. *Male ſpike* terminal, upright, five or ſix lines long; glumes obtuſe, very membranous and white at the tip, brown on the back with a whitiſh line. *Female ſpikes* two, peduncled, eſpecially the loweſt, ſhort, brown, variegated, pendant when in fruit. *Fruit* egg-ſhaped, acuminate, compreſſed before they arrive at maturity, a little rough. 111. C. *rigida*, Mart. 82. Gooden. 38. Linn. Tranſ. vol. iii. tab. 22, fig. 10. Smith 39. Wahlen. 141. Schkuhr 47. tab. U, fig. 71. (C. n. 1378. Hall helv. C. fuſca; 73. Mart. C. ſaxatalis; Flor. Dan. tab. 159. Cypercides germanicum; Mich. gen. 61. tab. 32. fig. 4.) "Digynous; bracteal ſheaths none; ſpikes egg-ſhaped; upper ones ſeſſile; leaves ſomewhat recurved, rigid; fruit rather compreſſed." *Root* perennial, thick, creeping. *Stem* from three to ſix or ſeven inches high, often curved, naked, rigid, acutely triangular; angles rough. *Leaves* rigid, recurved, rather glaucous, rough at the edges and on the keel. *Bractes* foliaceous, ſhorter than the ſtem, often recurved, auricled at the baſe. *Male ſpike* ſhort, egg-ſhaped, rather obtuſe, thick, rarely two; glumes obtuſe, with a delicate greeniſh keel. *Female* often three, egg-ſhaped; two upper ones ſeſſile, near the male, lower rather remote, erect, on a ſhort peduncle; glumes elliptical, obtuſe, black, with a white edge and a fine green keel. *Fruit* longer than the glumes, denſely imbricated, elliptical, rather compreſſed, flattiſh on one ſide, ſmooth, brown outwards, ſometimes lengthened at the tip, and recurved; orifice always undivided; ſtigmas two, thickiſh. On the top of Snowden in Wales; Ben Lomond and other mountains in the highlands of Scotland, flowering in June and July. 112. C. *brachyſtachya*. Wahlen. 82. Schrank. Schkuhr 83. tab. P. fig. 58. "Spikes on long naked peduncles, very narrow, ſhort, looſely flowered; bractes ſheathing, ſomewhat foliaceous, rather remote; glumes ſhort, ſomewhat mucronate; fruit lanceolate; orifice two-toothed; ſtigmas three; ſtem briſtle-ſhaped; leaves very narrow, convolute." A native of Switzerland. 113. C. *pulla*, Gooden. Linn. Tranſ. vol. iii. tab. 17. Smith 29. Wahlen. 142. (C. fuſca; Schkuhr. 52. tab. C c. fig. 88. C. globularis var. Vahl.) "Digynous; bracteal ſheaths none; ſpikes egg-ſhaped; lower one peduncled; fruit elliptical-inflated, ſomewhat beaked, emarginate." *Root* perennial, creeping. *Stem* nearly erect, ſix or ſeven inches high, ſtriated, triangular; angles rough towards the top. *Leaves* nearly erect, flat, rough at the edge. Bracte foliaceous, embracing the ſtem ſcarcely ſheathing, rough at the edge. *Male ſpike* terminal, erect, lanceolate, many-flowered; females often two, remote, egg-ſhaped, erect; the lower on a long peduncle, the upper on a ſhort peduncle, with a very ſhort ſheath, often none; peduncle rough; glumes all elliptic-lanceolate, obtuſe, blackiſh brown, with a fine white edge and a faint nerve. *Fruit* ſpreading, longer than the glume, elliptical, ſmooth, not ribbed, pale at the baſe, blackiſh brown at the tip, ſhining. *Seed* triangular; ſtigmas two. A native of mountains in the highlands of Scotland, flowering in July. 114. C. *palleſcens*, Linn. Sp. Pl. 29. Mart. 34. Lam. 46. Wahlen. 121. Schkuhr 92. tab. K. k, fig. 99. Flor. Dan. 1050. Leers. 203. tab. 15. fig. 4. (Gram. cyper. Rai ſyn. 419. n. 8. Pluk. Phyt. tab. 34. fig. 5. Mich. gen. 61. tab. 32. fig. 13.) "Bracteal ſheaths very ſhort; ſpikes cylindrical, peduncled; fruit-bearing ones pendulous; fruit elliptical, inflated, obtuſe." *Root* perennial, fibrous. *Stem* a foot high or more, erect, leafy at the baſe, triangular; angles rather acute near the top, rough. *Leaves* flat, pale, ſomewhat hairy, roughiſh at the edges. *Bractes* foliaceous, erect, conſiderably longer than the ſtem, with very ſhort ſheaths. *Male ſpike* terminal, lanceolate, erect, denſe, pale ruſt-colour; females three, peduncled, firſt erect, afterwards pendulous; peduncles triangular, ſmooth, and even; glumes egg-ſhaped, acuminate, yellowiſh, with a green keel. *Fruit* the length of the glumes, elliptical, inflated, very obtuſe, awnleſs, without ribs, ſmooth, pale green. *Stigmas* three. *Seed* triangularly-inverſely egg-ſhaped. A native of moiſt paſtures and woods in England, and other parts of Europe, flowering in May and June. 115. C. *clavata*, Wahlen. 64. Thunb. in Herbar. "Spikes nearly cylindrical, thick; male club-ſhaped; bractes ſheathing the peduncle, foliaceous, remote; glumes nearly as long as the fruit, mucronate; fruit roundiſh, oval, gibbous, curved outwards, beaked; ſtigmas three; leaves very broad." β. C. cylindracea. "Spikes cylindrical, thickiſh; males ſeveral; bractes foliaceous, broad, and long." γ. C. triticea (C. clavata, Thunb. Prod. p. 14.) "Spikes oval, very thick, male at the top; glumes as long as the fruit, a little cuſpidate." A native of the Cape of Good Hope. 116. C. *flava*, Linn. Sp. Pl. 18. Mart. 21. Lam. 28. Wahlen. 61. Eng. Bot. 1294. Flor. Dan. tab. 1047. Leers, tab. 15. fig. 6. (Gramen paluſtre echinatum, Rai Syn. p. 421. n. 18. Ger. Em. 17. G. cyper. Moriſ. § 8. tab. 12. fig. 19.) Marſh hedgehog graſs. "Bracteal ſheaths ſhort, nearly the length of the peduncles; female ſpikes roundiſh; fruit beaked, curved downwards; ſtem nearly ſmooth." *Root* perennial, creeping. *Stem* often a foot high, erect, leafy below, triangular; angles generally ſmooth and even, ſometimes a little rough. *Leaves* bright green, erect, rather broad, flat, longer than the ſtem, rough on the edges and on the keel, marked with two rough lines on their upper ſide towards the extremity. *Bractes* foliaceous, much longer than the ſtem; upper ones ſpreading, deflexed, with a very ſhort ſheath; the loweſt with a longer ſheath, and leſs ſpreading. *Male ſpike* lanceolate, erect, denſe, very ſeldom more than one; female about three, roundiſh, egg-ſhaped, ſpreading; upper ones generally near together, moſt commonly ſeſſile; loweſt more remote, peduncled; peduncle a little ſhorter than the ſheath; glumes egg-ſhaped, tawny, with a green rib. *Fruit* longer than the glumes, ſpreading every way, egg-ſhaped, inflated, ſmooth, ribbed, cloven at the tip, triangular; angles not at all rough; ſtigmas three. *Seed* ſmall, triangularly-inverſely egg ſhaped, black. Common in boggy meadows, flowering in May and June. 117. C. *oederi*, Oeder, Roth, Hoffmann. Ehrh. Willd. Schkuhr 35. tab. f. (C. flava, β flaveſcens, Wahlen. C. extenſa, Relh. Flor. Cant.) "Bractes rather diſtant; fruit oblong-inverſely egg-ſhaped, a little inflated, with a ſhort awl-ſhaped beak, not recurved; orifice two-toothed; ſtem obtuſely angular; leaves narrow, the lower ones the longeſt, incurved at the edges." Wahlen. Common near Yarmouth. Mr. Dawſon Turner obſerves (ſee Botaniſts Guide, vol. ii. p. 75.), that he can find no ſatisfactory marks of diſtinction between this and the preceding ſpecies, and yet it is ſo conſtant in its appearance, in all ſituations, whether wet or dry, that though Schkuhr is inclined to conſider it only as a variety of flava, he cannot but believe it diſtinct. He adds, that Mr. Brunton pointed out to Dr. Smith the ſame leading diſtinction as was noticed by Dr. Roth, the fruit expanding in all directions, and not at all recurved. Mr. Turner ſuſpects that it has been miſtaken by many Britiſh botaniſts for the much more rare C. extenſa. 118. C. *extenſa*, Mart. 80. Gooden. 25. Linn. Tranſ. vol. ii. tab. 21. fig. 7. Smith 33. Wahlen. 65. Eng. Bot. 833. Sch. tab. X x. fig. 72. (Cyperoides echinatum majus, Dill. in Rai Syn. 421.) "Bracteal ſheaths and peduncles very ſhort; bractes very long; female ſpikes roundiſh; fruit egg-ſhaped; ſtem ſmooth." *Root* perennial, fibrous. *Stem* near a foot high, erect, or aſcending, ſometimes curved, obſcurely triangular, perfectly ſmooth. *Leaves* narrow, recurved, channelled, rough at the edges towards the point. *Bractes* foliaceous, very long, curved; ſheaths dilated, very ſhort. *Male ſpike* generally ſolitary, lanceolate, bluntiſh, ſometimes with a few female flowers in the lower part. *Female* two or three, near together, almoſt ſeſſile, erect, egg-ſhaped, rarely cylindrical, finally roundiſh; glumes all broad egg-ſhaped, three-nerved. *Fruit* longer than the glumes, erect, but a little ſpreading, egg-ſhaped, ribbed, ſmooth at the edges, and every where deſtitute of pubeſcence: ſtigmas three. *Seed* triangular, gibbous. A rare native of the ſea-coaſt, flowering in June. 119. C. *fulva*, Mart. 81. Gooden. 26. Linn. Tranſ. vol. ii. tab. 20. fig. 6. Smith 32. Wahlen. 62. Eng. Bot. 1295. Sch. 86. fig. 67. "Bracteal ſheaths long, but ſhorter than the peduncle; female ſpikes egg-ſhaped; fruit beaked, ſtraight; ſtem rough." *Root* perennial, creeping. *Stem* near a foot high, erect, ſlender, triangular; angles at leaſt near the top acute, and very rough. *Leaves* upright, narrow, ſhorter than the ſtem, rough at the edges and on the keel, but not on the upper ſide. *Bractes* foliaceous, upright, ſhorter than the ſtem; ſheaths long, browniſh at the tip. *Male ſpike* linear, erect, denſe, many-flowered; glumes egg-ſhaped, obtuſe, membranous, and white at the edge, with an obſcure nerve of the ſame colour. *Female* two, rarely three, egg-ſhaped, erect, rather remote, peduncled; peduncles about half as long again as the ſheaths; glumes egg-ſhaped, brown, ſomewhat membranous at the edge, never awned, with a pale obſcure nerve. *Fruit* longer than the glumes, browniſh-green, pointing upwards (not recurved), beaked, ſmooth, except at the edges of the beak, cloven at the top; ſtigmas three. *Seed* yellowiſh-brown, twice as large as that of C. flava. It is diſtinguiſhed from the next ſpecies by its rough ſtem, glumes without awns, and longer-beaked, rough-edged fruit. A native of marſhy ground, flowering in June and July. 120. C. *diſtans*, Linn. Sp. Pl. 33. Mart. 39. Lam. 47. Wahlen. 63. Flor. Dan. 1049. Eng. Bot. 1234. Sch. 87. tab. T. and Yy. fig. 68. (Hall. Helv. n. 1382. Rai Syn. 420. n. 16.) "Sheaths elongated, nearly as long as the peduncles; ſpikes oblong, very remote; glumes pointed; ſtem ſmooth." *Root* perennial, fibrous. *Stem* from 12 to 18 inches high, nearly upright, weak, bluntly triangular, or rather flattened on one ſide only, ſmooth, except ſometimes near the top. *Leaves* ſhort, rather broad, flat, rough at the edges. *Bractes* ſimilar to the leaves, remote; ſheaths moderately long, almoſt entirely concealing the peduncles. *Male ſpike* lanceolate, obtuſe; glumes inverſely egg-ſhaped, obtuſe, ſharply keeled, very ſlightly pointed. *Female ſpikes* two or three, ſeldom four, upright, oblong, egg-ſhaped, peduncled; lower peduncles half as long again as the ſheath, upper ones about its length; glumes broad, of a ruſty hue, tipped with a ſhort point; keel three ribbed. *Fruit* longer than the glumes, egg-ſhaped, brown, ſmooth, with many uniform ribs, and a ſhort cloven beak; ſtigmas three. *Seed* triangular, brown, appearing granulated, under a high magnifier. A native of marſhes, chiefly near the ſea, flowering in June. 121. C. *binervis*, Smith. Linn. Tranſ. vol. v. p. 268. Smith. Flor. Brit. 35. Eng. Bot. 1235. Wahlen. 97. (C. diſtans, Lightf. 561.) "Sheaths elongated, ſhorter than the peduncles; ſpikes cylindrical, remote, often compound; glumes pointed; fruit with two principal ribs." Larger than the preceding, for which it has been miſtaken by many botaniſts. *Stem* a foot and a half, ſometimes three feet high, erect, firm, bluntly triangular, ſmooth, except towards the top. *Leaves* upright, broadiſh, acuminate, rather glaucous, rough at the edges, and on the keel. *Bractes* reſembling the leaves, elongated, upright, remote, with rather long ſheaths. *Male ſpike* attenuated both ways, often an inch and half long; glumes denſely imbricated, elliptical, obtuſe, with a ſhort point, blackiſh; keel ſharp, green. *Female ſpikes* three or four, rarely five, cylindrical, erect; lower ones very remote, on longer peduncles, and often compound or branched at the baſe; all of them ſometimes with male flowers at the top; glumes egg-ſhaped, black, pointed; keel green, ſmooth, except at the point. *Fruit* longer than the glumes, egg-ſhaped, ſcarcely beaked, ſmooth, ſhining, purpliſh within and at the tip, pale without, with two principal green ribs, beſides ſeveral ſmall ones running longitudinally at ſome diſtance from the margin; ſtigmas three. Common in many parts of England and Scotland, but not generally underſtood, flowering in June. 122. C. *ſecalina*, Wahlen. 66. Willd. Schkuhr, tab. S. fig. 65. "Spikes broad lanceolate; peduncles ſheathed; bractes long, foliaceous, lower ones very remote; ſheaths ſhort; fruit oblong, with a long acuminate beak, convex on one ſide, a little concave on the other, preſſed cloſe, ſerrate-ciliated at the edges; orifice bifid; ſtigmas three." A native of Auſtria. 123. C. *heteroſperma*, Wahlen. 67. "Spikes ſomewhat thread-ſhaped, ſtraight; flowers ſcattered; peduncles ſheathed; bractes foliaceous, long, remote; fruit oval-ventricoſe, elongated at the baſe, attenuated at the top, curved outwards; orifice quite entire; ſtigmas three." A native of North America. 124. C. *juncea*, Mart. 91: Scop. Carn. n. 1163. Mich. Gen. 58. n. 19. "Spikes very remote; male longer than the females, which are nearly ſeſſile; fruit cloven, triangular, ſmooth; ſeed triangular." *Stem* a foot high. *Leaves* ſcarcely two lines broad. Upper female ſpike ſometimes with male flowers at the tip; lower with a leaf longer than the ſpike. 125. C. *panicea*, Linn. Sp. Pl. 30. Mart. 35. Lam. 57. Wahlen. 96. Schkuhr 93. tab. L l. fig. 100. Eng. Bot. 1505. "Sheaths elongated, about half the length of the peduncles; female ſpikes rather looſe, diſtant; fruit inflated; ſtem ſmooth." *Root* perennial, creeping. *Stem* from 10 to 15 inches high, erect, obtuſely triangular, ſmooth. *Leaves* glaucous, ſhort, rather erect, rough at the edges and top of the keel. *Bractes* foliaceous, acute, ſhorter than the ſtem; ſheaths long, furrowed, pale, or yellowiſh. *Male ſpikes* one or two, lanceolate, acute, denſe; glumes ruſty brown, obtuſe, various in breadth, with a green keel. *Female ſpikes* generally two, ſometimes with male flowers at the top, remote, erect, on ſlender peduncles twice as long as the ſheaths; glumes looſely imbricated, egg-ſhaped, ruſty brown, acute, awnleſs, membranous at the edge, with a green keel; ſtigmas three. *Fruit* egg-ſhaped, longer than the glumes, inflated, bluntiſh, entire, ſmooth, obſcurely ribbed, of a light greeniſh, or yellowiſh hue. *Seed* ſhort, triangular, brown, frequently infeſted with the diſeaſe called ſmut, which turns it into ſooty duſt. Dr. Smith. A native of moiſt ground, flowering in May and June. 126. C. *recurva*, Mart. 70. Hudſon p. 413. 2. Ed. Flor. Dan. 105. Eng. bot. 1506. (C. glauca; Scop. Carn. v. 2. 223. Pollich v. 2. 594. C. limoſa β; Leers 201. tab. 15. fig. 3. C. flacca; Wahlen. 115. Schreb. Schkuhr 98. tab. O. P. fig. 57. a. b. Gram. cyp. foliis caryophyllis, ſpicis pendulis; Rai Syn. p. 418. n. 5. Moriſ. §. 8. tab. 12. fig. 14.) "Sheaths ſhort; female ſpikes cylindrical, pendulous; fruit elliptical, triangular, roughiſh; root creeping." *Root* perennial, ſheathed with brown ſcales. Whole herb glaucous. *Stem* from eight to eighteen inches high, erect, convexly triangular, rough upwards. *Leaves* ſhorter than the ſtem, erect, broadiſh, flat, rough-edged. *Bractes* foliaceous, erect, nearly as long as the ſtem; ſheaths ſhort, with a ſmall appendage on each ſide. *Male ſpikes* various, moſtly ſolitary, ſometimes two perfectly diſtinct and both peduncled, when ſolitary often compound, with one or two ſpikelets, ſeſſile at its baſe; glumes inverſely egg-ſhaped, blunt, brown with a pale keel. *Female ſpikes* two or three; ſometimes with male flowers at the top, the upper one ſometimes nearly ſeſſile, the next on a longiſh peduncle, the loweſt often on a very long one ſpringing from the very bottom of the ſtem, all at firſt erect, afterwards pendulous, cylindrical, very denſe; glumes egg-ſhaped, ſomewhat pointed, blackiſh, with a white edge and yellowiſh nerve; ſtigmas three. *Fruit* imbricated, elliptical, bluntly triangular, ſwelling, entire, more or leſs downy or rough, of a ruſty green, ſoon becoming black. *Seed* ſhort, triangular. Common on moiſt ground, flowering in May and June. 127. C. *uſtulata*, Wahlen. 92. (C. atrofuſca; Schkuhr 90. tab. Y. fig. 82.) "Spikes oval; peduncles naked, curved backwards; bractes looſely ſheathing, ſcarcely foliaceous, diſtant; fruit oval, acuminate, flattiſh on both ſides, acutely angular, beaked, black; orifice two-toothed; ſtigmas three; male ſpike oblong, recurved. A native of mountains in Sweden, and Iceland. 128. C. *latifolia*, Wahlen. 94. Schkuhr 78. tab. M. fig. 49. "Spikes very narrow, rather looſely flowered; peduncles partly naked; bractes ſcarcely foliaceous, remote; ſheaths very long; fruit elongate-egg-ſhaped, triangular, curved outwards at the tip, quite entire; ſtigmas three, leaves very broad. A native of Virginia, in the herbarium of Thunberg. 129. C. *piloſa*, Wahlen. 95. Schkuhr 78. tab. M. fig. 49. "Spikes linear, looſely flowered; peduncles naked; bractes ſheathing, foliaceous, remote; fruit ſomewhat oval, acute; orifice tranſparent, two-lobed; ſtigmas three; leaves ciliated." A native of Moravia. 130. C. *limoſa*. Linn. Sp. Pl. 27. Mart. 32. Lam. 43.? Smith 27. Gooden. 34. Wahlen. 122. Schkuhr tab. T t. fig. 107. Flora dan tab. 646. (Cyperoides ſpica pendula, breviore, ſquamis e ſpadiceo vel fuſco rutilante viridibus; Scheuchz. Agr. 443. tab. 13. fig. 13.) "Sheaths very ſhort, ſcarcely any; female ſpikes egg-ſhaped, pendulous; fruit elliptical, compreſſed; root creeping." Dr. Smith. *Root* perennial, throwing out ſuckers; fibres cloathed with a thick down. Whole herb rather glaucous. *Stems* aſcending, ſcarcely a foot high, triangular, ſtriated, rough, leafy at the baſe. *Leaves* linear, narrow, flat, ſhorter than the ſtem, rough at the edges, ſheathed at the baſe with brown ſcales. *Bractes* erect, reſembling the leaves but ſmaller; ſheaths brown, ſlightly emarginated, membranous and white at the edge. *Male ſpike* terminal, erect, lanceolate, reddiſh brown; glumes egg-ſhaped, acute." *Female* one or two, peduncled, drooping, finally pendulous, egg-ſhaped, many-flowered, denſe, handſome; glumes broadly elliptical, ſomewhat pointed, green at the back, deep gold-coloured at the edge; peduncles very long, triangular, ſmooth. *Fruit* imbricated, a little longer than the glume, elliptical, compreſſed, ribbed, ſmooth, entire, ſcarcely beaked; ſtigmas three. *Seed* elliptical, triangular, a little compreſſed, brown. A native of turfy bogs in England, and other parts of Europe. 131. C. *laxa*, Wahlen. 93. "Spikes oblong-elliptical, rather denſely flowered, pendulous; peduncles naked; bractes foliaceous, rather narrow, remote; ſheaths rather long; glumes obtuſe, as long as the fruit; fruit oblong-elliptical, rather obtuſe, triangular, depreſſed; angles obtuſe; orifice very entire; ſtigmas three; ſtem flaccid. A native of the turfy borders of lakes in Lapland. Female ſpikes ſimilar to thoſe of the preceding ſpecies. 132. C. *cæſpitoſa*, Linn. Sp. Plan. 34. Mart. 38. Smith 42. Wahlen. 139. Eng. bot. 1507. Schkuhr 48. tab. B b. fig. 85. c. d. (Gram. caryophylleum; Dill. in Rai Syn p. 418. n. 6.) "Digynous; bractes auricled, not ſheathing; ſpikes ſeſſile, cylindrical, obtuſe; fruit permanent." *Root* creeping, but ſhort, forming denſe, entangled tufts. *Stems* from nine to twelve inches high, erect, acutely triangular, roughiſh upwards. *Leaves* erect, almoſt as tall as the ſtem, narrow, acute, of a bright not glaucous green, rough at the edges and keel. *Bractes* like the leaves, but much ſmaller, without any ſheath, accompanied at the baſe by a pair of round black auricles, which are largeſt in the ſmaller bractes. *Male ſpike* almoſt always ſolitary, lanceolate, erect; glumes brown, obtuſe, narrowiſh, with a green nerve. *Female ſpikes* two or three; crowded, ſeſſile, erect, cylindrical, ſhortiſh, obtuſe; glumes elliptical, obtuſe, cloſe, black, with a green nerve. *Fruit* elliptical, broad, compreſſed, ribbed, green, ſmooth, permanent after it is ripe; ſtigmas two. *Seed* compreſſed. Dr. Smith. A native of moiſt ground in Sweden and England. 133. C. *ſtricta*, Mart. 83. Gooden. 40. Linn. Tranſ. V. 2. tab. 21. fig. 9. Smith 43. Wahlen. 138. Schkuhr 49. tab. V. fig. 73. (C. cæſpitoſa; Hudſ. p. 412. Lightf. 561. β. C. acuta, and Leers 204. tab. 16. fig. 1. Hall. helv. n. 1400. on the authority of Davall. C. elata; Mart. 86. Allion. pedem. n. 2344. Gram. cyper. Rai Syn. p. 418. n. 4. Loeſ. Pruſſ. 116. tab. 30.) "Digynous; bractes ſlightly auricled, not ſheathing; ſpikes nearly ſeſſile, cylindrical, elongated, acute; fruit deciduous." *Root* perennial, creeping. Whole herb rather glaucous, double the ſize of the preceding. *Stem* about two feet high, erect, ſharply triangular; rough upwards. *Leaves* erect, ſtraight, ſhorter than the ſtem, rough on the edges and keel; root-leaves embracing the ſtem, with ſheaths ſplit into threads after the manner of open network. *Bractes* ſimilar to the leaves, ſeſſile, erect, ſtraight, accompanied at the baſe by two oblong auricles which ſoon diſappear; ſheath none. *Spikes* on ſhort peduncles, erect, an inch and half or two inches long, linear-lanceolate, rather near together, very denſe, many-flowered; all the glumes elliptic-lanceolate, obtuſe, preſſed cloſe, black, with a green nerve; male ſpikes often two; females generally three, often with male flowers at the top; ſtigmas two. *Fruit* imbricated, egg-ſhaped, acute, compreſſed, ribbed, green, ſmooth, deciduous as ſoon as ripe. *Seed* ſimilar to that of the preceding ſpecies. A native of marſhy places in various parts of Europe. 134. C. *japonica*, Mart. 40. Lam. 51. Thunb. flor. japon. 38. "Spikes monoicous, peduncled, erect; female ones peduncled, egg-ſhaped; male terminal, linear." *Root* fibrous. *Stem* about ſeven inches high, leafy, triangular, erect, weak, ſmooth. *Leaves* alternate, ſheathing, ſmooth, erect; lower ones ſhorter than the ſtem; upper ones over-topping it. *Male ſpike* terminal, linear, longer than the others. *Female ſpikes* two or three, erect, egg-ſhaped, furniſhed with bractes. A native of the iſland of Niphon; flowering in June. La Marck juſtly obſerves, that from this deſcription the ſpikes are improperly ſaid to be monoicous. 135. C. *plantaginea*, Lam. 49. "Male ſpike ſhort, dark purple; female ſpikes remote, erect, ſlender; ſtem ſheathed, leaves ribbed." *Root-leaves* in thick tufts, oblong-lanceolate, flat, about an inch broad, ribbed like thoſe of plantane, purple at their baſe. *Stems* ſlender, ſtraight, jointed, higher than the leaves, and furniſhed in all their length with numerous alternate, naked, pointed, purple ſheaths, of which only the lower terminate in ſhort leaves. *Male ſpike* more than half an inch long, terminal, oblong-egg-ſhaped, ſtraight, nearly black or dark purple; glumes ſmooth, oblong-egg-ſhaped. *Female ſpikes* four or five, ſtraight, very ſlender, diſtant from each other, on ſhort peduncles which are partly concealed by the ſheath; glumes looſely imbricated, ſmooth, membranous, acuminate, purpliſh at the tip. Suppoſed to be a native of South America; cultivated in the open air at Paris, where it flowers early in the ſpring. 136. C. *laxiflora*, Lam. 50. "Female ſpikes filiform, axillary, erect; flowers diſtant; leaves flat." *Stems* in a tuft, from ſeven to nine inches high, leafy. *Leaves* alternate, ſtraight, flat, like thoſe of juncus piloſus, ſmooth, two or three lines broad; root-leaves ſhorter than the others. *Male ſpike* terminal, ſtraight, pale or yellowiſh, ſcarcely an inch long; glumes lanceolate-egg-ſhaped, membranous. *Female ſpikes* three, an inch long, alternate, axillary, ſtraight, filiform, peduncled; glumes alternate, diſtant, mucronate, membranous, whitiſh. A native of New York, Pennſylvania, and Virginia. 137. C. *praſina*, Wahlen. 118. "Spikes on rather ſhort peduncles, linear, elongated at the baſe, looſe; bractes partly embracing the ſtem, foliaceous, rather diſtant; glumes oval-elliptical, mucronate; fruit oblong, depreſſed, pointed; orifice two-toothed; ſtigmas three; ſtem acutely angular." A native of North America. 138. C. *leonura*, Wahlen. 120. "Spikes peduncled, ſlender, and tapering, zig-zag, nodding; bractes partly embracing the ſtem, foliaceous, diſtant, very long; glumes with a long diverging awn, fruit ſomewhat globular, pointed; orifice quite entire; ſtigmas three." A native of Pennſylvania. 139. C. *Chinenſis*, Wahlen. 88. Mart. 93. Lam. 54. Retz. Obſ. Faſc. iii. p. 42. "Spikes erect; male terminal; female four, peduncled; fruit acuminate." *Stem* ſeven or eight inches high, triangular, ſmooth. *Leaves* longer than the ſtem, rough at the edges. *Female* ſpikes reſembling thoſe of the next ſpecies, but are upright, remote, ſolitary, more ſlender, and are each furniſhed with a ſlender bracte ſcarcely the length of the ſpike. A native of China. 140. C. *pſeudo-cyperus*, Linn. Sp. Pl. 32. Mart. 37. Lam. 53. Wahlen. 117. Smith 26. Eng. Bot. tab .242. Schkuhr 25. tab. M m. fig. 102. (Gram. Cyper. p. 419. n. 12. Moriſ. § 8. tab. 12. fig. 5.) "Bractes ſcarcely ſheathing; ſpikes cylindrical, pendulous, many-flowered; fruit ſpreading, furrowed, beaked, cloven." *Root* perennial, fibrous. *Stem* a foot high or more, erect, leafy, ſharply triangular; rough at the angles. *Leaves* pale green, ſheathing, rough above, and at the edges. *Bractes* leſs than the leaves, and ſcarcely ſheathing. *Peduncles* very long, triangular, ſlender, rough, ſometimes two from a bracte. *Spikes* cylindrical, many-flowered, denſe; male erect, red; female about four, on peduncles about their own length, greeniſh, at firſt erect, but ſoon pendulous; glumes egg-ſhaped, with long, very rough awns. *Fruit* ſpreading, lanceolate, triangular, ribbed, ſmooth, beaked, cloven; ſtigmas three. *Seed* elliptical, triangular, white. Not very uncommon in wet ſhady places, flowering in June. 141. C. *crinita*, Lam. 55. "Spikes long, briſtly, rather pendulous; glumes briſtly, ſeveral times longer than the fruit." *Stem* about two feet high, triangular, leafy. *Leaves* ſtriated, long, three or four lines broad; upper ſtem ones longer than the ſtem. *Spikes* about five; male an inch and an half long, terminal, linear, with ſometimes a few female flowers at the baſe; glumes narrow, linear-awl-ſhaped, yellowiſh or reddiſh; females near three inches long, alternate, axillary, peduncled, drooping; glumes very narrow, linear-briſtle-ſhaped, ciliated, ſpreading, much longer than the fruit. *Fruit* roundiſh-egg-ſhaped, ſmooth, angular, ſlightly mucronate. A native of Virginia. 142. C. *Micheli*, Wahlen. 89. Hoſt. Schkuhr 84. tab. P. and V v. fiſ. 59. (C. ampullacea, Wulfen.) "Spikes thickiſh, ſhort; peduncles ſheathed; bractes ſomewhat foliaceous, rather remote; glumes acuminate, as long as the fruit; fruit broad, inverſely egg-ſhaped, with a rather long bicuſpidate beak; ſtigma three." A native of Moravia. 143. C. *xanthophyſa*, Wahlen. 73. "Spikes ſix-flowered, very thick; peduncles ſomewhat ſheathed; bractes foliaceous, very remote; fruit oblong-conical, inflated, beaked, diverging; orifice bifid; ſtigmas three. A native of North America. 144. C. *folliculata*, Linn. 31. Mart. 36. Wahlen. 74. Schkuhr 73. tab. N. fig. 52. Linn. Tranſ. vol. vii. tab. 9. fig. 4. (Gram. Cyp. Pluk. Mant. 96. tab. 419. fig. 1.) "Spikes terminal, peduncled, male and female; fruit awl-ſhaped, the length of the ſpike." *Stem* two feet high, triangular. *Leaves* narrow. *Male ſpike* terminal, oblong, peduncled, accompanied in the ſame axil by a female ſpike, conſiſting of ſeven or eight conic-awl-ſhaped, ſpreading, ſeed-veſſels each as long as the ſpike itſelf, big with the ſeed, Linn. The figure in the Linnæan Tranſactions, taken from a ſpecimen in the poſſeſſion of Mr. Rudge, and correſponding with one in the herbarium of ſir Joſeph Banks, has two female ſpikes, as has alſo Plukenet's figure, quoted by Linnæus. Found by Kalm in Canada. 145. C. *intumeſcens*, Rudge in Linn. Tranſ. vol. vii. p. 97. tab. 9. fig. 3. (C. folliculata, Lam. 48? C. lurida, Wahlen.) "Female ſpikes few-flowered; fruit inflated, egg-ſhaped, with a long pointed beak." *Stem* erect, triangular; angles rather obtuſe, ſmooth, but rough above the lower bracte. *Leaves* longer than the ſtem, broad, dark green, rough at the edges and on the keel. *Male ſpikes* terminal, linear, on a long peduncle. *Female ſpikes* with looſely imbricated flowers on very ſhort peduncles; glumes oblong-egg-ſhaped, acute, half the length of the fruit. *Fruit* oblong-egg-ſhaped, much inflated, erect, ſtriated, with a long acute beak, cloven at the orifice; ſtigmas three. *Seeds* egg-ſhaped, triangular, ſmooth, acuminate, yellow. A native of Carolina. 146. C. *pendula*, Mart. 87. Hudſ. p. 411. Gooden. 20. Smith 21. Curtis Flor. Lond. tab. 63. Schkuhr 85. tab. Q. fig. 60. (C. agaſtachys, Linn. jun. Supp. 414. Ehrt. Phyt. n. 19. Wahlen. 76. C. maxima, Lam. 56. Scop. Carn. ii. n. 1166. Allion. Flor. Ped. n. 2341. Hall. Helv. n. 1396. Gram Cyper. Rai Syn. p. 420. n. 13. Moriſ. § 8. tab. 12. fig. 4. Barel. Icon. tab. 45.) "Sheaths elongated, nearly the length of the peduncle; ſpikes cylindrical, very long, nodding; fruit crowded, egg-ſhaped, acute." *Root* perennial, fibrous. *Stem* from three to ſix feet high, erect, firm, leafy, ſmooth, triangular; angles roughiſh towards the top. *Leaves* broad, deep green, rigid, hard, rough at the edges and on the keel, rather glaucous underneath. *Bractes* foliaceous; lower ones very long, hanging down in a curve, ſheathing; ſheaths nearly the length of the peduncles. *Spikes* from five to ſeven, peduncled, curvilineally pendulous, cylindrical, many-flowered, very denſe; the higheſt male, ſometimes with female flowers at the top; the reſt commonly female; glumes lanceolate, acuminate, brown, with a green keel. *Fruit* egg-ſhaped, triangular, rather inflated, ſmooth, beaked, at length emarginate; ſtigmas three. *Seed* triangular, brown. A native of woods and moiſt hedges in many parts of Europe, flowering in May and June. 147. C. *ſtrigoſa*, Mart. 88. Hudſ. p. 411. Gooden. 21. Smith 22. Eng. Bot. 994. Schkuhr 30. tab. N. fig. 53. (C. leptoſtachys, Mart. 92. Linn. Sup. 414. Ehrt. Phyt. n. 48. Wahlen. 68. Gram. Cyper. Rai Syn. p. 419. n. 11.) "Sheaths elongated, nearly equal to the peduncle; ſpikes filiform, looſe, a little drooping; fruit lanceolate, triangular, ribbed." *Root* perennial, fibrous. *Stem* two feet high, erect, ſlender, leafy, triangular, ſmooth. *Leaves* light green, broadiſh, thin, rough on the edges and keel. *Bractes* like the leaves, ſhorter than the ſtem; ſheath nearly as long as the peduncle, crowned by a tubular membrane. *Spikes* ſix or eight, peduncled; the higheſt male, the reſt female; glumes lanceolate, greeniſh. *Fruit* lanceolate, triangular, acute, ribbed, ſmooth, green; ſtigmas three. *Seed* elliptical, triangular. A native of woods and hedges in ſeveral parts of England, but not common, flowering in April and May. 148. C. *ſylvatica*, Mart. 89. Hudſ. p. 411. Gooden. 31. Smith 23. Flor. Dan. 404. Eng. Bot. 995. Schkuhr 94. tab. L l. fig. 101. (C. veſicaria, β. Sp. Pl. C. drymeia, Linn. jun. Sup. p. 414. Ehrt. Phyt. n. 58. Wahlen. 79. C. patula, Lam. 45. Pollich. v. ii. 597. C. capillaris, Leers 202. tab. 15. fig. 2. Hall. Helv. n. 1395. Gram. Cyper. Rai Syn. p. 419. n. 10. Moriſ. § 8. tab. 12. fig. 9.) "Sheaths half the length of the peduncle; ſpikes ſlender, a little looſe, drooping; fruit egg-ſhaped, triangular, beaked." *Root* perennial, fibrous. *Stem* two or three feet high, erect, leafy, ſmooth, convexly triangular. *Leaves* bright green, rough above, very rough on the edges and keel. *Bractes* like the leaves, with longer ſheaths. *Spikes* ſix or eight, ſoon drooping, ſlender, rather looſe; one, rarely two, male; all with ſlender peduncles more than half the length of the ſheath; glumes egg-ſhaped, acuminate, membranous, white, with a rough green keel. *Fruit* egg-ſhaped, triangular, with a long beak, ſmooth, emarginate at the tip; ſtigmas three. *Seed* triangular, brown. It is diſtinguiſhed from the preceding by the ſtructure of its fruit, which has three prominent angles, but no intermediate ribs, and ends in a long cloven beak. Linnæus made it only a variety, and has celebrated its utility to the Laplanders, who uſe it carded and dreſſed as a wadding to protect them from cold. Common in woods and thickets, flowering in May or June. 149. C. *depauperata*, Mart. 85. Gooden. 30. Wahlen. 86. Smith 24. Eng. Bot. 1098. (C. ventricoſa, Curt. Flor. Lond. tab. 68. C. triflora, Willd. Phytog. tab. 1. fig. 2. Cyperoides, Moriſ. tab. 32. fig. 5. C. veſicarium humile, locuſtis rarioribus, Tourn. Inſt. 130. confirmed by his herbarium.) "Sheaths much ſhorter than the peduncles; female ſpikes diſtant, erect, few-flowered; fruit inflated, beaked." *Root* perennial, fibrous. *Stem* a foot and half high, erect, leafy, obſcurely triangular, ſtriated, ſmooth. *Leaves* with long ſheaths, pale green, rough on the edges and keel. *Bractes* like the leaves, but with ſhorter ſheaths which cloſely unfold the ſlender peduncles of the female ſpikes, ſometimes for a third part of their length, and ſometimes for more than half. *Male ſpike* terminal, erect, many-flowered, linear, cloſely imbricated; glumes elliptical, ruſt-coloured, with a white membranous edge and a green keel. *Female ſpikes* from three to five, remote, looſe, erect; peduncles triangular, rough; flowers from two to four or five, erect; glumes inverſely egg-ſhaped, pointed, with a green keel. *Fruit* egg-ſhaped, triangular, ribbed, ſmooth, rather long-beaked, with a membranous nearly entire orifice, finally becoming inflated; ſtigmas three. *Seed* inverſely egg-ſhaped, triangular. A native of woods but rare, flowering in May and June. 150. C. *griſea*, Wahlen. 129. "Spikes on naked peduncles, with ſix looſely-ſet flowers; bractes ſheathing, long, foliaceous, very remote; glumes cuſpidate; fruit oblong-oval, triangular, rather acute; orifice quite entire; ſtigmas three. Native country unknown; preſerved in the herbarium of Swartz. 151. C. *valeſiaca*, Wahlen. 87. Suter Flor. helv. 2. n. 57. Schkuhr tab. B b b. fig. 117. "Spikes two-flowered at the baſe, male at the top; peduncles long, naked, flaccid; bractes ſheathing, long, foliaceous, remote; the loweſt radical; fruit broad, inverſely egg-ſhaped, roundiſh, ending in a point; ſtigmas three; male ſpike flaccid; leaves narrow." A native of Switzerland. 152. C. *capillaris*, Linn. Sp. Pl. 28. Mart. 33. Lam. 44. Smith 25. Wahlen. 91. Schkuhr 82. tab. O. fig. 56. Flor. Dan. 168. Scop. Carn. tab. 59. (Cyperoides alpinum; Seguier. Veron. vol. 3. tab. 3. fig. 1.) "Sheaths half the length of the peduncles; female ſpikes egg-ſhaped, rather looſe, drooping; fruit acuminate." *Root* perennial, fibrous. *Stem* erect, from three to five inches high, roundiſh, ſlender, ſtriated, ſmooth. *Root-leaves* ſometimes not half the length of the ſtem, narrow, acute, flattiſh, rough on the edges towards the tip. *Male ſpike* erect, linear, of a ſilvery-brown colour, with about ten flowers. *Female ſpikes* two or three, nodding or pendulous, egg-ſhaped, ſhort, with fewer flowers; all the glumes egg-ſhaped, brown, membranous and white at the tip. In an early ſtage of the infloreſcence, all the ſpikes ſeem to proceed almoſt in an umbellate form from the ſheath of a common bracteal leaf which involves half the length of the peduncles; but as the fructification advances, the ſtem elongates and each appears with its proper, but ſhorter, bracteal leaf and ſheath. In this ſtate it is figured in Flora Danica. *Fruit* egg-ſhaped, triangular, acuminate, a little inflated; ſtigmas three. *Seed* elliptical, acutely triangular. A native of mountains in Scotland and other parts of Europe, flowering in July and Auguſt. 153. C. *caſtanea*, Wahlen. 90. "Spikes thickiſh, ſhort, rather denſely flowered; peduncles long, naked, curved backwards; bractes looſely ſheathing, foliaceous, diſtant; glumes ſhort; fruit oblong, attenuated, ſomewhat diverging; orifice one-lobed; ſtigmas three; leaves hairy." A native of North America, preſerved in the herbarium of Turner. 154. C. *flexilis*, Rudge. Linn. Tran. vol. 7. p. 98. Tab. 10. fig. 1. "Female ſpikes oblong-egg-ſhaped, pendulous; fruit egg-ſhaped, beaks acuminate." *Stem* feeble, triangular, ſmooth. *Leaves* ſhorter than the ſtem, erect, thin, hairy at the edges and on the keel. *Male ſpike* near an inch long, terminal, erect, ſlender. *Female ſpikes* three or four, on long peduncles, oblong-egg-ſhaped, finally pendulous, two near the ſummit of the ſtem; the others remote with longer bracteal leaves; glumes ſhorter than the fruit, egg-ſhaped, acute, hairy at the edge. *Fruit* oblong-egg-ſhaped, beaked, cloven; ſtigmas three, glandular. *Seeds* egg-ſhaped, triangular, ſmooth. A native of Newfoundland. 155. C. *tenuis*, Rudge in Linn. Tranſ. vol. 7. p. 97. tab. 9. fig. 2.) "Female ſpikes filiform, looſe, pendulous; fruit oblong, with a long-pointed beak." *Stem* ſlender, feeble, triangular, angles not rough. *Leaves* longer than the ſtem, pale green, hiſpid at the edges. *Male ſpike* terminal, erect, linear. *Female ſpikes* zig-zag, about four, three near the top of the ſtem, the other remote; peduncles capillary; glumes oblong, ſmooth, acute, half the length of the fruit. *Fruit* oblong, with a long, ſlender, cloven beak; ſtigmas three. 156. C. *acuta*, Linn. Sp. Pl. 35. Mart. 41. Gooden. 43. Smith 44. Wahlen. 136. Schkuhr 50. tab. F f. fig. 92. b. (C. gracilis, Curt. Flor. Lond. tab. 62. Mart. 96. C. verna α; Lam? Gram. cyperoides majus anguſtifolium; Rai Syn. p. 417. n. 2.) "Digynous; ſpikes filiform; drooping in flower, erect in fruit; fruit elliptical, obtuſe, entire at the orifice." *Root* perennial, creeping far. *Stem* varying in length with the moiſture of the ſituation, ſometimes two feet high and more, drooping at the ſummit when in flower, afterwards becoming erect, acutely triangular; angles rough. *Leaves* bright green, erect, curved near the tip, rough on the edges and keel. *Spikes* nearly ſeſſile, filiform, ſlender, elongated, denſe, many-flowered; glumes oblong, acute, awnleſs, black with a white nerve; male ſpikes two or three; female three or four, often with female flowers at the top, the lower ones at length becoming peduncled; ſtigmas two, white. *Fruit* imbricated, elliptical, obtuſe, compreſſed, ribbed, green, ſmooth, deciduous. *Seed* ſmall, inverſely egg-ſhaped, double-keeled, not triangular. Common on the banks of ditches and rivers, flowering in May. 157. C. *paludoſa*, Gooden. 42. Smith 45. Eng. bot. 807. Wahlen. 127. Schkuhr 101. tab. O o. fig. 103. (C. acuta, Curt. Lon. tab. 61. Hudſ. γ. Lightf. β. verna γ. Lam? Gram. cyperoides minus anguſtifolium, Dill. in Rai Syn. p. 418.) "Spikes cylindrical, rather obtuſe, erect; the female with awn-pointed glumes; the male with blunt ones; fruit elliptical, emarginate." *Root* perennial, creeping far. Whole herb glaucous. *Stem* a foot and half or two feet high, erect, acutely and irregularly triangular; angles very rough. *Leaves* rather broad, erect, rough on the margin and keel. *Bractes* foliaceous, not ſheathing, rarely auricled, ſometimes longer than the leaves. *Spikes* cylindrical, bluntiſh, erect; male about three; glumes oblong, blunt, brown, ſhining, with a green keel; female about three, on ſhort peduncles, often with male flowers at the top; glumes lanceolate, acute, often with a rough awn, brown, with a green keel; ſtigmas three. *Fruit* imbricated, elliptic-lanceolate, rather acute, ribbed, finally emarginate. *Seed* triangular. Common on the banks of rivers and ditches, flowering in May. 158. C. *riparia*, Curt. Flor. Lond. tab. 60. Gooden. 41. Smith 46. Wahlen. 126. Eng. bot. tab. 579. Schkuhr 102. tab. Q q. fig. 105. (C. acuta, Hudſ. Lightf. C. rufa, Lam. 58. Cyperoides aquaticum maximum; Mich. gen. 57. n. 10. 11. tab. 32. fig. 67. Gram. cyper. cum paniculis nigris; Rai Syn. 417. n. 1. Moriſ. tab. 12. fig. 1.) "Spikes erect; males triangular; females cylindrical; glumes of both acuminate; fruit beaked, forked at the tip." *Root* perennial, widely creeping, thick. *Stem* three feet high, erect, firm, acutely triangular; angles very rough, cutting like a fine ſaw. *Leaves* broad, erect, deep green above, a little glaucous underneath, rough on the edges and keel. *Bractes* foliaceous, longer than the ſtem, a little ſheathing; ſheaths often with rounded, pale auricles. *Male ſpikes* from three to five, erect, triangular, acute, dark brown; glumes lanceolate, acuminate or awned, brown; with a keel of the ſame colour. *Female ſpikes* three or four, erect, more or leſs peduncled, cylindrical, often with male flowers at the top; glumes egg-ſhaped, leſſening ſuddenly into a rough awn, brown with a paliſh keel; ſtigmas three. *Fruit* imbricated, rather ſpreading, egg-ſhaped, inflated, with many ribs and a ſhort cloven beak. *Seed* triangular, ſmall, white. Common on the banks of rivers, flowering in April and May. The laſt three ſpecies which appear to have been confounded by Linnæus and moſt other botaniſts, were firſt clearly diſtinguiſhed, and their ſpecific differences ſettled by Mr. Curtis. 159. C. *geminata*, Wahlen. 116. Schkuhr 53. tab. W. p. fig. 75. "Spikes in pairs, on long peduncles, cylindrical, pendulous; males ſeveral; bractes embracing the ſtem, foliaceous, long, diſtant; fruit ovate-globular, pointed; ſtigmas three." A native of New Zealand? Forſter. 160. C. *Micheliana*, Smith. Linn. Tranſ. vol. 5. p. 270. Flor. brit. 47. (Cyperoides, Mich. gen. 62. tab. 32. fig. 12.) "Spikes erect, cylindrical; female ones peduncled; all the glumes obtuſe, awnleſs; fruit inverſely egg-ſhaped, very obtuſe." *Stem* erect, a foot or a foot and half high, triangular, ſtriated, ſcarcely rough. *Leaves* erect, acuminate, rough at the edges, with a ſmoothiſh keel. *Bractes* foliaceous, erect, longer than the ſtem, ſcarcely ſheathing, auricled at the baſe; auricles large, rounded, connate, brown, pale at the tip. *Spikes* cylindrical, rather obtuſe, erect; *males* three or four, nearly ſeſſile, ſlender; glumes very obtuſe, awnleſs, glaucous-green, with a thin, membranous, white edge; *females* two, on long peduncles, rather thick, the upper one with male flowers at the top, the lower one ſometimes compound at the baſe; glumes elliptical, very obtuſe, awnleſs, brown, with a white membranous edge, and a yellowiſh blunt keel; ſtigmas three. *Fruit* much ſhorter than the glumes, inverſely egg-ſhaped, triangular, dilated, almoſt ribleſs, ſmooth, greeniſh, very blunt at the top, undivided. *Seed* triangular, ſhort, brown, with pale angles, reſembling that of C. recurva, to which it is nearly allied, but differs in its numerous male ſpikes, and in its fruit, which is very ſmooth, ſhorter than the glumes, compreſſed, and not at all gibbous. Found by profeſſor James Beattie jun. near Aberdeen: before that time it had been obſerved only by Micheli, whoſe figure had long been a ſtumbling block to botaniſts. It has been found ſince in Yorkſhire near Beverley and Ripon. 161. C. *lævigata*, Smith. Linn. Tranſ. vol. v. p. 272. Flor. brit. 48. Eng. bot. 1387. Wahlen. 80. (C. patula, Link. Schkuhr 97. tab. B b b, fig. 116. C. æthiopica, Schkuhr 91. tab. Z. fig. 83.) "Spikes cylindrical; female one peduncled; ſheaths very long; glumes pointed; fruit triangular, with a cloven beak." *Root* perennial, fibrous. *Stem* erect, from two to four feet high, triangular, perfectly ſmooth, leafy below. *Leaves* erect, broadiſh, bright green, ſmooth, with long ſheaths. *Bractes* foliaceous, erect, higher than the ſtem, acuminate, the upper ones rough at the edges, lower ones only at the tip; ſheaths of the lower ones very long, but ſhorter than the peduncles; of the upper ones ſometimes very ſhort. *Spikes* cylindrical, elongated, acute, ſlender, erect; males often two, glumes lanceolate, acute, often pointed; females two or three, on long, capillary, very ſmooth peduncles; glumes lanceolate, pointed, ruſt-coloured, green on the back, rough at the point; ſtigmas three. *Fruit* longer than the glumes, lanceolate, triangular, a little ſpreading, ribbed, not inflated, green, ſmooth; leſſening into a compreſſed, deeply cloven beak. *Seed* filling the tunic, triangular, ſhort, brown, pedicelled. Firſt found in Great Britain by Mr. Mackay, near Glaſgow. It has ſince been gathered in various parts of England and Wales. Schkuhr had it from the Iſle of Bourbon, and therefore named it, but as Dr. Smith obſerves, not happily, æthiopica. 162. C. *trifida*, Wahlen. 123. Cavanilles Icon. vol. v. tab. 465. "Spikes nearly ſeſſile, ſomewhat lanceolate, very thick; males ſeveral; bractes partly embracing the ſtem, foliaceous, broad and long, rather diſtant; glumes rather long, truncate, retuſe, with a long ciliated awn; fruit oblong-egg-ſhaped, two-toothed; ſtigmas three." A native of Falkland Iſlands. 163. C. *veſicaria*, Mart. 42. Lam. β. Linn. Sp. Pl. 36. Smith 49. Wahlen. 124. Flor. Dan. 647. Eng. bot. 779. Schkuhr 103. tab. S ſ. fig. 106. (C. inflata, Hudſ. Lightf. Gram. cyper. Dill. in Rai Syn. n. 14. Moriſ. tab. 12. fig. 6. "Female ſpikes cylindrical, ſhortiſh, nearly ſeſſile; ſheaths none; fruit inflated, beaked, cloven." *Root* perennial, creeping. *Stem* erect, two feet high, triangular, with very ſharp and rough angles. *Leaves* erect, bright green, narrow, acuminate, rough at the edges. *Bractes* foliaceous, higher than the ſtem, ſeſſile, without ſheaths. *Male ſpikes* from one to three, filiform, ſlender, acute; glumes linear-lanceolate, rather acute. *Female ſpikes* three or four, nearly ſeſſile, rather ſpreading, cylindrical, about an inch long, obtuſe; glumes lanceolate, or linear-lanceolate, acute, brown, with a green keel; ſtigmas three. *Fruit* thickly ranged in ſeveral rows, ſpreading, longer than the glumes, egg-ſhaped, acuminate, ribbed, inflated, very ſmooth, yellowiſh, and ſhining when ripe, cloven at the tip. *Seed* ſmall, triangular, ſhort, ſeſſile, crowned with the long permanent ſtyle, deprived of its ſtigmas. A native of marſhy ground, chiefly in mountainous countries, flowering in May. β. C. plumbea, Wahlen. "Spikes thick; bractes foliaceous, very long, a little remote; ſcales ovate-oblong, ending in a point longer than the fruit; fruit oval-ovate, acuminate; orifice forked." A native of Caucaſus, in the herbarium of Swartz. 164. C. *ampullacea*, Mart. 97. Gooden. 45. Smith 50. Wahlen. 125. Schkuhr 104. tab. T t. fig. 107. (C. veſicaria, Lam. 59. α. Hudſ. Lightf. C. roſtrata, Dr. Stokes in Withering Ed. 2. Sibthorp. Abbot. Gram. cyp. Rai Syn. p. 419. n. 9. Moriſ. tab. 12. fig. 8.) "Female ſpikes cylindrical, elongated, nearly ſeſſile; ſheaths none; fruit inflated, with a linear, cloven beak." *Root* perennial, creeping. *Stem* erect, ſometimes two feet high, triangular; angles ſmooth below, rough above the loweſt ſpike. *Leaves* erect, narrow, glaucous, acute, rough at the edges and on the keel near the tip. *Bractes* foliaceous, erect, narrow, the loweſt often overtopping the ſtem; ſheaths none. *Male ſpikes* two or three, rather remote, filiform, acute; glumes elliptic-lanceolate, blunt, brown, membranous at the edge, with a yellow keel. *Female ſpikes* two, rarely three, more than twice as long as thoſe of veſicaria, and much more ſlender, blunt, lower ones on ſhort peduncles; glumes more acute than thoſe of the male; ſtigmas three. *Fruit* imbricated, ſpreading, longer than the glumes, almoſt globular, inflated, ribbed, ſmooth, yellowiſh, with a linear cloven beak. *Seed* ſmall, elliptical, triangular, ſeſſile, tipped with the long ſtyle. Common in Scotland and the northern counties, more rare in the ſouth, flowering in May. 165. C. *rotundata*, Wahlen. 78. (C. globularis, Vahl. Schkuhr 71. tab. G g. fig. 93.) "Spikes on ſhort peduncles, oval; bractes ſomewhat foliaceous, diſtant; ſheaths very ſhort; glumes nearly as long as the fruit, obtuſe; fruit ſomewhat globular, ſhining, acuminate, ſomewhat two-lipped; ſtigmas three; ſtem round; leaves convolute." A native of ſub-Alpine mountains in Lapland. 166. C. *pumila*, Mart. 44. Lam. 43. (Wahlen. 71. Thunb. Flor. Jap. 39. Schkuhr tab. Y y. fig. 112.) "Male ſpikes two, terminal, ſeſſile; female two, peduncled, oblong, erect." *Stem* very ſhort, ſcarcely any. *Leaves* linear, attenuated, convolute, ſmooth. *Male ſpikes* linear; the lower one half the length of the other. *Female ſpikes* ſmooth. *Fruit* ſmooth, inflated, egg-ſhaped, beaked; ſtigmas three. Scarcely to be diſtinguiſhed from C. veſicaria, except by its almoſt total want of a ſtem, the ſpikes appearing to riſe directly from the ſurface of the ground. A native of Japan. 167. C. *hirta*, Linn. Sp. Pl. 37. Mart. 43. Lam. 61. Wahlen. 70. Smith 51. Eng. bot. 685. Schkuhr 105. tab. U u. fig. 108. (Gram. cyper. Rai Syn. p. 418. n. 7. Moriſ. tab. 12. fig. 10.) "Hairy; ſpikes ſhort, cylindrical, remote, ſheaths nearly as long as the peduncle; glumes awned; fruit hairy." *Root* perennial, creeping far, with downy fibres. *Stem* about two feet high, acutely triangular; angles rough. *Leaves* ſcarcely ſo tall as the ſtem, erect, flat, acuminate, moſt hairy underneath, rough at the edges; ſheaths long, generally very hairy upwards, but in watery places they ſometimes become ſmooth. *Bractes* like the leaves, as long as the ſtem; ſheaths hairy, incloſing nearly the whole peduncle. *Male ſpikes* two, rather remote, unequal in ſize, lanceolate; glumes egg-ſhaped, pointed, brown, hairy on the outſide, with a yellow keel. *Female ſpikes* three, remote, peduncled, erect, cylindrical, ſhort, rather looſe; glumes ſmooth, egg-ſhaped, with long awns, a broad membranous white edge and green keel. *Fruit* looſely imbricated, egg-ſhaped, acute, ribbed, hairy on both ſides, ſomewhat beaked, deeply cloven; ſtigmas three. *Seed* inverſely egg-ſhaped, triangular, tipped with the permanent ſtyle. Common in marſhy ground; flowering in May and June. 168. C. *faſciculata*, Wahlen. 128. Link Flor. Luſ. Schkuhr 99. tab. Z z. fig. 114. "Spikes nearly ſeſſile, linear; males ſeveral; bractes partly embracing the ſtem, foliaceous, long; glumes elliptical, long; fruit oval, beaked, ciliated at the edges; orifice ſomewhat divided;

ſtigmas three." A native of Portugal. 169. C. *filiformis*, Linn. Sp. Pl. 23. Mart. 27. Smith. 52. Wahlen. 77 Schkuhr 69. tab. K. fig. 45. (C. tomentoſa, Lightf. Hudſon. C. hirta, Flor. dan. tab. 379. excluſive of the ſeparate ſpike, which is C. hirta.) "Spikes egg-ſhaped; ſheaths nearly as long as the peduncles; glumes pointed; fruit downy; leaves channelled, ſmooth." *Root* perennial, creeping. Whole herb ſmooth. *Stem* two feet high, erect, ſlender, round, ſmooth, ruſh-like, except towards the top, where it often has three rough angles. *Leaves* upright, ſtraight, narrow, channelled, without any ſharp keel, pointed, rough at the edge. *Bractes* like the leaves, overtopping the ſtem; ſheaths ſhort, but nearly as long as the peduncles, ſurmounted by ſmall auricles. *Male ſpikes* two, rarely one, rather remote, unequal in ſize, lanceolate; glumes elliptic-oblong, rather acute, blackiſh, with a yellow nerve. *Female ſpikes* two, rarely one, rather remote, egg-ſhaped, erect; glumes like thoſe of the male, but often ſlightly awned, ſmooth. *Fruit* imbricated, egg-ſhaped, ribbed, blackiſh, clothed with ſhort, tawny down, ending in a ſhort cloven beak; ſtigmas three. *Seed* elliptical, triangular, terminated by the ſhort ſtyle. Dr. Smith, to whom we are almoſt entirely indebted for the ſpecific characters and deſcriptions of all the Britiſh ſpecies. A native of England and Scotland, but rather rare, flowering in June. 170. C. *gigantea*, Rudge in Linn. Tranſ. vol. vii. p. 99. "Male ſpikes round, erect; females larger, turgid, fruit inflated, globular, beaked, acuminate, ſpreading." *Stem* erect, ſtriated, triangular, ſmooth. *Leaves* broad, dark green much longer than the ſtem, hiſpid at the edges and on the keel, ribbed; ſpaces between the ribs knotty. *Male ſpikes* three; two upper ones near together; lower one more diſtant; glumes denſely imbricated. *Female ſpikes* three, far exceeding in ſize thoſe of every other ſpecies; the upper one a little incurved, ſeſſile; the others alternate, peduncled, pendulous; flowers looſely imbricated, divaricated; glumes oblong-egg-ſhaped, awned, keeled, white and tender at the edge, half as long as the fruit. *Fruit* globular, much inflated, ſtriated, looſely imbricated, divaricated, beaked with a long awn; orifice with two teeth; ſtigmas three; ſeed triangular, ſmooth. A native of Carolina. 171. C. *paleacea*, Wahlen. 131. Schreb. in Muhlem. Act. Americ.? "Spikes cylindrical; males ſeveral; peduncles long, reclined; bractes partly embracing the ſtem, foliaceous, diſtant; glumes terminated by a long ſerrated point; fruit roundiſh, pointed; orifice emarginate; ſtigmas two; ſtem lax." A native of North America. 172. C. *maritima*, Wahlen. 132. Flor. dan. 704. Schkuhr tab. W. fig. 74. "Spikes on long peduncles, pendulous, cylindrical; males ſeveral; bractes partly embracing the ſtem, foliaceous, diſtant; glumes with long points; fruit nearly orbicular, pointed; orifice emarginate; ſtigmas two; leaves broadiſh." A native of the ſea coaſt in Norway. 173. C. *cuſpidata*, Wahlen. 133. "Spikes on ſhortiſh peduncles, oblong-cylindrical; bractes partly embracing the ſtem, foliaceous, ſomewhat diſtant, remote from the male ſpike; glumes with rather long points; fruit ſomewhat orbicular, pointed; orifice emarginate; ſtigmas two; leaves ſoft, a little incurved at the edges." A native of muddy ſhores in Norway. 174. C. *ſalina*, Wahlen 134. "Spikes on ſhortiſh peduncles, oblong-cylindrical; bractes partly embracing the ſtem, foliaceous, rather remote; fruit ſomewhat orbicular, rather large, pointed; orifice emarginate; ſtigmas two; leaves ſoft, incurved at the edges; ſheaths very long, nearly equal." A native of the ſea-coaſt of Norway. 175. C. *aquatilis*, Wahlen. 135. "Spikes on ſhort peduncles, ſomewhat linear, thickened and club-ſhaped above; bractes partly embracing the ſtem, foliaceous, long, rather remote; fruit ſomewhat lenticular, rather ſmall, pointed; orifice quite entire; ſtigmas two; ſtem firm, obtuſely angular; leaves ſtiff, incurved at the edges; the loweſt ſheath rather ſhorter." A native of the banks of rivers in Lapland C. nardifolia. "Spikes nearly ſeſſile, ſhort; male linear; bractes foliaceous, diſtant; glumes rounded, rather thick, nearly as long as the fruit; fruit egg-ſhaped, flattiſh on both ſides, rather acute; orifice protruded; leaves very narrow, ſomewhat convolute." A native of alpine marſhes in Lapland. 176. C. *hiſpida*, Wahlen. 137. Schkuhr 51. tab. 8. fig. 64. "Spikes nearly ſeſſile, cylindrical, very denſely flowered; males ſeveral; bractes partly embracing the ſtem, foliaceous, long, rather remote; glumes as long as the fruit, mucronate; fruit inverſely egg-ſhaped, hiſpid at the edges, with a ſomewhat two-toothed tip; ſtigmas two; leaves broad." A native of Barbary.

Carex *lithoſperma*; Linn. Syſt. nat. See Scleria Flagellum.

Carex, in *Geography*, an iſland ſituate in the Perſian gulf.

CAREY, Henry, in *Biography*, a poet and muſician, who, perhaps, among philoſophers, men of ſcience, and artiſts of the firſt claſs, may be deemed ſomewhat too facetious to be allowed a record here. But as he had the power of exciting mirth without profligacy, indecorum, or licentiouſneſs, which none of his buffoon predeceſſors, ſuch as Cornyſhe, Coryat, Tom Brown, Tom d'Urfy, George Alexander Stevens, &c. could do; we think that, at leaſt as long as many of his works are ſtill in uſe, he ſhould not be plunged into the gulf of oblivion. For though he was not a deep muſician, or a great poet, he had genius and abilities in both theſe arts ſufficient to intereſt and amuſe the public by his productions, if not in a ſublime manner, yet in a way not diſgraceful to himſelf, or his admirers. This being premiſed as an apology for the hero of this article, and for his biographers, we ſhall proceed to detail the principal events of his profeſſional life.

Of his birth and parentage we know nothing; and of his education are only certain that he was not a regular bred muſician. It has been ſaid, indeed, that he had his firſt leſſons from a German of the name of Witchinſon Lennert; that Roſcingrave had been kind to him; and that he was, in ſome ſort, a diſciple of Gemminiani. But the reſult of all theſe inſtructions did not, as his friend Lampe, a man of truth, uſed to ſay, enable him to make a baſe to his own ballads.

Poor Carey has been under-rated by his biographers, in ranking him as a man of humour, a writer of ballads, and an inventor of melodies, below Tom D'Urfy. *Carey*'s humour may ſometimes be *low*, but it was never groſs or immoral; and d'Urfy's was nothing elſe. For in the ſix volumes of "Pills to purge Melancholy," there is ſcarcely an innocent ſong to be found.

The firſt we hear of *Carey* was, that he produced two farces in the year 1715, one of which, *the Contrivances*, is ſaid in the *Biographia Dramatica*, to be a very entertaining piece, which had good ſucceſs in its day."

In 1730, it appears, that when *Miſs Rafter*, afterwards the celebrated Mrs. Clive, firſt appeared on the ſtage of Drury-Lane as a ſinger, it was at the benefit of *Harry Carey*, who ſeems to have been her ſinging-maſter. The manner in which this benefit was announced in the *Daily Poſt*, December 3d, is ſo ſingular that we ſhall tranſcribe the paragraph for the amuſement of our readers. After naming the play, which was *Greenwich Park*, and the additional entertainments of ſinging; particularly a dialogue of Purcell by Mr. Carey and Miſs Rafter, and a cantata of Mr. Carey's by Miſs Rafter, there is an apology from Carey, for "the tragedy of half an act" not being performed ; but a promiſe is made of indemnification by the entertainments between the acts. The editor of the paper then adds ; " but at our friend Harry Carey's benefit to-night, the powers of muſic, poetry, and painting, aſſemble in his behalf, he being an admirer of the three ſiſter arts : the body of muſicians meet in the Haymarket, whence they march in great order, preceded by a magnificent moving organ, in form of a pageant, accompanied by all the kinds of muſical inſtruments ever in uſe from Tubal Cain to this day ; a great multitude of bookſellers, authors, and printers, form themſelves into a body at Temple-bar, whence they march with great decency to Covent-garden, preceded by a little army of printers' devils, with their proper inſtruments : here the two bodies of muſic and poetry are joined by the brothers of the pencil ; when, after taking ſome refreſhment at the Bedford Arms, they march in ſolemn proceſſion to the theatre, amidſt an innumerable crowd of ſpectators."

Poetry and muſic, in high antiquity, formed but one profeſſion, and many have been the lamentations of the learned that theſe ſiſter arts were ever ſeparated. Honeſt Harry Carey and Jean Jaques Rouſſeau are the only bards in modern times who have had the addreſs to reconcile and unite them. The *Honeſt Yorkſhireman* of Carey and the *Devin du Village* of Rouſſeau are indiſputable proofs that popular ſtrains, at leaſt, if not learned and elegant muſic, may be produced by the writer of a dramatic poem. Carey, without muſical learning, invented many very pleaſing and natural melodies, which neither obſcured the ſenſe of the words, nor required much ſcience to hear. But either from the ambition of the ſinger, or expectations of the audience, muſic is not ſuffered to remain ſimple long upon the ſtage ; and the more plain and ancient the melodies, the more they are to be embelliſhed by every new performer of them. The tunes in the *Beggar's Opera* will never appear in their original ſimple garb again.

In 1732, he produced the words of two ſerious operas ; *Amelia* and *Teraminta*. The firſt of theſe was ſet by Lampe, and the ſecond by the late Mr. Smith, Handel's diſciple, friend, and ſucceſſor, in ſuperintending the performance of oratorios.

In 1734 his mock tragedy of half an act, called *Chrononhotonthologos*, was firſt performed at the little theatre in the Haymarket ; a piece of humour that will always be in ſeaſon, as long as extravagance and bombaſt ſhall dare to tread the ſtage.

In 1736, and for ſeveral ſubſequent years, his little Engliſh opera, entitled *The Honeſt Yorkſhireman*, was almoſt always in conſtant run.

The year 1737 was rendered memorable at Covent garden theatre by the ſucceſs of the burleſque opera of the *Dragon of Wantley*, written by Carey, and ſet by Lampe, " after the Italian manner." This excellent piece of humour had run twenty-two nights, when it was ſtopped, with all other public amuſements, by the death of her Majeſty Queen Caroline, November 20th, but was reſumed again on the opening of the theatres in January following, and ſupported as many repreſentations as the *Beggar's Opera* had done, ten years before. And if Gay's original intention in writing his muſical drama was to ridicule the opera, the execution of his plan was not ſo happy as that of Carey ; in which the mock heroic, tuneful monſter, recitative, ſplendid habits, and ſtyle of muſic, all conſpired to remind the audience of what they had ſeen and heard at the lyric theatre, more effectually than the moſt vulgar ſtreet tunes could do ; and much more innocently than the tricks and tranſactions of the moſt abandoned thieves and proſtitutes. Lampe's muſic to this farcical drama, was not only excellent fifty years ago, but is ſtill modern and in good taſte.

In 1738 *Margery, or the Dragoneſs* ; a ſequel to *the Dragon of Wantley*, written with equal humour, and as well ſet by Lampe, came out ; but had the fate of all ſequels. When the novelty of a ſubject is faded away, and the characters have been developed, it is difficult to revive the curioſity of the public about perſons and things of which opinions are already formed. The *Dragoneſs* appeared but few nights, and was never revived.

*Nancy*, or *the parting Lovers*, was produced after theſe, and likewiſe ſet by Lampe ; but the occaſional ſongs and cantatas which he wrote and ſet to muſic himſelf, are innumerable. His burleſque birth-day ode, turned the odes of Cibber into ridicule as effectually as Pope's Dunciad could do. And his ballad of *Sally in our Alley*, had the honour of being praiſed by Addiſon for the poetry, and Gemminiani for the tune. But though poor Carey was a ſucceſsful poet and muſician, he was always indigent and heavy on the hands of his friends. He ſeems to have been profeſſionally active, he taught muſic at ſmall boarding ſchools and private houſes upon low terms, and had no particular vice or extravagance laid to his charge ; but whether his embarraſſed circumſtances, domeſtic unhappineſs, the malignity of rival but leſs ſucceſsful writers, or from whatever cauſe, in a fit of inſanity or deſpondency, Oct. 4, 1743, at his houſe in Warner Street, Cold bath fields, he terminated with a cord a life which he had innoxiouſly, and not uſeleſsly, ſpent.

This preciſe date of his fatal cataſtrophe totally invalidates the claims that have been made of late by his ſon for the honour of having written and ſet the loyal and national ſong at the time of the rebellion in 1745, *God ſave great George our King!* which we have cogent reaſons to believe was written for king James II. while the prince of Orange was hovering over the coaſt. And when he became king, who durſt own or ſing it ? We are certain, that in 1745, when Dr. Arne harmonized it for Drury lane theatre, and C. B. for Covent-garden, the original author of the melody was wholly unknown.

CAREY'*s*, *chicken*, or *gooſe*, *Mother*, in *Ornithology*. See PROCELLARIA *gigantea*.

CARFA, in *Geography*, a town of Arabia ; 176 miles N.W. of Jamama.

CARFAGNANO, or CASTEL-NUOVO DI CARFAGNANO, a town of the duchy of Modena, and capital of a lordſhip, which is partly in the Modeneſe, partly in the Bologneſe, and partly in the republic of Lucca ; 18 miles N. of Lucca, and 37 S.S.W. of Modena.

CARGADORS, a name given by the Dutch to a kind of brokers, who make it their ſole buſineſs to find freight for ſhips which want lading, and veſſels for merchants or paſſengers who want conveyance to ſuch or ſuch a place.

CARGO, the lading or freight of a ſhip. See FREIGHT.

CARGO, *fortable*, is that which contains ſomething of every ſort neceſſary to furniſh the tradeſmen of the place it is ſent to, with parcels fit to fill their ſhops, and invite their cuſtomers. Officers and ſailors on board a veſſel are allowed to carry a ſmall cargo, or " pacotille," not exceeding a certain bulk or weight, for their own account, without paying any freight.

CARGO is ſometimes alſo uſed for an invoice of the goods wherewith a ſhip is laden. See INVOICE.

CARGO alſo denotes a weight uſed in Spain and Turkey, amounting to about 300 Engliſh pounds.

CARGOU, in *Geography*, a ſmall iſland in the Perſian gulf, near the coaſt of Farſiſtan.

CARHAIX, a town of France, in the department of Finiſterre, and chief place of a canton in the diſtrict of Chateaulin, ſeated on the Yer, in a fruitful country, that feeds great numbers of cattle, with plenty of game; 6½ leagues S. of Morlaix. The place contains 1734, and the canton 13,464 inhabitants; the territory comprehends 322½ kiliometres and 9 communes.

CARHAM, a village of England, in the county of Northumberland, which deſerves notice on account of the ſingular events that have occurred in its vicinity. Near this place a battle was fought between the Engliſh and the Danes, in which 11 biſhops and 2 Engliſh counts were ſlain, beſides a great number of ſoldiers. Here likewiſe was fought, in 1018, a battle between the Engliſh and the Scots, in which the latter were victorious. In the 24th year of Edward I. an abbey was burned here by the Scots, under the command of Wallace; and in the 44th year of Edward III. 1370, ſir John Lilburn was defeated near this place by the Scots, under the command of ſir John Gordon, and taken priſoner with his brother. Carham is diſtant 5 miles E. of Kelſo, and 28 N.W. of Alnwick.

CARIA, in *Ancient Geography*, a province of Aſia, occupying the ſouth-weſtern part of Aſia Minor, or Anatolia. It is bounded on the north by Ionia, Lydia, and the river Mæander, which ſeparated it from Ionia; on the eaſt by Great Phrygia and part of Lycia, its natural boundaries being high mountains; and on the ſouth and weſt by the ſea. Geographers, however, are not agreed about its preciſe limits. Their different opinions may be ſeen in Cellarius's Ancient Geography. This country was for ſome time called Phœnicia, becauſe the Phœnicians had conſiderable eſtabliſhments in it; but it is ſaid to have taken the name of Caria from Car, the brother of Lydus; and it comprehended a ſmall province, forming a kind of peninſula towards the ſouth-weſt, called *Doris*, which ſee. The interior of this country preſents ſome chains of mountains; the chief of which were Latmus, on the weſt towards Miletus, and the Montes Calindici, towards the ſouth-eaſt near Calinda. The principal towns of Caria were Miletus, Myndus, Halicarnaſſus, Ceramus, Bergaſa, and Cnidus, which were ſituated along the weſtern coaſt. The Rhodians poſſeſſed a part of this country towards the ſouth, under the name of *Peræa*, which ſee. In the interior of the country are found Alabanda, Apollonia, and Antiochia ad Mæandrum, Aphrodiſias, Stratonice, Alinda, Pedaſus, and, towards the ſouth, Caminus, Calinda, &c. Caria was leſs cultivated than it might have been, becauſe the inhabitants employed themſelves very much in maritime concerns. Its mountains, however, furniſhed numerous flocks, and its wool was held in high eſtimation.

The Carians claimed the honour of being aborigines, (though ſome authors aſcribe their origin to the Pelaſgi, and others to the Cretans), and traced their name and origin to Car, the brother of Lydus and Myſus; and they thought this genealogy was confirmed by the antiquity of the temple of Jupiter the Carian, built at Mylaſes, where, from time immemorial, they aſſembled in common with the Lydians and Myſians. Hence they concluded that they had the ſame anceſtors with theſe people, according to the report of Herodotus. Homer, ſays Stephanus Byzantinus, repreſented the Carians as barbarians, becauſe they were enemies to the Ionians; but the epithet βαρβαροφωνους, which this ancient poet applies to them, ſhews, that he referred to their language, and not to their political conduct. The Carians multiplied themſelves to ſuch a degree under the government of the deſcendants of Car, that they extended their eſtabliſhments to the neighbouring iſlands. Accordingly they took poſſeſſion of the iſle of Rhodes, belonging to the Phœnicians; and thus the acceſs of this warlike nation to the other iſlands of the Ægean ſea was facilitated. Thucydides ſays, that Minos II. drove the Carians from the iſlands of the Cyclades; but Herodotus informs us, that Minos allowed them the poſſeſſion of theſe iſlands, together with unmoleſted liberty to cultivate them, and an exemption from tribute, on condition of their furniſhing his fleet with a number of veſſels. In proceſs of time different colonies of Greeks were introduced into Caria, and the original inhabitants were obliged to retire into the mountains, and to fortify themſelves againſt the acceſs of their enemies. At length the ſterile ſoil of their mountainous retreat reduced them to a ſtate of poverty, which rouſed their courage; and they conſtructed veſſels and traverſed the ſea, and thus acquired a degree of power, which gave them the rank of a maritime empire. Euſebius refers this period to the interval that elapſed from the 11th to the 27th olympiad. Diodorus Siculus fixes the epocha of the maritime power of the Carians immediately after the taking of Troy, and pretends, that by means of their veſſels they got poſſeſſion of the iſle of Leſbos. Herodotus ſays, that they very much contributed to the perfection of the military art by their ingenious inventions. The Carians, who were both a maritime and military people, aſſiſted in eſtabliſhing Pſammetichus on the throne of Egypt, and he recompenſed their ſervices in a very liberal manner. Thus attached to the intereſt of his houſe, they ſuccoured Apries, the laſt of the deſcendants of this prince, when Egypt attempted to emancipate themſelves from his power, and for ſome time reſiſted the attacks of all his enemies; but when Apries fell, they were obliged to ſubmit to the conqueror. Amaſis, conceiving that they would afford him very conſiderable ſupport, engaged them in his cauſe, by aſſigning to them a territory in the diſtrict of Memphis, the capital of his dominions. They evinced their attachment to Pſammetichus, the ſon and ſucceſſor of Amaſis, when Cambyſes undertook the conqueſt of Egypt. Accordingly they joined his army: but when the Perſians proved victorious, the ſurviving Carians retired into their own country, which had ſuffered much from its conteſts with the kings of Lydia. Alyattes was the firſt of all the ſucceſſors of Gyges who formed the project of reducing the Carians to his dominion; but he probably did not ſucceed, as Herodotus reckons Caria in the number of the provinces annexed to the empire of Lydia by the arms of Crœſus. After various ſtruggles in defence of their country and their liberty, they were at laſt obliged to ſubmit to the Perſians, upon the reduction of Miletus. In the expedition of Xerxes againſt Greece, the Carians aſſiſted him with 70 veſſels, which were annexed to his naval armament. Lygdamis, to whom, according to Pauſanias, the Lacedæmonias erected a ſtatue, aſcended the throne of Caria towards the 83d olympiad, and was ſucceeded by Hecatomnus, who made Mylaſa the capital of his kingdom. He was allowed by the Perſian court to poſſeſs the kingdom of Caria till his death, which happened in the 99th or 100th olympiad. His ſucceſſors reigned 42 years. Artemiſia, the ſecond of that name, married Mauſolus her brother, according to Arrian, who pretends that cuſtom authoriſed ſuch marriages in Caria. This prince reunited the whole of Caria under his dominion, and fixed his reſidence at Halicarnaſſus, which ſurpaſſed in magnificence all the cities of Caria. Mauſolus made ſucceſsful attacks on the Ionians, Lydians, and Lycians; and under his conduct the Carians got poſſeſſion of the iſland of Rhodes. At the death of Mauſolus, in the 4th year of the 106th olympiad, B.C. 353, the Rhodians threw off the yoke of the Carians; but Artemiſia, the ſiſter and widow of this prince, reduced them to their allegiance, and alſo the inhabitants of the iſland of Cos, who had imitated their neighbours in their revolt. At the death of Artemiſia, Idrieus aſſumed the reins of government, and when he died, the Carians conferred the crown on Ada, his ſiſter and wife. Diodorus Siculus ſays, that the Perſian court gave the inveſtiture of the kingdom to a ſatrap; but Ada courageouſly reſiſted him, and at length, deprived of her dominions, ſhe retired to the fortreſs of Alinda, which ſhe maintained till the arrival of Alexander in Aſia. When Alexander had gained the battle of the Granicus, he penetrated into Caria, and re-eſtabliſhed Ada in poſſeſſion of her kingdom. Arrian ſays that Ada adopted Alexander; but Plutarch ſuggeſts, that this conqueror adopted Ada, and always called her his mother.

Caria, a town of Aſia Minor, in a country of the ſame name. Ptolemy places it in Lycia. *Caria* was alſo an epiſcopal town of Aſia, placed upon the Mæander.

Caria, a name given by Arrian to a maritime country of Scythia, on the Euxine ſea. It was an eſtabliſhment of Carians, on this ſide of the Boryſthenes, and at a diſtance from the Tanais.

Caria, in *Entomology*, the name by which ſeveral travellers diſtinguiſh thoſe miſchievous inſects that infeſt the Eaſt Indies, Africa, and other parts of the world, and which are known among modern naturaliſts by the name of *Termites*, and white ants. See Termes.

CARIABAD, in *Geography*, a town of Hindooſtan, in the ſoubah of Oude; 40 miles N. of Lucknow.

CARIACO, a large gulf in the province of Comana, Terra Firma, South America. On the northern ſide at its mouth is Fort St. Yago, in N. lat. 10° 7′. W. long. 63° 30′; and on the ſouthern ſide cape Bordones.

CARIACOU, the chief of the ſmall iſles dependent on the iſland of Grenada, in the Weſt Indies; ſituate about 4 leagues from Iſle Ronde, which is equally diſtant from the north end of Grenada. N. lat. 12° 30′. W. long. 61° 22′. It contains 6913 acres of land, and in general is fertile and well cultivated, producing in ſeaſonable years a million of pounds of cotton for exportation, beſides corn, yams, potatoes, and plantains ſufficient for the maintenance of its negroes. The cultivation of ſugar has been found leſs ſucceſsful in this iſland than cotton, though it ſtill continues to be made on two plantations. The number of inhabitants in 1779 was 5000; but they have ſince decreaſed. See Grenada. Cariacou forms a 7th pariſh belonging to Grenada; and by an act paſſed in 1784, a ſtipend is provided for a clergyman in this pariſh. The pariſh town of this iſland is Hillſborough.

Cariacou, in *Zoology*, a ſpecies of *Cervus*, which ſee.

CARIAMA, in *Ornithology*, the name of a Braſilian bird, deſcribed by Marcgrave in his Hiſtory of Braſil: this is the creſted ſcreamer, *Palamedea criſtata* of modern naturaliſts.

CARIANERS, or Carayners, in *Geography*, a people of ſingular deſcription that inhabit different parts of the Birman empire, particularly the weſtern provinces of Dalla and Baſſien, ſeveral ſocieties of whom alſo dwell in the diſtricts adjacent to Rangoon. None of them are to be found higher up than the city of Prome. They are a ſimple innocent race, ſpeaking a language diſtinct from that of the Birmans, and entertaining rude notions of religion. They lead altogether a paſtoral life, and are the moſt induſtrious ſubjects of the ſtate: their villages form a ſelect community, from which they exclude all other ſects, and never reſide in a city, nor intermingle, nor marry with ſtrangers. They profeſs, and ſtrictly obſerve, univerſal peace, not engaging in war, nor taking part in conteſts for dominion; and thus they are placed in a ſtate of ſubjection to the ruling powers. Agriculture, the care of cattle, and the rearing of poultry, are almoſt their only occupations. A great part of the proviſions conſumed in the country is raiſed by the Carianers, who particularly excel in gardening. The oppreſſion which they have lately ſuffered has induced numbers of them to withdraw into the mountains of Arracan. They have traditional maxims of juriſprudence for their internal government, but they are without any written laws; cuſtom, with them, conſtitutes the law. Some of them learn to ſpeak the Birman tongue, and a few can read and write it imperfectly. They are timorous, honeſt, mild in their manners, and very hoſpitable to ſtrangers. Symes's Embaſſy to Ava, vol. ii. p. 109.

CARIATA, in *Ancient Geography*, a town of Aſia, in Bactriana, deſtroyed by Alexander.

CARIATI, Nuova, in *Geography*, a town of Naples, in the province of Calabria Citra, ſituated on the S.W. coaſt of the gulf of Tarento; 25 miles N. of St. Severino. N. lat. 30° 38′. E. long. 16° 6′. At the diſtance of 2 miles S.W. of the former is *Cariati Vecchia*, in the ſame province, the ſee of a biſhop, ſuffragan of St. Severino. It is farther from the ſea, towards the river Caneta. Cariati is a principality belonging to the family of Spinelli, one of the moſt opulent feudatory families, divided into ſeveral branches, and poſſeſſed of very capital fiefs in Calabria. The founder of this family was John Baptiſt Spinelli, who was very much diſtinguiſhed by Ferdinand the Catholic, on his arrival at Naples, and enabled to purchaſe Cariati and other conſiderable eſtates, ſince augmented by the prudence of his deſcendants. The city is ſmall, and thinly inhabited, on account of the weakneſs of its ſituation, and dread of the Turks, who, before a treaty was concluded with the Porte, were continually ravaging this coaſt. Its cathedral is a very heavy Gothic ſtructure, dedicated to St. Peter, and the only pariſh. The ſurrounding hills are gay, and pleaſingly covered with fruit-trees; the woods behind them produce manna of excellent quality; much Turkey wheat is cultivated in the lands below, and extenſive paſtures afford luxuriant and wholeſome ſuſtenance to a great ſtock of oxen, buffaloes, ſheep, goats, and ſwine.

CARIATIDES, or Cariates, in *Architecture*. See Caryatides.

CARIBALDI. See Garibaldi.

CARIBBEAN sea, in *Geography*, that part of the Atlantic ocean, which is bounded on the north by the iſlands of Jamaica, St. Domingo, Porto Rico, and the Virgin iſlands, on the eaſt by the Caribbean iſlands, on the ſouth by the country of Terra Firma, and on the weſt by the Muſketto ſhore.

CARIBBEE islands, a range of iſlands extending in a kind of ſemicircular form, from Tobago in the ſouth to Porto Rico in the north, and encloſing as it were between them and the main land the Caribbean Sea. They were diſcovered by Columbus in his ſecond voyage, in November, 1493; and thus called by him from the name which the natives of Hiſpaniola gave to their ancient poſſeſſors. The term Caribbee or Charaibean is ſtrictly applicable only to the *windward* iſlands, which were inhabited by the Caribbees or Charaibes; and the four large iſlands of Cuba, Jamaica, Hiſpaniola, and Porto Rico, are denominated *leeward* iſlands. But Engliſh mariners appropriate both terms to the Caribbee iſlands only, ſubdividing them according to their ſituation in the courſe of the trade wind; the windward iſlands terminating by their arrangement with Martinico, and the leeward commencing at Dominica, and extending to Porto Rico. The Caribbee iſlands are eminently fertile, and in a commercial view highly advantageous; their chief poſſeſſors are the Engliſh and French. Barbadoes, Antigua, St. Chriſtopher's, St. Vincent, Dominica, Grenada, Montſerrat, Nevis, and the Virgin iſles are Britiſh; and the French poſſeſs Martinico, Guadaloupe, St. Lucia, Tobago, and ſome iſlets. To the Danes belong St. Croix, St. Thomas, and St. John, parts of the Virgin group; the Swedes hold St. Bartholomew; and the Dutch St. Euſtatius. Of the whole group lying between the 58th and 66th degrees of W. longitude, and the 11th and 19th degrees of N. latitude, Barbadoes and Guadaloupe are the moſt important; and the latter, including Grand Terre, and Baſſe Terre, is the moſt conſiderable in ſize. For a farther account of each iſland, ſee its appropriate article.

CARIBBEES, or Charaibes, the ancient poſſeſſors of moſt of the iſlands above mentioned. Columbus in his firſt voyage received information, that ſeveral of theſe iſlands were inhabited by a people of this name, who were fierce, ſavage, and predatory, the terror of the mild and inoffenſive inhabitants of Hiſpaniola, and who delighted in the horrid banquet of human blood. In his ſecond expedition, he found this information to be juſt, and was himſelf a witneſs of their intrepid valour. In their habitations, when he landed at Guadaloupe, he found relicts of thoſe feaſts which they had made upon the bodies of their enemies taken in war; and at the ſame time, he releaſed ſeveral of the natives of Porto Rico, who, having been brought captives from thence, were reſerved as victims for the ſame horrid purpoſe. See Cannibal. The ſame character for valour and intrepidity has been invariably maintained by theſe people in all ſubſequent conteſts with the inhabitants of our continent; and even, in our own times, they have made a gallant ſtand in defence of the laſt territory which the rapacity of the Europeans had left in their poſſeſſion. M. de Chanvalon, an intelligent and philoſophical obſerver, who viſited Martinico in 1751, and reſided there ſix years, gives the following deſcription of the Caribbees. "It is not the red colour of their complexion, it is not the ſingularity of their features, which conſtitutes the chief difference between them and us. It is their exceſſive ſimplicity; it is the limited degree of their faculties. Their reaſon is not more enlightened or more provident than the inſtinct of brutes. The reaſon of the moſt groſs peaſants, that of the negroes brought up in the parts of Africa moſt remote from intercourſe with Europeans, is ſuch that we diſcover appearances of intelligence, which, though imperfect, is capable of increaſe. But of this the underſtanding of Caraibs ſeems to be hardly ſuſceptible. If ſound philoſophy and religion did not afford us their light; if we were to decide according to the firſt impreſſion which the view of that people makes upon the mind; we ſhould be diſpoſed to believe that they do not belong to the ſame ſpecies with us. Their ſtupid eyes are the true mirror of their ſouls; it appears to be without functions. Their indolence is extreme; they have never the leaſt ſolicitude about the moment which is to ſucceed that which is preſent." Voyage à la Martinique, p. 44, 45, 51. M. de la Borde, Tertre, and Rochefort, confirm this deſcription. Mr. Edwards (ubi infra) very properly obſerves, that M. Chanvalon ſeems to have formed his judgment of all the Charaibes from the few with whom he had any communication, and that he makes no allowance for their degradation in a ſtate of captivity and ſervitude; though he admits this circumſtance and ſtrongly urges it in favour of the African blacks in the Weſt Indies. The Caribbees evidently appear by the marked diſtinction of their character to be a ſeparate race from the inhabitants of the larger iſlands. Their language is totally different; and among themſelves, they have a tradition, that their anceſtors came originally from ſome part of the continent, and having conquered and exterminated the ancient inhabitants, took poſſeſſion of their land, and of their women. Hence they call themſelves "Banaree," which ſignifies a man come from beyond ſea. Accordingly, the Caribbees ſtill uſe two diſtinct languages, one peculiar to the men, and the other to the women; nor has the language of the men any thing common with that ſpoken in the large iſlands; whereas the dialect of the women conſiderably reſembles it. The tradition derives from this circumſtance conſiderable confirmation. The Caribbees themſelves imagine, that they were a colony from the "Galibis," a powerful nation of Guiana, in South America. But as their fierce manners approach nearer to thoſe of the people in the northern continent, than to thoſe of the natives of South America; and as their language has ſome affinity to that ſpoken in Florida, their origin ſhould be deduced rather from the former than the latter. In their wars, they ſtill obſerve their ancient practice of deſtroying all the males, and preſerving the women either for ſervitude or for breeding. Rochefort in his account of the Antilles, publiſhed in 1658, conjectures, that they ſprung originally from Florida, and deſcribes them as a colony of Apalachian Indians, who, being driven from the continent, arrived at the windward iſlands, and exterminating the ancient male inhabitants, took poſſeſſion of their lands, and of their women. But being unable to ſubdue the inhabitants of the larger iſlands, theſe retained their diſtinctive manners and character. Mr. Edwards agrees in opinion with thoſe, who trace their origin to a South American colony. To this purpoſe he ſays, that there anciently exiſted many numerous and powerful tribes of Charaibes on the ſouthern peninſula, extending from the river Oronoko to Eſſequebe, and throughout the whole province of Surinam, even to Braſil, ſome of which ſtill maintain their independence. With one of theſe tribes ſir Walter Raleigh formed an alliance, in his romantic expedition to Guiana in 1595; and he aſſures us, that the Charaibes of that part of the continent ſpoke the language of Dominica. Mr. Edwards, indeed, inclines to the opinion of Hornius, who aſſigns to theſe people an oriental anceſtry, that migrated to the weſt acroſs the Atlantic; and in confirmation of this opinion he alleges a ſimilarity in the language of the Charaibes to the ancient oriental dialects, and alſo a ſtriking reſemblance in their cuſtoms and manners to thoſe of the inhabitants of the eaſt. The word "Charaibe," he ſays, in the Arabic language, ſignifies a robber or deſtroyer, an appellation frequently beſtowed by the natives on the invaders of their country. As there were prieſts or prophets in Braſil under the appellation of Charaibes, they might have been called קרב איש, as men who offer קרבן, *corban*, an offering (ſee Lev. i. 2.); and κορυβας is the Greek for a prieſt of Cybele, or one of the Corybantes. But if the national name be derived from the warlike and predatory life of the Charaibes, we may derive it from חרב, ſignifying in Syr. and Arab. to *lay waſte*. The noun denotes a ſword or ſpear, and חרבה *Sam. war*.

Mr. Edwards has given us an highly intereſting deſcription of theſe ſavages; their national manners, habits, education, and ſuch political and religious inſtitutions as ſavages could fabricate; of all which we ſhall preſent our readers with the following conciſe epitome, referring to the author himſelf (ubi infra) for a more ample detail. Every trait in the character of a Charaibe marks him for a foreigner. The antipathy which this fierce race bears to the unoffending and more cultivated natives of the larger iſlands of Hiſpaniola,

paniola, Cuba, and Jamaica; his robuſt and muſcular form, his towering, independent ſpirit, diſdainful of reſtraint, and impatient under calamity; his dreadful feaſt on the human fleſh of captives, whilſt towards his own brethren he is faithful, kind, affectionate, and peaceable; and the inciſions which he makes on his ſcarified body, painted alternately with black and crimſon, to render him terrific to his enemies in battle;—all conſpire to proclaim him an *exotic*, tranſplanted either by deſign or accident from ſome diſtant clime, and bearing with him to his new abode the interminable impreſſions of his primitive *caſt*. A Charaibe youth is educated amidſt accumulated toils and ſufferings. One of the earlieſt maxims inculcated on his tender mind was to bear exquiſite pain without murmuring:—like the Spartan youth at the altar of Diana, he was ſcourged until agonizing nature was nearly exhauſted; but no ſigh was heard, no tear was ſeen to fall; for, if the ſeverities which he ſuſtained occaſioned the leaſt ſign of weakneſs or ſenſibility, he was diſgraced for ever. Public honours and national rewards crowned the fortitude that never ſhrunk from inflicted torture:—above all things, he was taught to cheriſh an inexorable hatred, and an inſatiable thirſt of revenge, againſt his natural enemy, the *Arrowauks* (which ſee), the inhabitants of Hiſpaniola, Cuba, and Jamaica. When more mature years called the Charaibe to the field, ſtripes, burning, and ſuffocation, conſtituted the teſt of him who was to lead the national troops to action. His heart thus hardened, and his nerves thus ſteeled, he beheld the unbounded carnage of his foes without the leaſt remorſe, nor checked his ſavage ſquadrons in the career of their ſanguinary vengeance. Of their political maxims, one very prominent but diſguſting feature is diſplayed in that abject vaſſalage in which the Charaibes keep their women. They are mere houſehold drudges through life, and are denied even the privilege of eating in the preſence of the tyrant huſband. Mr. Edwards, on this ſubject, very juſtly obſerves, that the firſt viſible proof that a people are emerging from ſavage manners is a diſplay of tenderneſs towards the female ſex. As the ſucceſsful warrior was allowed to appropriate to himſelf as many of the captives as he thought fit, and his countrymen preſented to his choice the moſt beautiful of their daughters in recompence of his valour; this laſt mentioned teſtimony of public eſteem and gratitude probably gave riſe to the inſtitution of polygamy, which prevailed univerſally among the Charaibes, and ſtill prevails among thoſe of South America. This inſtitution, ſays Mr. E., is the more excuſable, as their women, from religious motives, carefully avoided the nuptial intercourſe after pregnancy. Their females, on attaining the age of puberty, were diſtinguiſhed by a ſort of buſkin, or half boot, made of cotton, which ſurrounded the ſmall of each leg. In other reſpects both males and females appeared naked. Their hair, which was of a ſhining black colour, was dreſſed and adorned with peculiar attention; and the men, in particular, decorated their heads with feathers of various colours. On the death of a relation or friend, they cut it ſhort like their ſlaves or captives, to whom the privilege of wearing long hair was rigorouſly denied. Like moſt other nations of the New Hemiſphere, they nicely eradicated the incipient beard, and all ſuperfluous hairs on their bodies. On the birth of a child, its head was confined between two ſmall pieces of wood, placed one before and the other behind, which, being firmly bound together, elevated the forehead, and occaſioned this and the back part of the ſkull to reſemble two ſides of a ſquare. They reſided in villages, which reſembled an European encampment; and their cabins were built of poles fixed circularly in the ground, drawn to a point at the top, and covered with leaves of the palm-tree. In the centre of the village was a building, larger than the reſt, which ſerved as a kind of hall, or ſtate-houſe, where their youth were animated to emulation, and trained to martial enterpriſe by the renown of their warriors, and the harangues of their orators.

Few arts and manufactures can be ſuppoſed to flouriſh among ſavages; yet the Caribbees ingeniouſly manufacture a ſubſtantial kind of cotton cloth, which they ſtain with various colours, and of which they make kamenoes, or hanging-beds; they alſo fabricate ornamental veſſels of baked clay; they work very elegant baſkets of the fibres of the palmetto-leaf; and their bows and arrows are finiſhed with ſingular ſkill and neatneſs. Among the Caribbees of the continent, there was no diviſion of land, every one cultivating in proportion to his exigencies. Their food, both vegetable and animal, except in the circumſtance of their eating human fleſh, ſeems to have been much the ſame with that of the natives of the larger iſlands. However, they held the fleſh of ſome animals in abhorrence; ſuch as that of the peccari, or Mexican hog, the manati or ſea-cow, and the turtle. They ſcrupled alſo to eat the eel, abundantly ſupplied by ſeveral of their rivers. In ſome of theſe reſpects they manifeſt a conformity to the cuſtoms of the Jews. It is a ſingular circumſtance, that on the birth of the firſt ſon, the father retired to his bed, and faſted with a ſtrictneſs that often endangered life. A ſimilar practice has been recorded concerning the Tybarenians of Aſia, and the Iberians of Spain, and is ſtill obſerved by the people of Japan. This ceremony of faſting was ſucceeded by rejoicing, drunkenneſs, and debauchery. They indulged extraordinary grief for their dead; they not only deſpoiled their hair, but when the maſter of the family died, the ſurviving relations, after burying the corpſe in the centre of his own dwelling, with many demonſtrations of unaffected grief, quitted the houſe altogether, and erected another in a diſtant ſituation. It was their cuſtom to place the dead in the grave in a ſitting poſture, with the knees elevated to the chin. As to their religious opinions and practices, we may obſerve, that they entertained the expectation of a future ſtate, and pleaſed themſelves with the fond conceit that their departed relatives were ſecret ſpectators of their conduct, ſympathizing in their ſufferings, and participating in their welfare. But regarding the ſoul as ſuſceptible of the ſame impreſſions and obnoxious to the ſame paſſions, as when allied to the body, they deemed it a religious duty to their deceaſed heroes, to ſacrifice at their funerals ſome of their captives which had been taken in battle. Immortality, without military glory, was conſidered by them as a curſe; to the brave and virtuous, as to their wives and captives, they allotted a kind of Mahometan paradiſe; but to the degenerate and cowardly they aſſigned a ſtate of puniſhment ſomewhere beyond the mountains, and an ignominy aggravated by captivity and ſervitude among the Arrowauks. The life of the Charaibe is not paſſed without acts of devotion paid to the univerſal Father. In every cottage is erected a ruſtic altar, compoſed of banana leaves and ruſhes, on which they offer to the Deity the earlieſt of their fruits, and the choiceſt of their proviſions. His religion, in fact, however, is a religion of horror; in part, perhaps, the reſult of the tremendous irregularities of the climate. They mark an avenging deity, amid the madneſs of the hurricane, and amid the convulſions occaſioned by frequent earthquakes. In the loud thunder of the tropic, the voice of the incenſed deity is heard, while his arm in imagined vengeance launches the lightning which fires the ſtanding fields of corn, and annihilates the promiſing harveſt. Accordingly, beſide the worſhip which they paid to benevolent deities, they not only believed in the exiſtence of demons and evil ſpirits, but offered to them alſo by the hands of their "Boyez," or pretended magicians, ſacrifices and worſhip; wounding themſelves, on ſuch ſolemnities, with an inſtrument made of the teeth of the agouti, which inflicted horrible gaſhes; conceiving, perhaps, that the malignant powers delighted in groans and miſery, and were to be appeaſed only by human blood. Robertſon's America, vol. ii. Edwards's Hiſt. of the Weſt Indies, vol. i.

CARIBEANA. See Paria and *New* Andalusia.

CARIBOU, an iſland towards the eaſt end of Lake Superior, in North America, S.W. of Montreal bay. N. lat. 47°. W. long. 85° 30′.

CARIBOU, in *Zoology*, an American animal of the ſtag kind. See Cervus *caribou*.

CARICA, in *Botany*, Linn. Gen. 1127. Schreb. 1536. Mart. Mil. (Papaya, Plum. p. 20. Tourn. Inſt. p. 659. Juſſ. p. 399. Vent. vol. iii. p. 521. Gært. 707. Papayer, Encyc. Method.) Claſs and order, *diœcia decandria*. Nat. ord. *Tricoccæ*, Linn. *Cucurbitaceæ*, Juſſ.

Gen. Ch. Male. *Cal.* very ſmall, with five teeth. *Cor.* monopetalous, funnel-ſhaped; tube ſlender, long, gradually leſſening downwards; border five-cleft; ſegments lanceolate-linear, obtuſe, obliquely and ſpirally revolute. *Stam.* filaments ten, at the top of the tube of the corolla; five alternate ones ſhorter; anthers oblong. Female. *Cal.* perianth ſmall, five-toothed, permanent. *Cor.* pentapetalous, Linn. Gært. five-cleft, Juſſ. Vent. Lam. petals or ſegments lanceolate-linear, very long, erect below the middle, reflected and twiſted above. *Piſt.* germ ſuperior, egg-ſhaped; ſtyles ſhort; ſtigmas five, oblong, expanding; widened, truncate, and crenulate at the ſummit. *Peric.* berry large, five-furrowed, one-celled, fleſhy. *Seeds* numerous, attached to five receptacles in the middle of the berry, oleaginous, egg-ſhaped, pointed, encloſed in a brittle, wrinkled tunic or aril.

Eſſ. Ch. Male. *Cal.* very ſmall, five-toothed. *Cor.* five-cleft, funnel-ſhaped. *Filaments*, in the tube of the corolla, alternately ſhorter. Female. *Cal.* five-toothed. *Cor.* five-petalled, or deeply five-cleft. *Stigmas*, five. *Berry* one-celled, many ſeeded.

Species, 1. C. *papaya*, Linn. Sp. Pl. (C. *vulgaris*, Encyc. Meth. Papaya carica, Gært. tab. 122. fig. 2. Lam. Illuſt. Pl. 821. Papaya-maram, Rheed. Mal. tab. 15. fig. 1. Ambapaya, tab. 15. fig. 2. Ababaye of the Caribs.) Common papaw tree. "Lobes of the leaves ſinuated." Somewhat the habit of a palm. *Root* perpendicular, whitiſh, ſpongy, of a diſagreeable taſte and ſmell. *Stem* twenty feet high, a foot thick, naked almoſt to the top, marked almoſt its whole length with the ſcars of fallen leaves, of a tender ſubſtance like that of the banana, ſolid towards the baſe, hollow in its upper part. *Leaves* on petioles near two feet long, the lower ones almoſt horizontal, upper ones erect, deeply divided into ſeven, nine, or eleven ſinuated and gaſhed lobes, alternate, near together. *Flowers* axillary, white, ſweet-ſcented; males in ſlender, pendulous racemes, two or three feet long; pedicels ſhort; females numerous, on ſhort ſimple peduncles. *Fruit* about the ſize of a ſmall melon; various in its form, ſometimes angular, and flattened at both ends, ſometimes oval or round, and ſometimes pyramidal, yellow when ripe; containing a yellow ſucculent pulp of a ſweetiſh taſte and aromatic ſmell. It is ſeldom eaten raw, but, when boiled, is eſteemed a wholeſome ſauce to any kind of freſh meat. It is alſo ſometimes pickled in vinegar, and is frequently preſerved in ſugar, and ſent to Europe with other tropical ſweetmeats. When ripened in our ſtoves, it does not acquire its proper flavour, and is even ſaid by Miller to be deteſtable. The whole plant abounds with a milky acrid juice. Male-flowers are occaſionally found on the female plants, and female on the male ones. A native of both the Eaſt and Weſt Indies. 2. C. *poſopoſa*, Linn. Sp. Pl. Feuillée Per. tab. 39. fig. 1. "Lobes of the leaves entire." *Stem* more frequently branched than that of the preceding. *Lobes* leſs divided, and often entire. A native of Surinam and Peru. 3. C. *ſpinoſa*, Gmel. Syſt. Nat. Encyc. Method. Aubl. Guian. ii. p. 908. tab. 346. "Leaves digitate; leaflets quite entire; ſtem with harmleſs ſpines." *Trunk* branched at leſs than a third of its height. *Leaflets* ſeven, ſmooth, pointed, green above, whitiſh underneath. *Berry* yellow, egg-ſhaped, ſmooth, marked with ſeveral longitudinal furrows; fleſh yellow, ſucculent. A native of Guiana and Brazil.

The firſt ſpecies only has been cultivated in Europe. It is eaſily propagated by ſeeds brought from its native climate, which ſhould be ſown in a hot bed early in the ſpring. When the plants are near two inches high, they ſhould be tranſplanted ſeparately into ſmall pots filled with a light, gentle, loamy ſoil, and plunged into a hot-bed of tanner's bark. As they advance in growth they will require larger pots and when they are too tall to remain under frames, they muſt be placed in the tan-bed of the ſtove, where they will grow to the height of near twenty feet in three years, and produce flowers and fruit. In every period of their growth they ſhould be ſparingly watered. Mart. Mil.

N. B. The annona triloba, trifid fruited cuſtard-apple, is alſo called the papaw-tree in the ſouthern ſtates of North America.

Carica, among *Ancient Naturaliſts*, denotes a kind of fig peculiar to Syria; ſometimes alſo the dried fig. It is alſo uſed in ancient writers to denote the fruit of the palm tree, otherwiſe called *cariata*, which was ſent annually by clients, on New Year's day, as a preſent or acknowledgment to their patrons.

Carica, in *Zoology*, a ſpecies of *Murex*, which ſee.

CARICATO, *Ital.* loaded; a term in *Muſic*, uſually applied to the baſe finger in an Italian burletta, as *Buffo caricato*; to a ſong of which the accompaniments are too full; or to any thing crowded or overcharged. See Chargé.

CARICATURA, in *Painting*, a loading, or exaggeration of the defects of an object repreſented, with a concealment of the beauties or advantages of it; yet ſo as ſtill to preſerve a reſemblance.

The word is Italian, formed of *carica*, a *load*, *burden*, or the like.

CARICOUS *Tumour*, in *Surgery*, is a fig-like excreſcence, (uſually named *ficus* by the moderns,) ſituated near the anus or pudendum, and frequently ariſing from illicit amours. See Ficus.

The etymology of the term *caricous* has been ſometimes miſtaken. It is derived from *carica*, a dried fig, and does not mean the ſame as καρυκοιδὲς; although the editors of a new medical and phyſical dictionary, copying the error of Quincy, ſay that "the caricous tumour is called by Hippocrates καρυκειδὲς:" whereas, this latter word (according to Galen, Suidas, Erotian, Heſychius, Philocrates, and others), denotes a kind of luxurious *ragoût*, compoſed of blood and various condiments, invented by the Lydians, and which Varinus ſuppoſes obtained the name of καρύκη, becauſe it was of a blackiſh colour, reſembling boiled walnuts. Vide Gorrhæi Def. Medic. Lexic. Schrevelii, and Œcon. Hippoc. Fœſii.

CARICUM, a cathæretic application for cleanſing for-did ulcers and eroding fungous fleſh. See Hippocrates de Ulceribus; and καρικὸν, in Galen's Exegeſis. It is prepared of black hellebore, ſandarach, *ſquama æris*, waſhed lead, ſulphur, orpiment, and cantharides; theſe being mixed, are made up with oil of cedar into a liquid medicine. Sometimes there is added arum, in decoction or juice, or the powder of it mixed with honey. The dry medicine or powder, for the ſame purpoſe, is prepared of the ſame ingredients, omitting the oil of cedar, and the honey: it is alſo made of black hellebore and ſandarach only.

CARICUS, in *Ancient Geography,* a river of the Peloponneſus, in Laconia.

CARIDES, or Carida, a town of Aſia Minor in Phrygia. Steph. Byz.

CARIDIEN, in *Geography,* an iſland of Aſia, in the Indian ſea, near the weſt coaſt of the iſland of Ceylon; 12 miles long and two wide. N. lat. 8° 30′. E. long. 79° 55′.

CARIEBOEF *mountains,* a ridge of mountains in the weſtern part of North America. N. lat. 58° 45′. W. long. 115°.

CARIES, in *Surgery,* is a term which implies a corruption or putridity of ſome part of the animal body: this word was uſed by the older ſurgeons, and eſpecially by thoſe of the middle age, to denote a foul or corroding ulcer of the genitals, ariſing from impure coition; but we now almoſt excluſively apply it to a diſſolution of the bony ſtructure, either in an actually dead ſtate, or tending to death. The moſt general diſtinction of *caries,* is into the *dry* and the *moiſt.*

The former ſpecies may beſt be compared with a dry Gangrene of the ſoft parts. The bone is white, dry, and dead, but otherwiſe ſmooth and even; no appearance of putreſcence, matter, or exulceration is viſible; only it is obſerved, that the bone is incapable of adhering to the ſurrounding ſoft parts, or when ſeparated from them, of again forming an adheſion with them. In the majority of caſes, this caries begins at the ſurface; much more rarely in the internal ſubſtance, of the bone. Sometimes it changes into the humid caries.

The *humid caries* is, with reſpect to a bone, the ſame as an ulcer with regard to the ſoft parts. In this diſeaſe the bone is yellow, brown, or black, corroded, uneven, partly conſumed, and a fetid matter iſſues from it. It is diſtinguiſhable into the *occult,* and the *open* caries.

In the firſt, the bone is ſtill covered with ſoft parts, and the external integuments are either entire, or there exiſts already an ulceration, which nevertheleſs does not lay the bone bare. In the firſt caſe the integuments over the diſeaſed part of the bone are waſted, relaxed, oedematous, red or livid; without, however, being inflamed. The patient conſtantly feels gnawing, lancinating pains in the bone below the part, which are increaſed by external preſſure; and when the diſeaſe of the bone is of any conſiderable extent, the patient is generally affected alſo with a ſlow hectic fever.

In the ſecond caſe, the ulcer in the ſoft parts is generally very obſtinate and of a foul appearance, without any manifeſt cauſe; it diſcharges a great quantity of very ill-conditioned matter, and it is relaxed and ſurrounded with fungous excreſcences. All endeavours to heal it prove ineffectual, or if it does ſkin over, it ſoon breaks out again; and frequently, when the cauſe of this obſtinacy is not diſcovered, theſe ulcers are conceived to be of a malignant and cancerous kind.

The open humid caries may be known by the more or leſs copious diſcharge, which has an intolerable and peculiar fœtor, ſtaining linen with black ſpots, and diſcolouring the ſilver probes that are introduced into it, and in which generally ſmall black particles are ſeen to float. The ulcer in the ſoft parts is relaxed, uninflamed, ſpongy, and much inclined to bleed, and the bone is entirely bare, ſoft, uneven, corroded, brown or blackiſh. Sometimes a great quantity of fungous fleſh grows out of the bone itſelf, which eaſily bleeds, covers the bone, and thus renders both the diagnoſis and the cure of the diſeaſe more difficult. This ſpecies of caries may be compared with fungous ulcers of the ſoft parts. In another ſpecies of caries, the bone ſeems to be gradually converted into muſcular ſubſtance.

The humid caries begins either in the inner part of the bone or at its ſurface. In the former caſe, the patient firſt experiences for a long time violent pains in the bone, which are not increaſed by external preſſure; after which, the bone becomes ſwelled, the diſeaſe makes its way through the bone, attacks the ſoft parts, and terminates in an open caries. This ſpecies of caries, which begins in the interior ſubſtance of the bone is far more dangerous than that which commences on its external ſurface; in other reſpects there is no material difference between the two ſpecies; for the internal caries is frequently produced by external cauſes, and the external caries may ſometimes proceed from internal cauſes. Caries is ſometimes combined with an enlargement of the bone, and that moſt frequently when the caries begins in the centre of the bone; however it occurs alſo not unfrequently in the caries which begins externally. This ſwelling, nevertheleſs, does not alter the character and manner of treating the caries; it may occur as well in a mild as in a malignant caries, and ſometimes after the original diſeaſe has been cured, the ſwelling may remain during the life of the patient.

Beſides theſe, ſeveral other ſubdiviſions of the caries may be enumerated; ſuch as,

1. The *gangrenous caries,* which is a variety of the dry caries. The colour of the bone is not much changed at firſt, but when the exfoliation begins, it becomes greyiſh, afterwards brown, and finally black. The exfoliation takes place more eaſily than in the other ſpecies of caries, after the manner of a perceptible exfoliation. The ſame alſo happens here which is obſerved in the ſeparation of gangrenous ſubſtance in the ſoft parts. (See the Art. Gangrene.)

2. Another variety of the humid caries is the *worm-eaten caries* of Petit, which may be compared with an ulcer of the ſoft parts, having many cavities, and when the diſcharge proceeds from corrupted marrow; or with an abſceſs, the matter of which oozes out through a number of ſmall orifices in the ſkin. The bone becomes ſpongy, and full of holes, but it is not very black. The diſcharge is copious, and generally it blackens ſilver probes. Portions of the bone ſeparate themſelves; however, no regular exfoliation takes place, unleſs this ſpecies of caries is changed by art into the above-mentioned gangrenous caries. The bone is gradually deſtroyed and conſumed by the ſuppuration, and it becomes ſo brittle that it can hardly be touched without breaking.

3. *The fungous caries* is in all reſpects ſimilar to the preceding, except that ſpongy fleſh, which readily bleeds, grows out of the carious bone.

4. The *phagedænic caries.* In this diſeaſe, the perioſteum is thickened, the bone becomes ſoft, and from its carious ſurface a fungous ſubſtance, of a red or yellow colour, ſprouts forth. When the diſeaſe ſpreads deeper, it gradually deſtroys all the oſſeous fibres. This ſpecies is diſtinguiſhed from the fungous caries mentioned above by the circumſtance, that in the latter the ſpongy fleſh proceeds from the holes of the bone, the edges of which, though diſcoloured, ſtill remain hard and oſſeous: whereas, in the phagedænic caries,

the oſſeous fibres diſappear wherever the fungous fleſh ſprouts out; ſo that, were we to depend entirely on the probe, it would be very difficult to determine whether the bone were carious or not. For when we rub it under the ſpongy fleſh, with the end of the probe, its ſurface, though uneven, does not ſeem to be very rough, neither can any conſiderable diſcoloration be perceived in it.

5. The *ſcrofulous caries* is diſcovered on opening a ſcrofulous abſceſs, when frequently the bone beneath, though of the natural colour and ſmooth, is found to be detached from all connection with the ſoft parts. Being now expoſed to the air, it gradually becomes diſcoloured, which circumſtance, as well as that it no where adheres to the ſubjacent parts, ſufficiently evinces that the circulation in it is interrupted. Another ſpecies of ſcrofulous caries is that which occurs in white ſwellings of the joints. (See White Swelling.)

6. The *cancerous caries* commences with an enlargement of the bone; which in ſome parts is ſoft, and its internal ſubſtance neither fibrous nor cellular, but ſeemingly compoſed of an irregular accumulation of oſſeous matter. It is covered with a tendinous or cartilaginous ſubſtance, from which a ſmooth fungous excreſcence grows out, and exudes a limpid, acrid and fetid ichor. The patient complains much of deep-ſeated, pulſating, and very acute pain; and the ulcer bleeds profuſely in conſequence of the gradual corroſion of the veſſels at its ſurface. This ſpecies of caries may be compared with a cancer of the ſoft parts, to which it alſo is frequently ſuperadded, when the cancer has ſpread itſelf as deep as the bone. (See Cancer.)

As a ſpecies of caries, may alſo be mentioned that gradual wearing away and conſumption of the bones, which takes place when they are expoſed to conſtant preſſure; as for example, in aneuriſms, hydrocephalus internus, &c.

The Necrosis is, indeed, generally conſidered as a diſeaſe of the bones diſtinct from caries; however, it may not improperly be looked upon as a ſpecies of the dry caries, with a total privation of the living principle.

In all caſes in which an ulceration of a bone diſcharges a large quantity of matter, the ſurgeon muſt not reſt till he has diſcovered and ſufficiently opened the ſource from whence the diſcharge proceeds. The humid caries ſpreads itſelf conſtantly farther and farther; and that the more rapidly, and in a more violent degree, the looſer the bone is, and the more the diſcharge of matter is obſtructed by any cauſe. Moreover, the conſequences of the humid caries are as various, and of the like nature, as thoſe of ulcers; for not only the functions of the diſeaſed part, but alſo thoſe of the neighbouring organs, are always more or leſs affected; the patient is weakened by the daily loſs of fluids; his blood is vitiated by the abſorption of the matter, and a hectic fever is produced, with a conſtant ſtate of erethiſm.

The moſt frequent cauſes of the dry caries are external injuries, whereby a bone is laid bare; and in conſequence of a deficiency of nutritious fluid, the acceſs of the external air, or the contact of vitiated juices, it loſes the living principle and dries up. In ſuch caſes it retains its vital powers longer in young ſubjects than in old. Sometimes this ſpecies of caries takes place ſpontaneouſly; probably when any pernicious acrimony, eſpecially of the arthritic or venereal kind, is depoſited upon the perioſteum.

The humid caries is produced by cauſes ſimilar to thoſe of ulcers in muſcular parts; and may even be produced by ſuch ulcers, when they penetrate as far as the bone. This caries may therefore be divided into as many ſpecies, as there are reckoned of ulcers, with reſpect to their cauſes; and of local cauſes the moſt frequent are the denudation, contuſion, and violent concuſſion of the bone.

The danger in caries depends, as in ulcers, upon the abſorption of unhealthy matter, the daily loſs of fluids, and the conſequent hectic fever; but in caries, the abſorption of matter takes place to a much greater degree, and is more pernicious, as the diſeaſe is deeper ſeated, and the matter extremely acrid and corrupted.

The prognoſis depends upon the ſituation or condition of the bones, the extent of the caries, its cauſe, and its duration. (See Ulcer.)

The dry caries requires for its cure that the dead ſubſtance be ſeparated from the living; and this is done either by a perceptible or imperceptible exfoliation, which is effected either by a chirurgical operation or the efforts of nature. When the ſurgeon foreſees that an exfoliation is about to take place, he muſt open the ulcer in the fleſh ſufficiently, and keep it open, in order that he may be able to extract the ſeparated portions of bone. But in an imperceptible exfoliation this is not neceſſary. A perceptible exfoliation generally takes place when the dead portion of bone is ſtrong and thick; but a thin layer of dead bone commonly exfoliates imperceptibly, as do looſe and ſpongy bones: hard and firm bones commonly exfoliate perceptibly. In young ſubjects the bone is more readily comminuted, and the imperceptible exfoliation is much more frequently obſerved, than in old ones. (See Exfoliation.)

In the perceptible exfoliation, the dead portion of bone firſt becomes whitiſh and dry; after ſome time it ſeems gradually to raiſe itſelf, and yields a ſort of hollow ſound, when ſtruck upon with a probe; at length a fiſſure is formed in the circumference of the dead part, which ſeparates the dead from the living portion of the bone. This fiſſure gradually becomes wider, and at the ſame time the piece of bone becomes more and more elevated; new fleſh is found between the living and dead bone, which as it riſes ſeparates the dead portion, until at length it grows looſe, and finally falls off. The bone beneath is then found covered with granulations which in ſome degree ſupply the place of the loſt portion of the bone, and in time become oſſified.

The exfoliation is entirely a work of nature, but the ſurgeon muſt promote it. He muſt firſt endeavour to remove the internal cauſe of the caries; then (if the exfoliation be judged inevitable), deſtroy completely the life of the diſeaſed portion of bone, and promote its ſeparation. The internal cauſes of caries are to be removed in the ſame manner as thoſe of ulcers. Externally may be applied ſtrong brandy, and various tinctures prepared with it. The diſeaſed portion of the bone is to be kept conſtantly wet with pieces of lint dipped in ſpirituous liquids. But when the diſeaſed portion of bone is ſo thick and ſtrong that it cannot be penetrated by theſe fluid applications, another mode of treatment is neceſſary. There are three different methods according to which we may proceed; but, of theſe, that which is moſt adapted to the peculiar circumſtances of the caſe muſt be choſen.

We may either burn the bone by applying a red-hot iron, or we may bore a number of holes, the more the better, (by means of a perforator or ſmall trephine), but ſo as never to pierce the ſound portion; in order that the above-mentioned remedies may be able to penetrate into and entirely dry out the bone; or we may remove, by means of a ſcraper, ſo much of the bone, that the remaining layer may eaſily be penetrated by drying remedies. It is however well to be attended to, that when the life of the bone is entirely deſtroyed, the drying remedies ſhould no longer be employed, as they then will anſwer no purpoſe, and at the commencement of the exfoliation will even be hurtful. Moreover theſe remedies ſhould come into contact with the whole circumference of the diſeaſed portion of the bone, but (if poſſible) not with any of the ſound part.

The firſt of theſe objects muſt be attained by laying bare the whole diſeaſed portion of the bone by means of inciſions; and the ſecond, by not laying the bone bare further than it is diſeaſed, or by covering the denuded ſound portion with lint ſpread with ſome emollient ointment, alſo by not inbuing the lint with ſo large a quantity of the drying remedies as will come into contact with the ſound parts, and by not uſing theſe remedies longer than is neceſſary. It is alſo particularly requiſite, when a red-hot iron is to be applied, that the carious part ſhould previouſly be well dried out, in order that the heated fluid may not come into contact with and deſtroy the ſound portion of the bone.

As ſoon as the life of the diſeaſed portion of the bone is completely deſtroyed, the ſurgeon uſually employs ſuch remedies as promote the exfoliation, ſuppuration, and growth of the new fleſh; ſuch, for example, as the balſ. Arcæi, either alone, or mixed with a little oil of turpentine, the ung. altheæ, or reſinæ flavæ, &c. Theſe remedies are applied warm; but in order that they may be able to penetrate to the living part of the bone, holes are bored into different parts of the diſeaſed portion with the perforator; and the more numerous and large theſe perforations are the better. Every hole, however, ought to penetrate as far as the living part, and we are directed by many ſurgeons to continue boring till ſome blood appears. As ſoon as this has been done, the bone muſt be covered with warm emollient applications. Should the exfoliation not take place under this treatment, we may conclude either that the diſeaſed portion of the bone is not entirely deprived of its life, in which caſe the application of the drying remedies muſt be repeated, or the cure is impeded by ſome internal cauſe, which muſt be diſcovered and removed. When the diſeaſed bone begins to grow looſe, it will be proper to ſhake it gently from time to time, without exciting, however, either pain or bleeding, in order to accelerate its ſeparation; and when the exfoliation has been completed, the ulcer is to be treated like a ſimple, clean abſceſs.

A much more ſpeedy and perfect cure, however, may be effected when the ſurgeon performs the ſeparation himſelf. This is particularly neceſſary when the diſeaſed portion of bone is very thick; but it is only admiſſible, when we have a free and unobſtructed acceſs to the whole circumference of the diſeaſed bone. According to the difference of the ſituation and form of the bone, the ſeparation of it is performed in different ways. When only a thin layer of bone is diſeaſed, it may be ſcraped off with the ſcraper, or with the exfoliative trepan, or ſtill more conveniently with a piece of glaſs. A thick layer of bone is to be ſeparated with the chiſel and hammer; and that this may be done without uſing great force, or producing a violent concuſſion, the bone muſt be previouſly bored through with the perforator; we muſt alſo only attempt to chiſel off ſmall pieces at a time; and that the whole of the diſeaſed portion has been removed, we may know by the whole ſurface of the bone becoming red and bloody. When the bone is flat, and diſeaſed through and through, we may apply the trepan, and in cylindrical bones we may ſometimes ſaw off the diſeaſed portion. A bone that is diſeaſed throughout muſt be extracted. As ſoon as the whole of the diſeaſed portion has been ſeparated the remaining part is to be treated like a ſimple wound, and the bone is to be dreſſed with emollient warm applications, under the uſe of which it generally becomes covered with fleſh in a ſhort time. In order that it may not again become diſeaſed, it muſt be carefully defended againſt the cold, air, and ſpirituous ſubſtances. In many caſes the ſurgeon cannot remove the whole of the diſeaſed portion of the bone, and in this caſe he muſt combine the two methods of cure with each other; that is, he muſt remove the greater part of the diſeaſed bone, entirely deſtroy the life of that which is left behind, by the application of the remedies formerly mentioned, then perforate according to Beloſte's method, and dreſs the part with emollient applications.

The method of cure in the humid caries is nearly the ſame as that uſed in the dry; only in the former it is neceſſary that the diſcharge ſhould be diminiſhed, its condition improved, and at length that it ſhould be dried up; ſince, till that has been done, no exfoliation can take place. If it proceeds from an internal cauſe, this muſt, if poſſible, be removed. Thus a cure is frequently obtained; however not always, for often the caries remains in conſequence of local cauſes, in which caſe it muſt be treated as a local diſeaſe. In this caſe the ſurgeon muſt promote the evacuation of the matter by every means in his power; he muſt lay the bone ſufficiently bare by means of inciſions; the limb muſt be kept in a dependent poſition; and the ulcer covered with light dreſſings, in order that the thinner part of the diſcharge may run through; and in general every thing which might occaſion a ſtagnation and accumulation of the matter in the ulcer muſt be moſt carefully avoided. But when the bone ſwells, and a quantity of matter is diſcharged from the ulcer, diſproportionate to its apparent magnitude, ſo that we have reaſon to conclude the matter ſtagnates in the fungous ſubſtance, or hollow of the bones, and there carries on its ravages in ſecret, the bone muſt be laid open in time by means of the trepan or perforator. Moreover, in all caſes of humid caries, it is very uſeful to dreſs the ulcer with ſponge or dry lint.

When the caries penetrates deep into the bone, we may apply ſpirituous tinctures and fomentations externally; but in uſing theſe remedies, the directions which we have formerly given are to be obſerved.

Of the internal remedies which contribute to improve the condition of the diſcharge, aſa fœtida has been recommended in the form of pills as one of the moſt efficacious; as it generally deprives the matter in a few days of all its fetor and acrimony, and thus ſometimes is alone ſufficient to produce the exfoliation and cure. In obſtinate caſes of caries, good effects have been produced by the uſe of lime-water, hemlock, oak-bark, cinchona, and opium taken freely; but we are, nevertheleſs, too often diſappointed in our expectations from medicine, and no one plan will be efficient in all ſuch caſes. And, whatever plan may be adopted, it will be at the ſame time particularly neceſſary to breathe a pure air, and uſe an appropiate diet.

When the cauſe of the caries has been removed, and the condition of the diſcharge improved, the exfoliation and cure are ſometimes promoted by the judicious application of a bandage to the part.

Should the means that have already been mentioned be found inadequate to produce the deſired effect, the ſurgeon is obliged to have recourſe to more powerful ones; in order thereby to convert, as it were, the humid caries into the dry, and to accelerate the exfoliation and cure; for this purpoſe a red-hot iron is often our only reſource. As an excellent remedy againſt caries, Mr. Lentin recommends phoſphoric acid, prepared according to Gren's method. One part of this to be mixed with ſeven parts of diſtilled water, and applied to the bone itſelf, or uſed as an injection. Internally, the pure phoſphoric acid has been adminiſtered, in doſes of 10, 15, to 20 drops, thrice a day, in water, or a linctus.

Sometimes Mr. Lentin added a little myrrh to it, for external application; or mixed the phoſphoric acid with an infuſion of ſabine, ſcordium, or cort. ſalicis.

When the diſeaſed bone is covered with much fungous fleſh, this muſt firſt be removed by means of cauſtic applications, in order that it may not obſtruct the operation of the red-hot iron on the bone. When the caries penetrates ſo deep into the bone that the operation of the cautery does not extend quite through it as far as the bone, a part of the diſeaſed portion may be removed with the ſcraper, or the chiſel and hammer. In flat bones, under which important parts are ſituated, as, for example, the cranium, the application of the red hot iron muſt either be omitted or performed with great caution. When any of theſe means have been applied to a ſufficient extent, the ſurgeon muſt treat the diſorder as a dry caries. If exfoliation does not commence within the ſpace of about 20 days, the remedies muſt be renewed. When exfoliation has completely taken place, and the bone ſituated below the ſeparated portion becomes covered with ſound fleſh, the cure is completed; but if it remains bare, or is covered with fungous fleſh, it is ſtill diſeaſed, and muſt be touched either with Beloſte's liquor, or the actual cautery.

When the caries is of great extent, and penetrates deep into the bone, the beſt method will be to remove the diſeaſed portion of the bone, either entirely or in part, by means of chirurgical inſtruments; and the manner in which this may moſt conveniently be done, will depend upon the circumſtances of each particular caſe. If the caries be entirely confined to the ſurface of the bone, the damaged portion may be removed with the ſcraper, or the exfoliating trepan, or a piece of glaſs. The chiſel and hammer are required when it penetrates deep into the bone; the trepan may be uſed when it penetrates into the medullary cavity, or the cellular ſubſtance of the bone. If the whole bone be diſeaſed throughout, the external teguments muſt be laid open, and the bone extracted. In other particulars the ſurgeon has to proceed in the manner above directed.

Caries ſometimes renders it neceſſary that the limb ſhould be amputated; namely, when a bone of one of the extremities is either entirely, or particularly at the joint, carious through and through; and eſpecially when the muſcular and more important parts are in a great meaſure affected by the diſeaſe of the bone, and either corroded or deſtroyed, as may happen in what is named the Cancerous caries. It has, however, been obſerved, that, after this operation has been performed, the diſorder often breaks out in ſome other part, and renders all medical aſſiſtance ineffectual. If, on the contrary, the muſcular parts have ſuffered but little, although the bone is very carious, amputation ought not to be performed; but all that the ſurgeon can and ought to do, will be to lay bare the whole of the diſeaſed bone by inciſions, and to ſeparate it from the ſoft parts with the ſcalpel, and from the ſound portion of the bone with the ſaw. In theſe caſes, nature ſometimes ſupplies the portion of the bone that has been loſt, and though this ſhould not happen, the operation above mentioned is ſtill preferable to amputation in this particular caſe.

Neither is amputation always admiſſible when the caries proceeds from ſome internal cauſe, and this has not been removed. It muſt alſo be avoided when the patient is already greatly exhauſted by the diſeaſe: however, the ſurgeon need not be deterred by the mere preſence of hectic fever; as this ariſes principally from the irritation or abſorption of matter, and diſappears, together with its cauſe, after the operation has been performed. It alſo happens, not unfrequently, in caſes of old caries, in which the conſtitution has become accuſtomed to the diſcharge, that troubleſome ſymptoms ſupervene upon amputation, which perhaps may be prevented by means of iſſues.

When the carious bone is covered with a great deal of fungous fleſh, deſiccative remedies and preſſure muſt be applied; and ſhould theſe not prove ſufficient to extirpate it, we muſt uſe a cauſtic, or the actual Cautery. In theſe caſes there is generally alſo ſome internal cauſe preſent, which we muſt endeavour to remove by means of appropriate internal remedies. In that ſpecies of caries in which the bone is converted into a kind of fleſhy ſubſtance, the internal and external uſe of lime-water has been found beneficial; the ſurgeon muſt, however, always attend at the ſame time to the internal cauſe. See Osteosarcosis.

Concerning that ſpecies of caries which begins in the internal ſubſtance of the bone, ſee Spina *Ventoſa* and Necrosis; and for the venereal caries, ſee Syphilis. Likewiſe, concerning carious teeth, we refer to the article Teeth. See alſo *Diſtortion of the* Spine.

Although we have here laid down the rules of practice, which the generality of ſurgeons follow in the treatment of caries, it muſt ſtill be acknowledged that no ſubject in the whole compaſs of the art is more liable to obſcurity and debate. The modes of treatment adopted by one ſurgeon, will be often regarded as either uſeleſs or pernicious by another; ſo that while we are obliged to deſcribe certain plans of chirurgical management, it is with a full conviction that no one method will be univerſally approved. The following remarks of M. Boyer, of Paris, are ſubmitted to our readers, as deſerving their attention, and as being among the lateſt with which the public have been favoured by any ſyſtematic writer.

"There is perhaps," ſays he, "no diſeaſe in which the indications of cure are more vague than in caries, and none in which the treatment is leſs regular. The ancients preſcribed unctuous or relaxing applications, but they preferred acrid irritating ſubſtances, ſuch as the powder of euphorbium, tincture of aloes and myrrh, oil of turpentine, mineral acids, cauſtic alkali, or even the actual cautery. Monro, Tenon, and, in imitation of them, ſome modern practitioners, have preferred the uſe of unctuous and emollient applications; but, in order to diſcover the preferable mode of treatment, it is neceſſary to take a cloſe view of the evil againſt which it is to be directed. We muſt then conſider, that a bone affected with caries is a prey to a morbid action of its own parts, and that this action creeps from one part to another, and pervades the whole with greater or leſs rapidity, if art does not come to the aſſiſtance of nature to arreſt its progreſs.

"If the caries be produced by ſome affection of the ſyſtem, this ſhould be aſcertained and combated with appropriate remedies. Thus the uſe of mercurial and ſudorific medicines arreſts the progreſs of caries proceeding from the venereal diſeaſe, and aids nature in ſeparating the unſound from the ſound part. The uſe of ſpirituous drinks, vegetable diet, and acids, removes at once ſcurvy and the caries, to which it had given riſe, &c. &c. But if it has been occaſioned by an external cauſe, or if it has remained after the internal one has been removed, ſo as to be reduced to the ſtate of a mere topical affection, its progreſs may be arreſted, and the ſeparation of the diſeaſed parts facilitated by the uſe of ſuch ſubſtances as ſtimulate the parts, or ſuch as abſorb and neutralize the fluids which tend to propagate the morbid action. Thus the deſiccation of a carious ulcer has been effected by the uſe of an abſorbing powder and pledgets of lint that had been dipped in tincture of aloes and myrrh.

"If theſe remedies be found ineffectual, recourſe muſt be had to more active ones: a pledget of lint dipped in a ſolution of nitrate of ſilver, may be applied on the carious part, and renewed every day. This portion of the bone is by this means quickly dried up, and reduced to the ſtate of a ſimple necroſis; the propagation of the morbid action is arreſted, and nature effects a ſeparation of the diſeaſed parts. It will not be amiſs, however, to move frequently the dried piece, and it may be neceſſary to prevent the fungous fleſh from ſpreading ſo as to impede the exfoliation. The ulcer heals after the exfoliation has taken place, and the cicatrix is more or leſs deep, and of a red colour, not blackiſh and livid, as a cicatrix formed over a diſeaſed bone.

"If the caries be very humid, that is, if a great quantity of ſanies flow from it, theſe remedies, even the mercurial nitrate, will be of no effect. The ſanies waſhes the pledget, and dilutes the cauſtic ſo much, that its action is conſiderably enfeebled. Cauſtic potaſh would be ſubject to the ſame inconvenience. In theſe caſes, the actual cautery is a remedy to be preferred to all others: by its action the carious part is in an inſtant reduced to the ſtate of an inorganic dry ſubſtance, and the caries thus converted into necroſis. This remedy is applicable to every caſe of humid caries where the ſurrounding ſoft parts have not a manifeſt tendency to cancer. Sometimes, however, the ſoft parts ſurrounding a carious bone have that tendency in ſo advanced a degree, that the actual cautery would neceſſarily occaſion the developement of that morbid ſtate. The general rules to which the uſe of the actual cautery may be reduced are as follow:

"In the firſt place, all the carious part of the bone muſt be laid bare, whether by cutting away the ſoft parts, or deſtroying them by cauſtic. The latter method being tedious, inconvenient, and uncertain, ſhould not be uſed unleſs when the patient will not ſubmit to the uſe of the knife. The bone being in this manner laid bare and ſcraped, the ſurgeon provides himſelf with ſeveral cauterizing irons of the ſame form, becauſe the application of one is ſeldom ſufficient. It will alſo be neceſſary to provide a number of canulæ when the cautery is to be applied on a bone from about which the ſoft parts cannot be completely raiſed, as, for inſtance, on the os coccygis, or ſacrum: by means of theſe canulæ, the hot iron can be introduced without injuring the ſoft parts. In every caſe it will be neceſſary to protect the ſurrounding parts as much as poſſible from the action of the cautery.

"The iron, whatever may be its ſize, ſhould be heated white, as the hotter it is the more rapid and leſs painful is its action. On the inſtant of its application, a black thick ſmoke riſes from the ſurface of the burning bone, the ſmell of which reſembles exactly that of burning horn: the great quantity of ſanies quickly diminiſhes the heat; for which reaſon a ſecond is to be immediately applied with the ſame precautions; and a third, if the two preceding have not burned deep enough. Care ſhould be taken to extirpate the diſeaſe by burning every part that is affected; and if the uſe of the cautery has not always had the ſucceſs expected from it, the failure of it is to be attributed to the timidity of the operator. A carious bone becomes worſe by the application of the actual cautery, if the evil be not entirely rooted out; juſt as a cancerous tumour becomes irritated, and makes a more rapid progreſs, if imperfectly cauterized.

"The actual cautery acts by evaporating the noxious fluids in which the carious bone was immerſed; by changing the caries into necroſis, and by irritating the ſubjacent ſound parts, and exciting that action of the veſſels by which the dead part of the bone muſt be thrown off.

"It is almoſt ſuperfluous to remark here, that this operation cannot be undertaken with any hope of ſucceſs, if the internal cauſe of the caries ſtill exiſt." Boyer's Diſeaſes of the Bones, vol. i. p. 334, & ſeq. edit. Lond. 1804.

CARIGE, in *Ancient Geography*, a town of India, on this ſide of the Ganges. Ptolemy.

CARIGNAN, in *Geography*, a town of France, in the department of the Ardennes, and chief place of a canton, in the diſtrict of Sedan, formerly a provoſtſhip, called "Ivoy," belonging to the dukes of Luxemburg, the dukes of Burgundy, and the houſe of Auſtria, but at length ceded to Louis XIV., who changed the name, and erected it into a duchy; three leagues E.S.E. of Sedan. The place contains 1500, and the canton 10,923 inhabitants: the territory comprehends 225 kiliometres and 27 communes.

CARIGNANO, a town of Piedmont, in the diſtrict of Savigliano, and capital of a principality, to which it gives name, ſeated on the Po, over which it has a handſome bridge. It gives the title of princes to a collateral branch of the houſe of Savoy. This town was plundered and burned by the French in 1536, and in 1544, the fortifications, except the citadel, were razed, and moſt of the churches deſtroyed. It is about 10 miles S. of Turin. N. lat. 44° 30′. E. long. 7° 25′.

CARIGNANO, a town of the iſland of Sardinia; 15 miles W.N.W. of Terra Nuova.

CARIGUE, an iſland in the river Shannon, on the coaſt of the county of Kerry, Ireland, oppoſite to Scattery Iſland. Near it are the ruins of Carrigfoil caſtle, once a place of great ſtrength, the lands belonging to which were granted to Trinity College, Dublin.

CARIGUEIA, in *Zoology*. See DIDELPHIS *Opoſſum*.

CARIGUEIBEIU. See MUSTELA *braſilienſis*.

CARILLÆ, in *Ancient Geography*, a town of Italy, mentioned by Silius Italicus, and ſuppoſed to belong to the Picentini, who inhabited the diſtrict now called Principato Citra.

CARILLONS, a ſpecies of chimes frequent in the Low Countries, particularly at Ghent and Antwerp, and played on a number of bells in a belfrey, forming a complete ſeries or ſcales, of tones and ſemitones, like thoſe on the harpſichord and organ. There are pedals communicating with the great bells, upon which the *carilloneur* with his feet plays the baſe to ſprightly airs, performed with the two hands upon the upper ſpecies of keys. Theſe keys are projecting ſticks, wide enough aſunder to be ſtruck with violence and velocity by either of the hands edgeways, without the danger of hitting the neighbouring key. The player is provided with a thick leather covering for the little finger of each hand, to guard againſt the violence of the ſtroke. Theſe carillons are heard through a large town.

*Carillon* is likewiſe the name of a ſmall keyed inſtrument to imitate a peal of hand bells. The tones are produced by box hammers ſtriking iron bars of different lengths. Handel uſed to accompany his air in Milton's Allegro, "Or let the merry bells ring round," on this inſtrument. And in Saul, the chorus "Welcome, welcome, mighty king."

CARILLONEUR, the muſician who plays the carillons, or chimes with hands and feet; an office of extreme labour, peculiar to Holland and the Netherlands.

CARILLONEUR of Buffon, in *Ornithology*, the chiming thruſh, TURDUS *tintinnabulatus*.

CARILOCUS, in *Ancient Geography*, now *Charlieu*, a town of Gaul, belonging to the Ædui. Ptolemy.

CARIM-CURINI, in *Botany*, Rheed. Mal. See JUSTICIA *echolium*.

CARIMGOLA, Rheed. Mal. See PONTEDERIA *vaginalis*.

CARIMON, in *Geography*, one of the chief towns in the kingdom of Yohor, which occupies the ſouthern extremity of the Cherſoneſe, in the peninſula of Malaya, or Malacca.

Carimon *Java*, a cluſter of iſlands in the Indian Sea. S. lat. 5° 48′. E. long. 109° 15′.

CARIMPANA, in *Botany*, Rheed. Mal. See Borassus *flabelliformis*.

CARIM-TUMBA, Rheed. Mal. See Nepeta *malabarica*.

CARINA, a Latin term, properly ſignifying the keel of a ſhip, or that long piece of timber running along the bottom of a ſhip, from head to ſtern; upon which the whole ſtructure is built, or framed.

Carina is alſo frequently uſed for the whole capacity or bulk of a ſhip; containing the hull, or all the ſpace below the deck. Hence the word is alſo ſometimes uſed, by a figure, for the whole ſhip.

Carina is alſo uſed in the ancient *Architecture*. The Romans gave the name carina to all buildings in the form of a ſhip, as we ſtill give the name nave to the middle or principal vault of our Gothic churches, becauſe it has that figure.

Carina, among *Anatomiſts*, is uſed to denote the *ſpina dorſi*. As likewiſe for the fibrous rudiments, or embryo of a chick, appearing in an incubated egg. The carina conſiſts of the entire *vertebræ*, as they appear after ten or twelve days incubation. It is thus called, becauſe crooked, in form of the keel of a ſhip.

Carina, in *Botany*, Eng. keel. A name given to the loweſt petal of a papilionaceous flower which generally encloſes the ſtamens and piſtil, in alluſion to its ſhape, which has ſome reſemblance to that of a boat. It ſometimes conſiſts of two diſtinct pieces, but is generally ſimple, attached to the receptacle, and firmly locked in with the other petals by two long claws. A leaf, a ſcale, and a nectary are alſo ſaid to be carinated, or keel-ſhaped, when they are longitudinally hollow above, and have a correſponding, ſharpiſh protuberance underneath.

Carina is alſo uſed by ſome *Chemiſts*, for the twentieth part of a drop.

Carinæ were weepers, or women hired, among the ancient Romans, to weep at funerals: they were thus called from *Caria*, the country whence moſt of them came.

Carina, in *Ancient Geography*, a town of Aſia, placed by Ptolemy in Media.—Alſo, a town of Aſia Minor in Myſia, or in the Æolide; mentioned by Herodotus.—Alſo, a town of Aſia, in Phrygia, towards Galatia. Pliny.—Alſo, a mountain of the Iſle of Crete, which, according to Pliny, was nine miles in circuit.

CARINACOU, in *Geography*. See Cariacou.

CARINANA, Carinena, or Sarignena, a town of Spain in Arragon, about 4½ miles from Longaris, containing 2036 inhabitants, and two convents.

CARINENTA, in *Entomology*. See Papilio.

CARINI, in *Ancient Geography*, a people of Germany, being part of thoſe who were comprehended under the general name of Vandals, and whoſe habitation was near the Codanus Sinus. Pliny.—Alſo, a people of Germany, in the vicinity of the Helvetians.—Alſo, a people of ancient Britain, called *Careni*, which ſee.

Carini, in *Geography*, a town of Sicily, pleaſantly ſituate in a fertile valley, ſurrounded by high rocks, and in a well cultivated diſtrict, abounding in wine, grain of various kinds, olives, and all ſorts of fruit. The town is ſingularly neat, contains 4000, (Swinburne,) or 7000, (De Non,) inhabitants, and gives title of prince to the family of Grua, who inhabit an old Gothic caſtle ſeated on a rock. It is diſtant one mile from the ſea-ſhore, and 18 miles from Palermo. The adjacent territory produces a great quantity of excellent manna, as well as oil and wine. A long ridge, like a rampart, and ſome remnants of a wall, are ſaid to indicate the ſite of "Hiccara," a city mentioned by Thucydides, as the birth-place of Lais, the moſt celebrated courtezan in Grecian hiſtory, who was carried off when Nicias the Athenian general landed here in his way from Italy, plundered the town, and ſold the inhabitants for ſlaves. Near the land, at ſome diſtance round the bay of Carini, lies the Iſole delle Femine, formerly a place of baniſhment for criminals.

CARINISH Point, a cape of Ireland weſt of Ballydonegan bay, in the county of Cork, and a little eaſt of Durſey Iſland. It is more frequently called Carinam. N. lat. 51° 34′. W. long. 10° 1′.

CARINOLA, a town of Naples, in the country of Lavora, the ſee of a biſhop, ſuffragan of Capua; 15 miles N. E. of Capua.

CARINTHIA, a duchy of Auſtria, bounded to the eaſt by Stiria, to the north by the ſame, and the archbiſhopric of Salzburg, to the weſt by Tyrol, and to the ſouth by the republic of Venice and Carniola. It derives its name from the ancient Carni, who were a colony of the Celtes, called in later times Carantani and Carinthi; and it was formerly a part of Carnia and Noricum. The country is very mountainous and woody. Its principal mountains are St. Ulrich, St. Helena, St. Veit, St. Laurence, and the mountain of Loihl, which ſeparates Carinthia from Carniola. There are alſo others, no leſs lofty, that lie towards Tyrol. Theſe mountains yield very good iron; the iron-mines near Frieſach on the north, and in the tract among the ſprings of the Lyſer, being particularly famous. In the diſtrict of Villach are found rich lead mines, a beautiful blue granite, and fire marble, or lumachelli. The fertile dales of this country produce wheat and other corn, but not enough for the ſupply of the inhabitants. Carinthia has a number of lakes, the largeſt of which is that called Wordtſee, eight miles long, and abounding in fiſh, and alſo many rivers, the principal of which are the Drau, iſſuing out of Tyrol, and traverſing Carinthia from eaſt to weſt; the Gail, the Moll, the Lyſer, the Glan, the Gurk, and the Lavant. The cities of Carinthia, of which Clagenfurth is the capital, are eleven; its market-towns 25; its villages, &c. 28,000; its houſes 49,000; its convents 20; clergy 1010; nobles 386; burghers and tradeſmen 4,753; peaſants 27,013; herds of oxen 50,000; proteſtants, with Upper Stiria, 17,000. The inhabitants are partly deſcended from the ancient Germans, and partly from the Wends. The archbiſhop of Salzburg, and the biſhop of Bamberg, have conſiderable territories in this country. The principal manufactures of the country are thoſe of iron and ſteel. In 1282 the emperor Rudolph I. conferred this duchy as a fief on the count of Tyrol, who entered into a compromiſe with Albrecht of Auſtria, by virtue of which, it was to deſcend, on the extinction of his male iſſue, to the heirs of Albrecht; and when this happened, in the year 1331, the emperor Lewis of Bavaria recognized this duchy to the Auſtrian duke Otto, who, in 1335, was inveſted with it. The duchy is governed by a land-captain; and to the military ſtate of the houſe of Auſtria it has been accuſtomed to contribute annually 637,695 florins. Chriſtianity was introduced into this duchy in the 7th century; and the whole country acknowledges the Roman Catholic church, though it contains many proteſtants and adherents to the Lutheran doctrine.

Carinthia is divided into Lower and Upper. The principal towns of Lower Carinthia, are Clagenfurth, the capital, St. Veit, Frieſach, Volken, St. Andree, Wolfsberg, and Gurk; and thoſe of Upper Carinthia are Villach and Gmund.

CARINUS, in *Biography*, a Roman emperor, was the eldeſt ſon of the emperor Carus, who, ſoon after his father's election, in the year 282, was admitted, together with his brother Numerian, to a participation of the imperial power; and both, being arrived at manhood, were honoured with the title of Cæſars. Carinus was extremely vicious from his youth, and devoted to diſſolute pleaſures. He was, however, valiant and active; and, therefore, when his father departed for the proſecution of the Perſian war, the young prince was directed, firſt to ſuppreſs ſome troubles which had ariſen in Gaul, and afterwards to fix the ſeat of his reſidence at Rome, and to aſſume the government of the weſtern provinces. Upon the death of Carus, near the cloſe of the year 283, the two brothers, Numerian and Carinus, were unanimouſly acknowledged as Roman emperors. Born and educated in a private ſtation their ſudden elevation required an uncommon ſhare of virtue and prudence; but Carinus was ſingularly deficient in theſe qualities. On his arrival at Rome from the Gallic war, he abandoned himſelf to the luxury of the capital. He blended in his character effeminacy with cruelty, a love of pleaſure with a groſs and indiſcriminating taſte, and an indifference to public eſteem with conſummate vanity. In the courſe of a few months he ſucceſſively married and divorced nine wives, moſt of whom he left pregnant; and whilſt he wallowed in the groſſeſt pleaſures, he beheld with inveterate hatred thoſe who might remember his former obſcurity, or cenſure his preſent conduct. He baniſhed, or put to death, the friends and counſellors of his youth; and whilſt he affected an arrogant and regal demeanour among the ſenators, he ſelected his favourites, and even his miniſters, from the dregs of the populace. The palace, and even the imperial table, were filled with ſingers, dancers, proſtitutes, and all the various retinue of vice and folly. Before the death of his father, the conduct of Carinus had filled him with ſhame and regret, and he determined to ſet him aſide, and to adopt in his place the brave and virtuous Conſtantius, who was at that time governor of Dalmatia. But a ſudden death prevented the execution of his purpoſe, and afforded his worthleſs and degenerate ſon an opportunity of diſplaying to the Romans the extravagancies of Elagabalus aggravated by the cruelty of Domitian. The unreſtricted profuſion with which he indulged his propenſity to every kind of pleaſure, ſupplied him with the means of exhibiting the Roman games of the theatre, the circus, and the amphitheatre, with uncommon ſplendour; and the vain prodigality which he manifeſted in this way was enjoyed by the Roman people with ſurpriſe and tranſport. Upon the death of Numerian, Diocletian was elected emperor by the Roman army, aſſembled at Chalcedon; and the new emperor, fully apprized of the general diſſatisfaction occaſioned by the conduct of Carinus, made preparation for a civil war. In the ſpring of the year 285, the forces of the Eaſt and Weſt encountered each other in the plains of Margus, a ſmall city of Mœſia (now Servia), in the neighbourhood of the Danube. The Eaſtern army had been reduced in number, and its ſtrength had been exhauſted; ſo that it was not in a condition to contend with the legions of Europe. Its ranks, on the firſt onſet, were broken, and Diocletian deſpaired of the purple and of life. But the advantage which Carinus had obtained by the valour of his ſoldiers, he ſoon loſt by the infidelity of his officers. A tribune, whoſe wife the licentious emperor had ſeduced, ſeized the opportunity of revenge, "and by a ſingle blow, (ſays Gibbon,) extinguiſhed civil diſcord in the blood of the adulterer." Crevier's Rom. Emp. vol. ix. Gibbon's Hiſt. vol. ii. chap. 12.

CARIOLE, a name given by the Canadians to a ſledge, by which they tranſport themſelves over the ſnow, from place to place, in the moſt agreeable manner, and with a degree of celerity that appears almoſt incredible; for, with the ſame horſe, it is poſſible to go 80 miles in a day, ſo light is the draft of one of theſe carriages, and ſo favourable is the ſnow to the feet of the horſe. This cariole will hold two perſons and a driver, and is uſually drawn by one horſe. Its ſhape is varied according to the fancy and taſte of the owner. Some are open, and others covered. The former is commonly like the body of a capriole, put upon two iron runners or ſlides, ſimilar in ſhape to the rim of a pair of ſkates: the latter conſiſts of the body of a chariot put on runners in the ſame manner, and entirely covered with furs. The carioles glide over the ſnow ſo ſmoothly and with ſo little noiſe, that it is neceſſary to have a number of bells attached to the harneſs, or a perſon continually ſounding a horn to guard againſt accidents. The rapidity of the motion, and the ſound of theſe bells and horns, conduce much to cheerfulneſs, for you ſeldom ſee a dull face in a cariole. Weld's Travels, vol. i. p. 392.

CARIOPHYLLUM *Saxeum*, in *Zoology*, one of the ſynonymous names of *madrepora faſcicularis*, Gmel.

CARIOUS, the ſtate of a bone putrefied or rotten. See Caries.

CARIPI, a kind of cavalry in the Turkiſh army. The caripi, to the number of about 1000, are not ſlaves, nor bred up in ſeraglios or ſeminaries, like the reſt; but are generally Moors, or renegado Chriſtians, who, having followed adventures, and being poor, and having their fortune to ſeek, by their dexterity and courage have arrived at the rank of horſe guards to the grand ſignior. They march with the Ulufagi on the left hand, behind him: their pay is twelve aſpers per day.

The word *caripi* ſignifies *poor* and *ſtranger*; an appellation ſaid by Chalcondylas to have been given them, becauſe chiefly brought out of Egypt, Africa, &c.

CARI-PIRA, in *Ornithology*, one of the ſynonyms of the great frigate bird; *pelecanus aquilus*, Linn. which ſee.

CARIPOUS, in *Geography*, a people of South America, inhabiting a country to the north of the river Amazon; who are at perpetual war with the Caribbees.

CARIS, in *Ancient Geography*, now *le Cher*, a river of Gaul, called alſo *Carus*.—Alſo, one of the names of the iſle of Cos.—Alſo, a town of Phrygia. Steph. Byz.

CARISBROOK *Caſtle*, in *Geography*, an ancient caſtle in the iſle of Wight, near Newport, where king Charles I. was impriſoned thirteen months. It has a governor and a garriſon.

CARISSA, in *Botany*, Linn. Mant. 52. Schreb. 413. Lam. Ill. 330. Willd. 473. Juſſ. 149. Vent. vol. ii. 431. (Calac. Encyc. Nouv. Hiſt.) Claſs and order, *pentandria monogynia*. Nat. ord. *Contortæ*, Linn. *Apocinæ*, Juſſ.

Gen. Char. *Cal.* very ſmall, five-cleft, acute, permanent. *Cor.* monopetalous, funnel-ſhaped; tube much longer than the calyx, cylindrical, ſomewhat ventricoſe at the throat; border five-cleft, ſpreading; ſegments oblong, acute, ſhorter than the tube. *Stam.* filaments five, very ſhort at the top of the tube; anthers oblong, within the throat. *Piſt.* germ ſuperior, roundiſh; ſtyle thread-ſhaped, the length of the tube; ſtigma thickiſh, ſlightly bifid. *Pericarp.* berry ſomewhat globular, ſmall, two-celled; partition thin, membranous. *Seeds* ſolitary, or two together, egg-ſhaped, ſomewhat compreſſed.

Eſſ. Char. *Calyx* ſhort. *Corolla* funnel-ſhaped. *Berry* two-celled. Lam. Illuſt.

* *Thorny.*

Species, 1. C. *carandas*, Linn. Mant. p. 52. Lam. Illuſt. Pl. 18.

Pl. 118. fig. 1. (Echites ſpinoſa, Burm. Ind. 69. Carandas, Rumph. Amb. vii. p. 57. tab. 25. Lycium Malabaricum, Pluk. Alm. tab. 305. fig. 4.) "Leaves elliptical, obtuſe." Linn. "Leaves egg-ſhaped, mucronate, reticularly veined; ſegments of the corolla lanceolate." Willd. A ſhrub. *Stem* fifteen feet high, much branched; branches generally furniſhed at their knots with ſtraight, ſtiff, oppoſite, ſpreading ſpines, often ſimple, ſometimes bifid, not perfectly axillary. *Leaves* oppoſite, entire, ſmooth, a little coriaceous, on very ſhort petioles. *Flowers* white, reſembling thoſe of the common jaſmine; peduncles generally trifid. *Berry* dark red, of a pleaſant acidulous flavour. La Marck, from a dried ſpecimen. The ſpecimen from which Willdenow formed his deſcription has mucronate leaves; but in La Marck's figure they are perfectly obtuſe and entire. A native of the Eaſt Indies, where it is made into an excellent ſweetmeat. Loureiro found, on the eaſt coaſt of Africa, a plant which he ſuppoſes the ſame; but, if his deſcription be accurate, it muſt not only be a different ſpecies, but will require a ſmall alteration in the generic character. It is a ſmall tree, about ſix feet in height, with twiſted, ſpreading, dichotomous branches; branched, not ſimply; dichotomous ſpines; egg-ſhaped, acute leaves, and a *one-celled* berry, containing many roundiſh imbricated ſeeds. 2. C. *ſalicina*, Lam. Encyc. and Illuſt. "Leaves lanceolate, oblong, mucronate, growing narrower towards the petiole." A ſhrub. *Leaves* ſmooth, ſhining, veined, only half as broad as in the preceding ſpecies, and reſembling thoſe of the almond tree; petioles longer. *Spines* oppoſite, ſtraight, ſimple, ſpreading horizontally. *Flowers* ſmaller. A native of the Eaſt Indies, communicated by Sonnerat, but perhaps only a variety. 3. C. *ſpinarum*, Linn. Mant. 559. Lam. Ill. pl. 118. f. 2. (Spina ſpinarum, Rumph. Amb. vii. p. 76. tab. 19. fig. 1.) "Leaves egg-ſhaped, acute, veined; ſegments of the corolla lanceolate-oblong." A ſhrub, five or ſix feet high, much branched, ſpreading. *Branches* ſlender, cylindrical, dichotomous, ſomewhat zig-zag. *Spines* in pairs, oppoſite, generally ſimple, ſometimes bifid, ſituated at the bifurcations and knots of the ſtem. *Leaves* ſcarcely an inch long, reſembling thoſe of the myrtle, oppoſite, egg-ſhaped, acute, entire, coriaceous, ſmooth, ſhining above, finely veined, on very ſhort petioles, ſo as to appear nearly ſeſſile. *Flowers* terminating, from two to five together on each petiole; tube of the corolla red, cylindrical, a little ſwelling about the middle; border white, ſpreading; ſegments five, lanceolate, acute. *Berry* blackiſh, about the ſize of a pea, egg-ſhaped, two-celled. *Seeds* two in each cell, elliptical, convex on one ſide, flat on the other. La Marck. A native of the Eaſt Indies. Loureiro found a plant in Cochinchina, which he ſuppoſed to be the ſame, and for which, in conjunction with another obſerved by him in Africa, he formed a new genus. But it differs ſo much, not only from the deſcription of Linnæus, but alſo from that of La Marck given above, which was taken from dried ſpecimens both in flower and fruit, that it muſt be a different plant. See Stigmarota. 4. C. *edulis*, Willd. 3. (Antura, Forſkal. Deſc. 63.) "Leaves egg-ſhaped, acute, without veins; branches villous near the top; ſegments of the corolla lanceolate-linear." A native of Arabia Felix. 5. C. *arduina*, Lam. Encyc. and Ill. (Arduina biſpinoſa, Linn. "Leaves heart-egg-ſhaped, mucronate, nearly without veins, evergreen; ſpines bifid at the tip. See Arduina. La Marck is the firſt who obſerved that the arduina and cariſſa of Linnæus are properly one genus, to which opinion Juſſieu has acceded.

** *Without thorns.*

6. C. *inermis*, Willd. 4. "Leaves egg-heart-ſhaped, mucronate, without veins," Vahl. Symb. iii. p. 43. *Leaves* three times as broad as thoſe of C. ſpinarum, rounded at the baſe. *Flowers* larger; ſegments of the calyx briſtle-ſhaped. A native of the Eaſt Indies. 7. C. *mitis*, Willd. 5. Vahl Symb. tab. 59. "Leaves lanceolate, attenuated." A native of the Eaſt Indies.

Carissa, in *Ancient Geography*, a town of Aſia Minor, in Paphlagonia. Pliny and Ptolemy.

Carissa *Regia*, ſurnamed *Aurelia*, a town of Spain, in the department of the Gades. The ruins are found in a place called Cariza.

CARISSIMI, in *Antiquity*, a quality or appellation given by the emperors of Conſtantinople to preſidents, governors of provinces, and others.

Carissimi, Giacomo, in *Biography*, a Roman muſical compoſer of the 17th century, whoſe productions were not only the delight of his contemporaries, but are ſtill ſought and hoarded by the curious as precious relics. He was, very early in life, appointed maeſtro di capella to the German college at Rome, in preference to all other candidates. Alberto delle Valle, an excellent judge of muſic, ſpeaking of the compoſitions of Cariſſimi, which he heard at Rome, without knowing his name, ſays, that he had heard the veſpers performed on Eaſter-Monday, by the nuns only, at the church *dello Spirito Santo*, in florid muſic, with ſuch perfection as he never in his life had heard before; and on the laſt Chriſtmas-eve, in attending the whole ſervice at the church of St. Apollinare, where every part of it was performed agreeably to ſo ſolemn an occaſion; though, by arriving too late, he was obliged to ſtand the whole time in a very great crowd, he remained there with the utmoſt pleaſure, to hear the excellent muſic that was performed. In the beginning, he was particularly enchanted by the *Venite exultemus*, which was more exquiſite than words can deſcribe. "I know not," ſays Valle, "who was the author "of it, but ſuppoſe it to have been the production of the "Maeſtro di Capella of that church." There was no maſter in Italy at this time, 1640, whoſe compoſitions this deſcription will ſo well ſuit, as thoſe of the admirable Cariſſimi, who was now, in all probability, the Maeſtro di Capella in queſtion; though ſo young, that his fame was as yet unfledged; however, it was in compoſing for this church that he acquired that great and extenſive reputation which he enjoyed during a long life, and which his offſpring, or muſical productions, ſtill deſervedly enjoy.

Kircher, in his Muſurgia, (tom. i. p. 603.) deſcribes his muſic and its effects in terms of high panegyric; and ſpeaks of him as a maſter then living, 1650, who had long filled the place of compoſer to the *Collegio Apollinare* with great reputation. He began to flouriſh about the year 1635, and, according to Mattheſon, was living in 1672. His productions are very numerous, though it does not appear that he ever compoſed for the theatre.

His ſacred and ſecular cantatas, and motets, have always had admiſſion into every collection of good muſic. It has been often aſſerted by muſical writers that he was the inventor of cantatas; but it has already been ſhewn, that theſe *ſcene da camera*, or monodies, had a more early origin. Cariſſimi, however, muſt be allowed not only the merit of transferring the invention from the chamber to the church, where he firſt introduced cantatas on ſacred ſubjects, but of greatly improving recitative in general, rendering it a more expreſſive, articulate, and intelligible language, by its approximation to ſpeech and declamation.

Many of Cariſſimi's works are preſerved in the Britiſh Muſeum, and in Dr. Aldrich's collection at Chriſt-church, Oxford.

There is ſomething intereſting in the moſt trivial compoſitions of this admirable maſter, and in his works may certainly be traced more traits of fine melody than in thoſe of any compoſer of the 17th century. Of twenty-two of his cantatas preſerved in the Chriſt-church collection, Oxon, there is not one which does not offer ſomething that is ſtill new, curious, and pleaſing; but moſt particularly in the recitatives, many of which ſeem the moſt expreſſive, affecting, and perfect, that we have ſeen. In the airs there are frequently ſweet and graceful paſſages, which more than a hundred years have not impaired. It is, however, in the *diviſions* of this, and of all old muſic, that the time when it was compoſed, and the changes of taſte, are chiefly diſcoverable. Theſe are the faſhionable forms and trimmings, which ſoon give way to others; but the principal ground-work, or materials, if good at one time, would not loſe their value at another.

Beſides Cariſſimi's numerous ſecular cantatas, duets, trios, and four-part ſongs, his compoſitions for the church, where he firſt introduced inſtrumental accompaniments, diſcover more genius, elegance, and deſign, than thoſe of any preceding or contemporary compoſer. Stradella's untimely death perhaps only prevented him from writing as much, and as well, as Cariſſimi.

Kircher, the contemporary of Cariſſimi, after a juſt eulogium on his compoſitions in general, and telling us that he had the power of exciting in his hearers whatever affection he pleaſed, ſpeaks of his oratorio of Jephtha, and the new and admirable effects produced in it by his knowledge of harmony, modulation, and happy expreſſion of the paſſions. The chorus in his ſacred drama, *Plorate filiæ Iſrael,* which follows the *lamento della figlia di Jepte,* is as remarkable for the accuracy of fugue and imitation, as for its plaintive expreſſion.

According to Mattheſon, the famous German compoſer, Kerl the younger was ſent by the emperor from Vienna to Rome, in 1649, to receive leſſons from Cariſſimi; who is ſaid to have acquired a conſiderable fortune by the exerciſe of his profeſſion, and to have lived to the age of 90.

He appears to have been the favourite compoſer and model of Dr. Aldrich, who was poſſeſſed of a complete collection of his works, which he ſcored with his own hand, and ſeems to have ſtudied with great attention. And Purcell manifeſtly formed his ſtyle on the productions of Cariſſimi and Stradella, particularly in his recitative and ſecular ſongs.

Cariſſimi was not only a man of ſuperior genius and abilities, but a bold contrapuntiſt: as we find, in one of his maſſes, ſeveral new harmonies which were thought unwarrantable more than a century after his deceaſe, in 1672. He is much, and juſtly, praiſed by Kircher, in his Muſurgia; his compoſitions were greatly admired by Dr. Aldrich, who adapted Engliſh words to ſeveral fine movements in his maſſes, which were long performed in the chapel of Chriſt-church college, Oxford.

In a maſs, in the key of C, we have a 7th *per ſaltum,* unprepared, and unreſolved on the 8th, the baſe deſcending a 3d.

The ſymphony to this maſs reſembles ſo much the overture ſtyle of Lulli and Handel, that primogeniture ſeems to entitle him, and not Lulli, to the invention. Lulli was born in 1633, and, in 1649, when Cariſſimi was celebrated by Kircher, and organiſt of the college Apollinare, Lulli was but 16.

Salvini ſays that this great contrapuntiſt, when he heard himſelf praiſed for his flowing, majeſtic, noble, and facile ſtyle of compoſition, uſed to exclaim: "Hah! how difficult it is to acquire this facility!" knowing ſo well the pains he had taken in acquiring it: and who, adds Signorelli on this paſſage, will deny that in the poetry of Metaſtaſio, there is that natural flow and facility of which Horace deſcribes:

Ut ſibi quivis
Speret idem, ſudit multum, fruſtraque laboret,
Auſus idem.

Beauty, in works of art, is acquired by great pains and labour, ſays an old Greek, Πάντα χὰλεπὰ τὰ καλὰ. The gods ſell to mortals whatever is excellent and beautiful, at the price of immenſe labour and ſweat of their brows. Epicharmes, the comic philoſopher.

CARISTI, in *Ancient Geography*, a people of Spain, placed by Ptolemy in the Tarragonnenſis, aſſigning to them the town of Sueſtaſium. M. d'Anville places them on the northern coaſt of Hiſpania Citerior.

CARISTIA. See Charistia.

CARISTO, Castel Rosso, in *Geography*, a town of European Turkey, in the iſland of Negropont; the ſee of a Greek biſhop, ſuffragan of Negropont. It is ſituated at the ſouthern extremity of the iſland; 54 miles S.E. of Negropont.

CARISTUM, in *Ancient Geography*, a town of Italy in Liguria, placed by Livy in the territory of the Statillionates. It was little ſouth of Dertona.

CARITAS. The *poculum caritatis*, or grace-cup, was an extraordinary allowance of wine, or other liquors, wherein the religious at feſtivals drank, in commemoration of their founder and benefactors.

CARITHNI, in *Ancient Geography*, a people of Germany, placed by Ptolemy between the Vangiones and the Viſpes.

CARITY, in *Geography*, a river of Scotland, which runs into the Eſk, in the county of Forfar.

CARIUM, or Curium, in *Ancient Geography*, a place in the iſland of Cyprus, where was the foreſt of Apollo.

CARIUS, or Corius, a river of Aſia, in Carmania, the mouth of which is placed by Ptolemy near the Perſian gulf.

CARIUS, in *Mythology*, an epithet of Jupiter among the Mileſians, probably appropriate to the worſhip of the Carians.

CARK, or Carke, in *Commerce*, a certain quantity, or meaſure, of wool equal to a thirtieth part of a sarplar.

CARL. See Churl.

Carl *Guſtavadſt*, or Eschilstuna, in *Geography*, a town of Sweden, in the province of Sudermania; 54 miles W. of Stockholm.

CARLAT, Le, a town of France, in the department of the Arriege, and diſtrict of Mirepoix; 22 miles N. of Taraſcon.

Carlat, a town of France, in the department of the Cantal; 5 miles S. E. of Aurillac.

CARLENTINI, a town of Sicily, about 2 miles from Lentini, containing 3000 inhabitants, built by Charles V. with a view of making it the head-quarters of his troops in Italy, and almoſt ruined by an earthquake. It was placed on an eminence to be out of the reach of the unwholeſome vapours of the marſhes. The houſes are ſo low, that the ſtreets ſtill reſemble a camp.

CARLEPONT, a town of France, in the department of the Oiſe, and diſtrict of Compiegne; 4 miles S. of Noyon.

CARLETON, George, in *Biography*, a learned biſhop in the 17th century, was born at Norham in Northumberland, in 1559, and was chiefly indebted for his education, firſt in grammar learning and afterwards at the Univerſity of Oxford, to the care and liberality of Bernard Gilpin. After having continued many years in the univerſity, where he diſtinguiſhed himſelf as a logician, orator, and poet, and more eſpecially as a divine, he was advanced, without any previous eccleſiaſtical preferment, to the biſhoprick of Landaff, to which he was elected in 1617, and conſecrated in 1618. In this year he was ſent by king James I. to the ſynod of Dort, and took an active part in the defence of epiſcopacy. Having given ſatisfaction by his conduct on this occaſion, he was immediately on his return, in 1619, promoted to the ſee of Chicheſter, where he remained till his death in 1628. He was a perſon of ſolid judgment and various reading, and extolled by Camden for his proficiency in divinity, and in other polite parts of learning. To the Papiſts he was a bitter enemy, and with regard to the doctrine of predeſtination a rigid Calviniſt: he wrote ſeveral books both in Latin and in Engliſh, of which the principal are his "Heroici Characteres," or Heroic Characters, Oxon. 1603. 4to.; "Tythes examined, and proved to be due to the clergy by a divine right," Lond. 1606 and 1611, 4to.: "Juriſdiction royal, epiſcopal, papal, wherein is declared how the Pope hath intruded upon the juriſdiction of temporal princes, and of the church, &c." Lond. 1610, 4to.; "Conſenſus Eccleſiæ Catholicæ contra Tridentinos, de Scripturis, eccleſia, fide, et gratia, &c." Lond. 1613. 8vo. "A thankful remembrance of God's mercy," &c. Lond. 1614, which paſſed through ſeveral editions; "Aſtrologimania" againſt judicial Aſtrology, Lond. 1624. 4to; "Vita Bernardi Gilpini, &c." Lond. 1626, 4to., publiſhed in Engliſh, Lond. 1629, 4to. and 1636, 8vo. &c. &c. He was alſo concerned in the Dutch Annotations, and in the new Tranſlation of the bible, undertaken by order of the ſynod of Dort, but not compleated and publiſhed till the year 1637. The ſon of the biſhop by his firſt wife, Mr. Henry Carleton, embraced the cauſe of the houſe of Commons in the civil war with king Charles I., accepted a commiſſion in the parliamentary army, and ſhewed himſelf to be an enemy to the biſhops. He was choſen repreſentative for Arundel in Suſſex, in the ſhort Parliament, which met at Weſtminſter in 1640. Biog. Brit.

**Carleton, Dudley,** viſcount Dorcheſter, an eminent ſtateſman in the 17th century, was the ſon of Anthony Carleton eſq. and born at his father's ſeat in Oxfordſhire in 1573. Having finiſhed his education, at Weſtminſter ſchool and at Chriſt-church College, Oxford, he travelled abroad for further improvement. After his return, he became ſecretary to Sir Thomas Parry, ambaſſador in France, and in 1603 he occupied the ſame office in the houſe of the earl of Northumberland. About this time he was alſo gentleman-uſher at court. In the firſt parliament of king James, he was repreſentative of the borough of St. Mawes in Cornwall, and diſtinguiſhed himſelf as an active member and an able ſpeaker. In 1605 he accompanied Lord Norris into Spain, and at the cloſe of this year he was ſummoned home under a ſuſpicion of being concerned with his former patron, the earl of Northumberland, in the gunpowder-plot; and though on his arrival he was confined, he was very honourably diſcharged. In 1610, he was appointed ambaſſador to the court of Bruſſels, but that embaſſy not taking place, he was ſent in the ſame capacity to Venice, and previouſly received the honour of knighthood. During this embaſſy, he eſtabliſhed the character of an able negociator, and was a principal agent in concluding a treaty between the king of Spain and the duchy of Savoy. He was alſo inſtructed to invite the republic of Venice to accede to the league between the king of Great Britain and the proteſtant Princes of the union in Germany: but his propoſal was not accepted. Soon after his arrival in England from Venice, in 1615, he was appointed ambaſſador to the States-General: and in this office he ſpent the moſt active period of his life, from 1616 to 1628. He was the laſt who poſſeſſed the privilege of a ſeat in the council of ſtate for the United Provinces, which queen Elizabeth had obtained for her ambaſſadors. Upon his arrival in Holland he was ſoon involved in the diſpute between the Arminians and Calviniſts, which then agitated that country; and the part he took in the politics which gave riſe to the ſynod of Dort, evinced his attachment to the Palatine cauſe and the public liberty of Germany. Many circumſtances occurred in the courſe of this embaſſy which rendered his ſituation peculiarly difficult and trying; but during the progreſs of them he conducted himſelf with great firmneſs and prudence, although the diſputes at home between Charles and his parliament, and their diſlike to his favourite miniſter, the duke of Buckingham, thwarted ſome of the principal plans in which he was engaged. In 1725, ſir Dudley Carleton returned to England, and was appointed vice-chamberlain of his majeſty's houſehold: and, at the ſame time, he was joined with the earl of Holland in a negotiation at the court of France, which terminated only in partial ſucceſs. Upon his return to England he found parliament much agitated by the miſmanagement of public affairs; and being choſen as a repreſentative for the borough of Haſtings, he endeavoured to allay the ferment that occurred during the proſecution of his patron, the duke of Buckingham. His conduct, however, on this occaſion, gave great offence to the friends and ſupporters of liberty in parliament; but it was very acceptable to an arbitrary court, and procured for him one of the rewards to which he aſpired, a ſeat in the houſe of peers, by the title of baron Carleton of Imber-court, in the county of Surry. Soon after, he was ſent as ambaſſador extraordinary to France, for the purpoſe of excuſing and juſtifying the diſmiſſal of the queen of England's French ſervants. In this unpleaſant negotiation he manifeſted his uſual prudence and addreſs. In 1627 it became neceſſary for him again to reſume his character of ambaſſador in Holland; but he found the States-General very differently diſpoſed towards this country than they were during his former embaſſy, nor was he admitted as he had before been into their councils, the ambaſſador from England having been deprived, by a particular reſolution, of his ſeat in the council of ſtate. He remained, however, in Holland, conducting a variety of intereſting negotiations, till he was recalled in 1628. Soon after his arrival he was created viſcount Dorcheſter, and ſecretary of ſtate. In this capacity he was a principal agent in compleating the treaties with France and Spain, and in conducting ſeveral foreign tranſactions, for which he was better qualified than for the internal concerns of the nation, which were now become very intricate and diſordered. He ſeems to have been inclined to arbitrary maxims of government, and to have acquieſced in the dangerous meaſures of Buckingham, Laud, and others, which widened the breach between the king and parliament. He did not live, however, to witneſs the diſaſtrous extremity in which they terminated; for having long ſtruggled with the diſorders occaſioned by frequent returns of the ſtone and gravel, he died in February 1631-32, in the 59th year of his age, and was interred in Weſtminſter abbey, where a handſome monument is erected to his memory. Carleton wrote a number of letters, ſpeeches, &c. on political topics; but the moſt valuable of his remains is a ſeries of diſpatches while abroad, from which a ſelection of "Letters to and from Sir Dudley Carleton during his Embaſſy in Holland, from January 1615-16 to December 1620," was publiſhed by lord Hardwicke, in one volume 4to. in 1757, with an hiſtorical preface: a ſecond edition appeared in 1775. Theſe letters, allowing for ſome party prejudices, contain a clear, curious, and intereſting account of Dutch affairs, during the period to which they refer, and ſundry valuable materials for modern hiſtory. Biog. Brit.

CARLIN, Carline, or Caroline, in *Commerce*, a ſmall ſilver coin, current in Naples and Sicily, equivalent to about four-pence Engliſh.

CARLINA, in *Botany* (quaſi Carolina, ſo called, ſays Caſpar Bauhin, from a tradition that the root was ſhewn by an angel to Charlemagne as a certain remedy for the plague, which prevailed in his army) Dodonæus, Lobel, Cluſius, Cæſalpinus, &c. Tournef. cl. 14. §. 5. gen. 2. Linn. gen. 929. Schreb. 258. Willd. 1437. Juſſ. 173. Vent. 2. 497. Gært. 940. Carline thiſtle. Claſs and order, *Syngeneſia polygamia æqualis*. Nat. Ord. *Compoſitæ capitatæ*; Linn. *Cinarocephalæ*, Juſſ.

Gen. Ch. *Calyx common* ſwelling, imbricated; ſcales numerous, looſe, acute; inner ones diſpoſed in a circle, very long, ſpreading, gloſſy, coloured, forming a kind of ray to the common flower. *Florets* monopetalous, funnel-ſhaped, equal, androgynous; tube ſlender; border five-cleft. *Stam.* Filaments five, capillary, very ſhort; anthers united into a hollow cylinder. *Piſt.* Germ ſhort; ſtyle filiform, the length of the ſtamens; ſtigma oblong, bifid or entire. *Peric.* none, except the permanent contracted calyx. *Seeds* ſolitary, roundiſh; down divided into ſomewhat chaffy, branched, and feathery rays. *Recep.* chaffy; chaff cleft at the tip into ſeveral ſegments.

Eſſ. Ch. Calyx radiated with long, coloured, marginal ſcales.

Sp. 1. C. *acaulis*, Lam. 1. Bauh. Pin. 380. Tourn. 500. (C. acanthifolia, Willd. 2. Mart. 8. Allion. ped. 571. tab. 51. C. chardouſſes, Vill. delph. 3. p. 30. Chamæleon albus, Cluſ. hiſt. 2. p. 155. Lob. ic. 2. p. 4.) "Flower very large, nearly ſeſſile; leaves broad, toothed, hoary." Lam. *Root* biennial, thick, oblong, fibrous. *Leaves* petioled, oblong, ſomewhat ſinuated, toothed, ſpinous at the edges, cottony and white on both ſides, ſpreading widely on the ground. *Flower* from four to ſix inches in diameter; outer ſcales of the calyx very ſpinous; inner ones white above, purpliſh underneath; receptacle thick and fleſhy. A native of dry hills in Italy, Spain, Germany, and the ſouth of France. 2. C. *cauleſcens*, Lam. 2. Bauh. Pin. 380. Tourn. 500. (C. elatior, Cluſ. hiſ. 2. p. 155. C. acaulis, Willd. 1.) "Stem one-flowered; flower rather large; leaves long, narrow, pinnate, green on both ſides; pinnæ gaſhed and toothed." Lam. *Root* perennial. *Stem* from ſix to ten inches high, reddiſh, ſlightly cottony, leafy, generally ſimple and one-flowered. *Leaves* very long, eſpecially the lower ones, divided to the midrib. *Flower* terminal, conſiderably ſmaller than that of the preceding ſpecies. A native of a ſandy ſoil in ſheltered ſituations on the Alps and other countries in Southern Europe. Linnæus conſidered theſe two plants as varieties of the ſame ſpecies, as did alſo Haller and Scopoli, but La Marck aſſerts that they are perfectly diſtinct. Both of them have a fleſhy receptacle which is eaten by the inhabitants of their native mountains, and is ſaid to equal that of the artichoke in flavour, while at the ſame time it exceeds it in ſize. It is, however, not likely to rival that eſculent on the tables of the luxurious, as it has been found not to flouriſh in cultivated ground. The roots of both ſpecies are aromatic, and are alſo uſed for food when young and tender, but in adult plants they acquire an acrimonious quality, and are then recommended as a diuretic, ſudorific, and alexipharmic medicine. The doſe of the root, when dry, is from one to two drams; when freſh, from two drams to half an ounce, but is more frequently given in a decoction than in ſubſtance. Allion. and Boſc. 3. C. *adgregata*. Willd. 3. Waldſt. and Kitaib. pl. rar. Hung. "Stems ſimple, one-flowered, numerous, aggregate; leaves pinnatifid, ſmooth; ſegments pinnatifid, divaricated, ſpinous." Willd. Root perennial. A native of rocky mountains in Croatia. 4. C. *lyrata*, Willd. 4. Thunb. prod. 141. "Leaves lyrate." A native of the Cape of Good Hope. 5. C. *lanata*, Linn. Spec. 2. Mart. 2. Lam. 2. Willd. 5. (C. flore purpuro-rubente, Tourn. 500. Acarna flore purpuro rubente, Bauh. pin. 379. Rai. hiſt. 289. A. atractylidis folio, Bar. ic. 483.) "Stem bifid, calyxes blood-red, terminal; the firſt axillary, ſeſſile." Linn. "Stem often bifid; the intermediate flower ſeſſile; leaves hoary, lanceolate, toothed, ſpinous." Willd. Whole plant whitiſh and a little cottony. *Root* annual, ſmall, fibrous, yellowiſh, odorous, and rather bitter. *Stem* ſeven or eight inches high, leafy. *Leaves* oblong, edged with yellowiſh ſpines; lower ones gaſhed and pinnatifid; upper ones ſlightly toothed. *Flowers* ſurrounded by ſpinous bractes reſembling the leaves, but ſhorter; outer leaflets of the calyx lanceolate, with only a terminal ſpine; radiating ones reddiſh purple, eſpecially underneath. A native of dry and rocky ground in Italy, Spain, and the South of France. 6. C. *involucrata*, Willd. 6. Deſf. atl. 2. p. 251. Poiret. itin. 2. p. 234. "Stem often bifid; intermediate flower ſeſſile; leaves pinnatifid, toothed, ſpinous, ſmooth." Willd. *Root* perennial. *Stem* a foot high, firm, erect. *Leaves* rigid. *Flowers* ſurrounded by a leafy involucre; ray of the calyx yellow; down ſeſſile, feathery; receptacle chaffy; chaff yellow, longer than the florets. On a dry ſoil the ſtem is often one-flowered. A native of Algiers. 7. C. *corymboſa*, Linn. 3. Mart. 3. Lam. 4. Willd. 7. (C. umbellata apula, Tourn. 500. Acarna, Col. Ecphr. 1. tab. 27. Acarna capitulis parvis luteis in umbella, Bauh. Pin. 379. Rai hiſt. 289.) "Stem many-flowered, ſometimes divided; flowers ſeſſile; ray of the calyx yellow." Linn. "Stem many-flowered, ſmoothiſh; leaves lanceolate, pinnatifid, toothed, ſmooth; flowers in a corymb." Willd. *Root* perennial. *Stem* a foot high or more, cylindrical, reddiſh, moderately cottony, generally ſimple. *Leaves* alternate, oblong, rather narrow, ſometimes a little cottony, pale green. *Flowers* terminal, from three to five, cluſtered. A native of dry ground in Italy and Provence. 8. C. *ſulphurea*, Willd. 8. Deſf. atl. p. 251. tab. 224. "Stem dichotomous, woolly; leaves lanceolate, toothed, ciliated with ſpines pubeſcent; flowers axillary, nearly ſeſſile." Willd. Root annual. Ray of the calyx ſulphur-coloured. A native of barren hills about Algiers. 9. C *hiſpanica*, Lam. 5. (Atractylis, Barrel. ic. 594.) "Stem often divided; branches one-flowered; flowers yellow, terminal." Lam. Whole plant ſmooth. *Stem* from ſix to ten inches high, leafy, ſtriated, or angular. *Leaves* alternate, a little pinnatifid, toothed, green, ſpinous. *Florets* bright yellow; ray of the calyx ruſſet-yellow. A native of Spain. 10. C. *vulgaris*, Linn. 4. Mart. 4. Lam. 7. Willd 9. Eng. Bot. 1144. Gært. tab. 163. fig. 1. Lam. Illuſ. pl. 662. "Stem many-flowered, corymboſe; flowers terminal; ray of the calyx white; Linn. Stem many-flowered, corymboſe, pubeſcent; leaves lanceolate, toothed, ſpinous, pubeſcent underneath." Willd. Whole plant rigid. *Root* biennial, ſpindle-ſhaped. *Stem* a foot high, leafy, furrowed, more or leſs leafy. *Leaves* alternate, ſinuated, very ſpinous, veiny, moſt, woolly underneath. *Flowers* erect; outer calyx-leaves very ſpinous; inner ones longer, linear, ſmooth, yellowiſh white, poliſhed, permanent; florets purpliſh; anthers with two briſtles at their baſe; ſcales of the receptacle much reſembling the inner ones of the calyx. The leaves and flowers do not decay immediately after the ſeeds are ripened, but often remain battered and bleached through the whole winter. Dr. Smith. *Receptacle* concave, chaffy; ſcales of the chaff towards the bottom membranous, keeled, entire, ſeveral neighbouring ones united together, ſo as to leave a hollow in the middle; towards the top cut into numerous briſtle-ſhaped ſegments, the length of the calyx. *Seeds* ſmall, oblong, narrower downwards, ſomewhat compreſſed, or obſoletely angular, inclining to aſh-coloured, crowned with a white chaffy ring, and clothed with white ſilky hairs which are produced beyond the tip; down twice as long as the ſeed, feathery; rays filiform, two or three often cohering a conſiderable part of their length, and appearing branched, all united at the baſe into a ring. Gært. In very rocky ſituations the whole plant is ſmaller, and bears only one flower. A native of dry heaths and paſtures in England, and throughout Europe, flowering in June and July. 11. C. *racemoſa*, Linn. 5. Mart. 5. Lam. 6. Willd. 10. (C. ſylveſtris minor hiſpanica, Cluſ. Hiſt. 2. p. 159. Tourn. 500. Acarna flore luteo patulo, Bauh. Pin. Atractylis hiſp. Bar. Ic. 593.) "Flowers ſeſſile, lateral, very few." Linn. "Stem ſometimes divided; flowers axillary, ſeſſile; leaves lanceolate, toothed, ſpinous, pubeſcent; floral leaves three-nerved." Willd. *Root* annual. *Stem* five or ſix inches high, ſlender, ſimple, leafy, ſomewhat cottony. *Leaves* rather narrow, whitiſh green. *Flowers* yellow. A native of a dry ſoil in Spain and Provence. 12. C. *pyrenaica*, Linn. Sp. Pl. 11. Mart. 6. Lam. 8. Willd. 11. (Carduus tomentoſus, pyrenaicus, ſpinoſiſſimus, flore albo, Burſ. 21. 43. Carduus carlinoides, Gouan. Illuſt. 62. tab. 23?) "Stem many-flowered; leaves decurrent." Linn. *Leaves* oblong, pinnatifid, cottony on both ſides, but moſt ſo underneath, armed with ſtrong, yellow ſpines. *Flowers* terminal, cluſtered; inner calyx-ſcales narrow, lanceolate, ſcarious, white, not forming an open radiating crown as in the other ſpecies of this genus, and rather indicating an affinity to the cardui; florets reddiſh, ſcarcely ſhorter than the calyx. A native of the Pyrenées, introduced into Kew garden in 1788 by Dr. John Sibthorp. 13. C. *atractyloides*, Linn. Sp. Pl. 7. Mart. 8. Lam. 9. (C. polycephalos, polyacanthæ vulgari ſimilis, æthiopica; Pluk. Al. 86. tab. 273, fig. 4. Good. Lam.) "Stem branched; calyx ſpines ciliated." Linn. *Stem* ſomewhat woody, full of pith, clothed near the top with a very ſhort greyiſh down. *Leaves* alternate, a little pinnatifid, toothed, very ſpinous. *Flowers* terminal, floſcular, yellowiſh; calyx ſcales narrow-lanceolate, ſpinous, large, radiating, but not ſcarious and coloured as the European ſpecies. A native of the Cape of Good Hope, communicated to La Marck by Sonnerat. 14. C. *gorterioides*, Lam. 10. "Whole plant cottony and very white; leaves oblong, deeply cut; teeth narrow, ſpinous; flowers ſmall, lateral, and terminal." Lam. *Leaves* alternate, oblong, rather narrow, pinnatifid; pinnules with narrow teeth, each terminated by a thorn. *Flowers* ſmall, yellowiſh; calyx ſpinous; inner ſcales not ſcarious; florets deeply divided. La Marck obſerves that this ſpecies muſt belong to the ſame genus as the preceding, but that they do not well accord with the true Carline thiſtles. A native of the Cape of Good Hope, communicated by Sonnerat. 15. C. *xeranthemoides*, Linn. jun. Sup. p. 349. Mart. 7. Lam. 11. Willd. 12. "Stem ſhrubby, branched, tomentous; leaves linear awl-ſhaped; ferratures ſpineſcent; panicles terminal; ray yellow." A handſome ſhrub. *Stem* cylindrical; branches nearly ſimple, but divided at the top into leafy peduncles. *Leaves* ſcattered, not decurrent, green and ſmooth above, white with wool underneath. *Flowers* in terminal panicles, ſurrounded by a few bracteal leaves, reſembling thoſe on the ſtem, but without ſpines, and cottony, and not longer than the calyx; inner ſcales of the calyx rather long, recurved, awl-ſhaped, ſpiny; ray bright yellow; ſcales a little ſerrated; florets the ſize of the ray. Obſerved by Maſſon in Barrancas, about Chaſna.

The foreign ſpecies may be propagated by ſowing the ſeeds in the ſpring, on a bed of freſh, undunged earth; they ſhould be afterwards thinned, but not tranſplanted. Moſt of them will flower the ſecond year, but they ſeldom ripen their ſeeds in England, and are not eaſily preſerved.

Carlina *foliis latis ad oras ſpinis dentatis:* Burm. Afr. 154. tab. 55. See Arnica *crocea*.

Carlina *acaulos gummifera*, Bauh. pin. 380. See Atractylis *gummifera*.

Carlina *minima caulodes*, Barr. rar. 1127. tab. 592. See Atractylis *humilis*.

Carlina? *africana*, &c. Pluk. alm. 86. tab. 273. See Atractylis *oppoſitifolia*.

Carlina *acaulis minore purpureo flore*, Bauh. pin. 380. Rai. hiſt. 310. C. minor, Cluſ. hiſt. 2. p. 156. C. montana; Barrel. ic. 493. See Carduus *acaulis*.

Carlina *foliis imbricatis*, &c. Burm. Afr. 151. tab. 54. fig. 1. See Gorteria *ciliaris*.

CARLINGS, in *Ship-building*, ſquare pieces of timber ranging fore and aft between the deck-beams, into which they are ſcored; and ſerving to ſtrengthen the ſhip, and ſuſtain the ſmaller beams.

Carling *knees*, thoſe timbers between the ſides of a ſhip and the hatchway ſerving to ſupport the deck on both ſides.

CARLINGFORD, in *Geography*, a market and poſt town of the county of Louth, Ireland, on the ſouth-weſtern ſide of the bay called from it. This town was formerly diſtinguiſhed both as a place of ſtrength, and as a ſea-port. The caſtle, founded on a ſolid rock waſhed by the ſea, is ſaid to have been built by king John; but Cox, with more probability, attributes it to one of the Bourkes or Bourghos, who were earls of Ulſter. The town was afterwards walled, and is often mentioned in the hiſtorical memoirs of Ireland. It was alſo a place of good inland trade, and ſome commerce; but it has conſiderably declined, and is now remarkable only for its fine-flavoured oyſters. Carlingford is a corporate town governed by a mayor and burgeſſes, and before the union was repreſented in paliament, but was not of ſufficient importance to retain this privilege. It is 11 miles N.E. of Dundalk and 51 N. of Dublin. N. lat. 54° 1′. W. long. 6° 9′.

Carlingford *Bay*, or *Lough*, a large, well ſheltered harbour on the eaſt coaſt of Ireland, which has good ground, and water ſufficient for the largeſt veſſels; but there are ſeveral rocks and ſhoals, that muſt be carefully attended to when great ſhips are brought into this harbour. There is a bar on the eaſt ſide of Blockhouſe iſland, extending about half a mile, on which the leaſt water is eight feet. The weſt ſide, between Blockhouſe iſland and Balaghan point, is altogether rocks and ſhoals, not to be attempted. Carlingford is on the weſt ſide of the bay, which is ſhallow, and dries before low water, but ſmall veſſels may lie ſafe near the town, on ſoft mud. Newry, which has a ſmall river and canal that joins the bay, derives the chief benefit of this harbour. N. lat. 54° W. long. of the north-eaſtern point 6° 1′. M'Kenzie.

CARLISLE, a city of Cumberland, England, is noted in the hiſtoric annals of Great Britain as being the ſcene of repeated ſieges and warlike operations between the Engliſh and Scottiſh nations. It was alſo a place of ſome conſequence during the Anglo-Roman dynaſties. "Its Roman colonization," ſays Camden, "appears plainly from the various evidences of antiquity occaſionally dug up, and from the frequent mention of it in the writers of thoſe days: and even after the ravages of the Picts and Scots, it retained ſomething of its ancient ſplendour, and was accounted a city." Soon after the Romans had quitted the iſland, Carliſle was entirely abandoned to the northern invaders, and by them completely ruined and laid waſte. In this ſtate of deſolation it remained till the reign of Egfrid, king of Northumberland, who ordered it to be rebuilt, and encompaſſed it with a wall. He afterwards beſtowed it on the celebrated St. Cuthbert, who viſited his new acquiſition in the year 686, and, according to Bede, "was carried by the towns-people to ſee their walls, and a fountain, or well, of admirable workmanſhip, conſtructed therein by the Romans." St. Cuthbert was biſhop of Lindisfarn; and by Egfrid's grant, Carliſle became an appendage to that ſee, and ſo continued till the year 1133, when Henry I. conſtituted it a ſeparate biſhopric. During the incurſions of the Danes, in the eighth and ninth centuries, Cumberland was expoſed to frequent ravages, and this city underwent its full ſhare of calamity, for it was wholly conſumed by fire; its inhabitants were maſſacred, and its walls overthrown. "Its very foundations," ſays Dr. Todd, "were buried in the earth, ſo that, it is ſaid, large oaks grew upon them; and this is not only atteſted by our hiſtorians, but alſo evinced by ſome diſcoveries that have lately been made of large unhewn oak trees buried ten or twelve feet below ground." In this deſolate ſtate the city remained nearly 200 years, when Walter, a prieſt, and follower of William the conqueror, repaired a few of the ruined habitations, and attempted to re-eſtabliſh a religious inſtitution, that had either been founded by St. Cuthbert, or about his time: on this occaſion the conqueror iſſued a mandate, that the inhabitants of Cumberland, but particularly of Carliſle, ſhould be ſubject to the epiſcopal juriſdiction of Durham; from "the predeceſſors of whoſe dioceſan they had received chriſtianity." When William Rufus returned from his intended attack on Malcolm, king of Scotland, about the year 1094, he made a viſit to this city, and perceiving its importance as a frontier ſtation, gave orders that it ſhould be completely reſtored, and entruſted the execution of his plan to the above Walter, under whoſe direction ſeveral public edifices were built, a ſtrong fortreſs erected, and the whole defended by a wall of circumvallation. Theſe buildings are ſuppoſed to have been raiſed by Flemiſh artificers, a colony of whom was ſettled here by Rufus, but ſoon afterwards removed to North Wales, and the iſle of Angleſey, and its place occupied by a body of South Britons, who were directed to cultivate the neighbouring lands, and to teach the natives the art of rendering the fertility of the ſoil conducive to their ſubſiſtence. From this era, Carliſle may be regarded both as a military ſtation, and a city; and for ſeveral centuries its vicinity to Scotland occaſioned it to experience many viciſſitudes. Having been ceded by Stephen to the Scottiſh king, David, about the year 1136, it was made a place of retreat by the latter, after his defeat in the dreadful battle of the Standard, in 1138; and here alſo he received the pope's legate, Alberic, by whoſe influence all the female captives that were brought into Carliſle, were ſet at liberty. "He alſo obtained from the Scottiſh leaders a ſolemn promiſe, that in future incurſions, they would ſpare the church, and withhold their ſwords from the aged, from women, and infants; an injunction which humanity dictated, but which the ſavage cuſtoms of the contending nations had not before admitted into the modes of warfare." Carliſle, from this period to the time of Edward I., was ſubjected to ſeveral diſaſtrous events. The 35th year of that monarch, 1307, will be ever memorable in the annals of this city, from the parliament that met here January 20, and continued ſitting till the Palm Sunday following, during which period ſeveral important acts were paſſed, and laws made to promote the expedition which the king was then meditating againſt the Scots. Edward remained at Carliſle till June 28, when he proceeded towards Scotland, but, being ſeized with a flux, expired at Burgh-on-Sands, on the ſeventh of the following month. In 1338, Carliſle was beſieged by the Scots, and the ſuburbs burnt; as was frequently the caſe during the contentions between the rival houſes of York and Lancaſter. The wealth of the city was ſo much reduced by theſe repeated outrages, that Edward IV. remitted to the inhabitants one half of the ancient annual rent of 80 pounds paid to the crown, and alſo granted them the lordſhip of the royal fiſheries at Carliſle. The war between Charles I. and his parliament once more involved this city in the horrors of a ſiege, and the general diſtreſs was increaſed by the calamity of famine. The blockade commenced October 9, 1644, and continued till the enſuing June, when the place ſurrendered to general Leſley, who commanded for the parliament. During the intermediate time, the wants of the inhabitants and garriſon were ſo great, that not only horſes, but even dogs and rats were eaten; and hemp-ſeed was ſubſtituted for bread till that alſo was conſumed; the city was then given up on honourable terms. The laſt occurrences of this nature, of which Carliſle was the ſcene, were thoſe which accompanied the rebellion in 1745, when it ſurrendered, after a ſhort ſiege, to the forces of the pretender. The ſituation of Carliſle is extremely ſine; it ſtands on a gentle riſing ground, in the midſt of extenſive and fertile meadows, terminated by the diſtant mountains, and watered by the Eden, the Caldew, and the Peteril. The two former of theſe rivers flow on different ſides of the city; and their banks and contiguous meadows afford a number of pleaſant walks to the inhabitants. In high floods in the winter ſeaſon the low lands are ſometimes inundated, and the city at thoſe periods appears like a promontory, or iſland riſing from the midſt of a vaſt lake. The improvements that have been effected at Carliſle, ſince the union with Scotland, are exceedingly numerous. It was then more celebrated for the ſtrength of its walls, and fortreſs, than either for the neatneſs of its buildings, or the reſpectability of its inhabitants; but as the proſpect of future commotions vaniſhed, manufactures were introduced, and a taſte for improvement accompanied the increaſe of wealth. This being attended with an augmented population, alterations and improvements were rapidly made. At the commencement of the laſt century, the dwellings of the inhabitants were moſtly formed of wood, clay, and laths, exhibiting ſingular ſpecimens of poverty and vitiated taſte. The gable ends fronted the ſtreets; and the diminutive windows, projecting porches, and clumſy oaken doors, faſtened together with large wooden pins, correſponded in form with the gables. The ſtreets were badly paved; and the gutters, or rather trenches, on each ſide, were ſo wide and deep, that ſmall bridges were in many parts placed over them for the convenience of paſſengers. Theſe obſtructions have been in a great meaſure removed, many of the houſes have been rebuilt with propriety and even elegance, and many new ones erected in the modern ſtyle. Some very material improvements are now making in the entrance to the city. The ſpace included within the walls is ſomewhat in the form of an irregular triangle; the buildings, however, extend conſiderably beyond theſe limits, but are chiefly ſpread in the vicinity of the city gates which are three in number, and reſpectively denominated from their contiguity to the Engliſh, Iriſh, and Scottiſh kingdoms. The Engliſh gate is connected with the building called the citadel, which is of an oblong ſhape, having a round tower at each end, with ſlender openings for the diſcharge of arrows. Theſe openings are ſingularly conſtructed, the apertures diverging outward, but gradually decreaſing to the inner ſide, where they become narroweſt. The towers are low, but apparently of great ſtrength; and, together with the gateway, were built by Henry VIII. The city walls are principally formed of ſquared ſtone, and on the ſouth and eaſt ſides ſupported by numerous buttreſſes. Various flights of ſteps lead to the top, whence the proſpects are in many parts extenſive and intereſting. The public buildings are various; yet thoſe which chiefly engage the curioſity of the viſitant, are the caſtle, and the cathedral. Theſe edifices, or at leaſt certain parts of them, are of conſiderable antiquity, but have undergone many viciſſitudes, and experienced various alterations.

The *caſtle* ſtands at the north-weſt angle of the city, and conſiſts of an outward and inward ward. Within the latter is the great tower, dungeon, or citadel of the caſtle. This is of a ſquare form, and very lofty, with walls of vaſt thickneſs, and conſtructed according to the modes of defence employed before the invention of cannon. It has ſince been ſtrengthened according to the modern ſyſtem, and defended by a half-moon battery and a very large platform, mounted with cannon under cover of the outward wall. The outer ward contains the governor's houſe; and in one of the gates of the caſtle the old portcullis is ſtill remaining. This fortreſs was made the priſon of the unfortunate queen Mary, for ſome time after her landing at Workington, and the apartments wherein ſhe was lodged are ſtill ſhewn.

The *cathedral* was erected at various periods, and diſplays ſpecimens of different ſtyles of architecture. Some part of it is apparently as old as the Saxon times, but the greateſt portion is more modern. Several parts of the building are extremely beautiful; but on the whole it appears to much diſadvantage, having "been curtailed of its fair proportion" in the civil wars, at which period about 30 yards of the nave was pulled down to erect guard-houſes and batteries. The opening was afterwards cloſed with a wall, and the ſpace within the wall, and the tranſept fitted up as the parochial church of St. Mary, as the entire weſt end had formerly been; and divine ſervice is regularly performed in it. The arches in this part of the cathedral, and in the tranſept, are circular, and the ſhafts extremely maſſive; the height of each being only 14 feet two inches, while the circumference is 17 feet and a half. The choir was begun by biſhop Welton in the reign of Edward III., and finiſhed by the ſucceeding biſhops, Appleby, and Strickland. The expences were chiefly defrayed by ſubſcription; and indulgences and remiſſions of penance were alſo granted to ſuch of the laity as ſhould by money, materials, or labour, contribute to the pious work; copies of various orders and letters patent iſſued for the occaſion are preſerved in the biſhop's regiſter. Several ancient monuments are remaining in the cathedral, ſuppoſed to be for the biſhops Welton, Appleby, and two or three others, but uncertain for whom; and on the north ſide of the choir, near the altar, is a curious monumental braſs plate, erected to the memory of biſhop Henry Robinſon, who was born in this city about the year 1556, and became celebrated for his piety and learning. The whole ſtructure, and indeed moſt of the buildings in this city, are compoſed of a coarſe, but durable, kind of red free-ſtone. Biſhop Tanner remarks, that "this is the only epiſcopal chapter in England of the order of St. Auſtin." Before the diſſolution of the monaſteries, ſeveral religious houſes were eſtabliſhed in this city; and ſome few remains are yet viſible. The cathedral itſelf ſeems to have belonged to a priory. The chapter-houſe and cloiſters ſtood on the ſouth ſide of the catheral, but were pulled down during the civil wars. The only church in Carliſle, beſides that of St. Mary's in the cathedral, is St. Cuthbert's; this is a plain modern building erected in 1778, on the ſite of the ancient ſtructure, which appears to have been originally built before the deſtruction of the city by the Danes. The other edifices for religious worſhip are three meeting-houſes for Proteſtant diſſenters, one for Quakers, one for Methodiſts, and a Catholic chapel. The three principal ſtreets range nearly in the ſhape of the Roman Y, and meet at the *market place*, where the town-hall, moot-hall, and council-chamber are ſituated. Here the aſſize courts and quarter ſeſſions are held, and moſt of the public buſineſs is tranſacted. The corporation records are alſo kept here; and the repreſentatives for the city elected. In this diſtant part of the kingdom, priſoners are frequently obliged to remain without trial ſeveral months, as the aſſizes are only held once a year. Near the gaol are ſome buildings called charity houſes, where decayed freemen, and widows of freemen, are permitted by the corporation to live rent-free. The poor are maintained in a workhouſe erected by ſubſcription about the year 1760; prior to that time, they were either farmed out, or had a weekly allowance at their own houſes. A diſpenſary was inſtituted July 1, 1782, for the relief of the indigent ſick, and upwards of 15,000 perſons are computed to have been relieved ſince its eſtabliſhment. Carliſle has received many royal grants, and been inveſted with great privileges by different monarchs, but nearly all the original charters have been conſumed by the fires that have ſo frequently deſolated the city. Charters of confirmation have been granted by Edward III., Henry VII. and VIII., and every ſucceeding ſovereign, to the reign of Charles I., who ordered ſome alteration to be made in the mode of electing the different officers. The city was firſt repreſented in parliament 23 Edward I.: the members are choſen by the free burgeſſes, who are about 700 in number. The population and buildings of Carliſle and its ſuburbs, have increaſed in a very rapid manner during the preceding century; but the augmentation has principally been made within the laſt 40 years. By the return made under the late population act, the number of houſes was found to be 1338, of inhabitants 10,221. In the year 1761 various new works were eſtabliſhed; a company from Newcaſtle began the calico printing buſineſs which has progreſſively increaſed ever ſince, and now furniſhes employment to many hundreds of men, women, and children. There are four print fields, which employ a thouſand perſons, and pay upwards of 20,000l. to the revenue annually. Beſides theſe, there are eight other manufactories; and ſome of them execute every branch, from preparing the raw materials, to the completion of checks, callicoes, muſlins, and all kinds of fancy-work. A brewery has been eſtabliſhed, and three others have been lately erected; a ſoap manufactory has alſo been built; and ſo greatly has the trade of the city increaſed, that the duty paid on licences and exciſeable articles amounts to more than 110,000l. yearly. Its growing importance is evinced by the eſtabliſhment of two banks, both of which have been opened within a few years. Carliſle is 303 miles N.W. from London; and has two weekly markets, Wedneſday and Saturday. Hutchinſon's hiſtory of Cumberland, 2 vols. 4to.

**Carlisle**, the chief town of Cumberland county, in the ſtate of Pennſylvania, North America, pleaſantly and ſalubriouſly ſituated in the poſt-road from Philadelphia to Pittſburg, 125 miles W. by N. from the former, and 178 E. from the latter. The town contains about 400 houſes, chiefly of ſtone and brick, and about 1500 inhabitants. The ſtreets interſect one another at right angles; and the public buildings are a college, court-houſe, and gaol, and four edifices for the public worſhip of the Preſbyterians, Germans, Epiſcopalians, and Roman Catholics. Dickinſon college has a principal, three profeſſors, a philoſophical apparatus, and a library conſiſting of about 3000 volumes. Its revenue ariſes from 4000l. in funded certificates, and 10,000 acres of land. N. lat. 40° 12′. W. long. 77° 12′.

Carlisle *Bay*, a bay on the weſt ſide of the iſland of Barbadoes, in which ſtands *Bridge-town*, which ſee.—Alſo, a bay of the iſland of Antigua; three miles W. of Falmouth. —Alſo, a bay on the ſouth coaſt of the iſland of Jamaica. N. lat. 17° 47′. W. long. 77° 6′.

CARLISLES *Lagoon*, a bay, on the north coaſt of the iſland of Egmont, or New Guernſey, in the Southern Pacific Ocean, between How's Point and Portland's Iſland. S. lat. 10° 42′. E. long. 164° 16′.

CARLOCK, Carlick, or Charlock, a provincial term ſometimes made uſe of to ſignify the weed charlock. See Charlock.

Carlock, in *Commerce*, a ſort of fiſh-glue, or iſinglaſs, imported from Archangel. It is made with the ſturgeon's bladder; and is uſed for clarifying wine, as alſo in dying. The beſt comes from Aſtracan, a city in Muſcovy, at the mouth of the river Wolga, where they catch great quantities of ſturgeon.

CARLOMAN, in *Biography*, eldeſt ſon of Charles Martel, ſucceeded his father in 741 to the dominion of Auſtraſia. After many warlike expeditions, which were attended with ſucceſs, and in which he diſplayed equal courage and ability, he conceived a diſguſt with the world, and determined on religious retirement. Accordingly, he made a journey to Rome with a ſplendid retinue, and having in his own name, and in that of his brother Pepin, preſented magnificent gifts to the holy ſee, he received the clerical tonſure from the hands of pope Zachary in 747. He afterwards retired to a monaſtery on mount Soracte, where he became a monk of the order of St. Benedict; and withdrawing for greater privacy to the abbey of mount Caſſin, he ſpent his remaining days in the offices of the convent, and the exerciſes of devotion. He died at Vienne in Dauphiny in 755.

Carloman was alſo the ſon of Pepin the Short, and younger brother of Charlemagne, and was conſecrated at Soiſſons, in 768, to the ſovereignty of Auſtraſia, Burgundy, and part of Aquitaine. Being on ill terms with his brother, a ſerious conteſt between them was expected to have taken place; but it was prevented by the death of Carloman in 771, which left his brother ſole poſſeſſor of the French monarchy.

Carloman was alſo the ſon of Lewis II., called the Stammerer, and, in conjunction with his brother Lewis III., ſucceeded his father in 879. France was at this time diſtracted by inteſtine competitions for power; and whilſt Carloman, aſſiſted by his brother, was beſieging Vienne, in a conteſt with Boſon, who had eſtabliſhed the kingdom of Arles, or Provence, Lewis was called upon to reſiſt the Normans, who made inroads on the northern ſide, and died in 882. Carloman, in conſequence of this event, was declared king of France, and abandoning the ſiege of Vienne, marched into Picardy, where with a ſum of money he purchaſed the retreat of the Normans. He was ſoon afterwards wounded in hunting the wild boar, and died in 884, at the early age of 18, before the conſummation of a marriage, which he had contracted with a daughter of Boſon.

Carloman was alſo king of Bavaria, and in 876 ſucceeded his father Lewis I. king of Germany in the ſovereignty of Bavaria, compriſing, beſides that province, Bohemia, Moravia, Carinthia, Auſtria, Sclavonia, and part of Hungary. With the deſign of annexing Italy to his dominions, he marched his army into the country, but after a partial ſucceſs in Lombardy, he was induced by a falſe alarm to abandon the accompliſhment of his purpoſe, though he retained the title of king of Italy. He died of a palſy in 880. Mod. Un. Hiſt. vol. xix.

CARLONI, Giov. Batista, an eminent painter of hiſtory, was a native of Genoa, and having proſecuted the ſtudy of his art at Rome and in the ſchool of Paſſignano at Florence, he became one of the moſt fertile, original, and ſeducing machiniſts of Italy. The moſt ſplendid works of this artiſt, and of his brother Giovanni, are the freſcoes of the cathedral del Guaſtato at Genoa, which exhibit a wonderful effect of colouring. He ſurvived his brother 50 years, and diſtinguiſhed himſelf by this novel ſtyle in the churches and collections of Liguria and Lombardy. His powers were very various; and he is ſaid to have poſſeſſed equal felicity in oil and freſco, colour and deſign, velocity and correctneſs. He had inceſſant employment, and was unrivalled in diligence and perſeverance. After a prolonged life of 86 years, he died in 1680. Pilkington by Fuſeli.

CARLOS, in *Geography*, a fort on the north coaſt of Terra Firma, ſeated on an iſland which commands the channel between the gulf of Venezuela and that of Maracaybo on the ſouth, little more than 20 miles N. from the town of Maracaybo.

Carlos, a town of Veragua, in New Spain, 45 miles S.W. from Santa Fé, ſituated in a large bay, having a number of ſmall and deſert iſlands at its mouth. N. lat. 7° 40′. W. long. 82° 10′.

Carlos St., a town of North America, in the province of Nicaragua, ſeated on a river which runs from the lake of Nicaragua into the Caribbean Sea. N. lat. 11° 46′. W. long. 66° 40′.—Alſo, a town of the iſland of Cuba; 62 miles E. of Havannah.

CARLOSA, a town in the interior part of Braſil, on the ſouth-eaſt ſide of St. Francis river, and north by weſt from Villa Nova. S. lat. 15°.

CARLOSTADIANS. See Carolostadians.

CARLOTTA, La, in *Geography*, a town of Spain, in the province of Andaluſia, built in 1769 for German and Italian emigrants; 15 miles S. of Cordova.

CARLOVINGIANS, in *Hiſtory*, the title by which the French kings of the ſecond race have been diſtinguiſhed, and which was firſt derived from Charles Martel, (ſee his article,) and commenced with his ſon Pepin in 752, and terminated with Louis V. in 987. They reckon 14 kings of this family. The mutual obligations, ſays Gibbon, (Hiſt. vol. ix. p. 150. &c.) of the popes and the Carlovingian family, form the important link of ancient and modern, of civil and eccleſiaſtical hiſtory. On the part of the popes, the moſt eſſential gifts which they conferred on the Carlovingian race were the dignities of the kings of France, and of patrician of Rome. See Pepin and Charlemagne. On the other hand, the gratitude of the Carlovingians was adequate to their obligations, and their names have been conſecrated as the ſaviours and benefactors of the Roman church. Her ancient patrimony of farms and houſes was transformed by their bounty into the temporal dominion of cities and provinces; and the donation of the *Exarchate*, (which ſee,) was the firſt fruits of the conqueſts of Pepin.

CARLOW, or Catherlogh, in *Geography*, a county in the province of Leinſter, Ireland, which lies between Kildare on the north, Queen's county on the north-weſt, Wicklow on the north-eaſt, Wexford on the ſouth-eaſt, and Kilkenny on the ſouth-weſt and weſt. It is 26 Iriſh miles (33 Eng.) in length from north to ſouth, and 23 (29 Eng.)

at its greateſt breadth, but it narrows to the ſouth in the form of a wedge. It contains 137,050 Iriſh acres, or 214 ſquare miles, (220,098 acres, or 344 ſquare miles Engliſh meaſure,) and 8763 houſes, which, at five to each houſe, would give a population of about 44,000, which is certainly a moderate computation. The number of pariſhes is 50, none of which are wholly impropriate; but in conſequence of unions they form only 17 benefices, all in the dioceſe Leighlin. Some idea may be formed of the religious ſtate of the county from four of theſe benefices being without a church, and only one of them having a glebe houſe. The number of members which repreſent it in the imperial parliament are three, two for the county, and one for the town of Carlow. The river Barrow, which is navigable, runs through this county from north to ſouth, and for many miles forms its weſtern boundary. The woody hills which ſkirt the northern part preſent a beautiful and varied ſcenery. The river Slaney alſo croſſes it in its paſſage from Wicklow to Wexford. That part of Carlow which lies on the weſt of the Barrow is covered with rough and high hills. Another mountainous tract continues all along the bounds of Wexford, beginning at the north with the high and rocky mount Leinſter, and terminating in that which is called Blackſtairs. But the champaign country is very rich and fertile. When Mr. Young was in this county in 1776, he obſerved cultivation riſing up the ſides of the mountains; he found alſo that the hiring tenant was in general the occupier, and that the average rent of the county was 15s. per acre, which was about the average rent of the whole iſland. Rents, however, have probably riſen conſiderably in conſequence of the improved ſtate of the county with reſpect to inland navigation. The mineralogy of the county is very imperfectly known, but from the account of Mr. D. Stewart, publiſhed in the Tranſactions of the Dublin Society, by which he was employed, there appears to be abundance of marl, lime-ſtone, gravel, great variety of clays, ſome of them light and ſoapy, ſome iron ore, and a great deal of oxyd of manganeſe.

Carlow was made a county by king John during his viſit to Ireland in 1210, having been before called *Hydrone*, and *Hy-Cavanagh*. It was part of the territory, of which Strongbow acquired the ſovereignty by his marriage with Eva daughter of the king of Leinſter, confirmed to him by king Henry as ſupreme lord of Ireland; and it was afterwards held by his deſcendants, the earls Mareſchel. The principal towns are Carlow, Leighlin-bridge, and Tullow.

The above article is chiefly taken from Dr. Beaufort's excellent memoir accompanying his map of Ireland; but Mr. Young's tour, and other works, have been conſulted. No ſtatiſtical account of Carlow has been yet publiſhed.

Carlow, a borough and poſt town, and the aſſize town of the county of the ſame name, ſituated on the river Barrow. It was formerly called Catherlogh, or Catherloch, i. e. *the fortreſs in the lake*, and gave name both to the county and barony in which it is placed. It was early fortified, ſome ſay by king John, others by John Conſtable of Cheſter, and Hugh de Lacy, whilſt the building of the caſtle is attributed to Eva, the wife, or Iſabel, the daughter of Strongbow. It was certainly deemed of ſome conſequence as a fortreſs, and therefore had its full ſhare of the calamities which have for ſo many centuries devaſtated Ireland. It does not appear, however, to have been large. Boate ſpeaks of it with contempt, but it has ſince increaſed, and was, at the union, deemed worthy of ſending a burgeſs to the imperial parliament. It has a manufacture of a coarſe kind of woollen cloth, but it is not conſiderable. The junction, however, of the grand canal with the Barrow, and the improved navigation of this river, will probably occaſion the further increaſe of the town. The appearance it makes is cheerful, from the number of white houſes ſcattered up and down in the neighbourhood. It is regularly built, has ſome good public edifices, and has a neatneſs ſuperior to moſt towns in Ireland. The caſtle is a fine ruin overhanging the Barrow. The Roman Catholics have a large ſeminary here. Carlow is 39 Iriſh miles S.W. of Dublin, on the great ſouthern road, in N. lat. 52° 50'. W. long. 6° 58'. Dr. Beaufort's Book of Roads, &c.

CARLOWITZ, a military town of Sclavonia, in which the Greek biſhop of Sclavonia reſides; famous for the peace concluded there with the Turks in 1699, and alſo for its red wine.

CARLSBAD, a town of Bohemia, in the circle of Saatz, on the river Eger, celebrated for its baths of hot water, diſcovered in 1370 by the emperor Charles IV. as he was hunting; 56 miles W. of Prague.

Carlsbad, or Caroline *Waters*. Theſe very ſingular and celebrated hot mineral waters have engaged (as they deſerved) the attention of many naturaliſts and chemiſts. They are ſituated at the town of Carlſbad in Bohemia, on the banks of the river Toepel, or Teply, which joins the Eger, a tributary to the Elbe, and were firſt brought into high repute by the emperor Charles IV. about the year 1370.

There are ſeveral ſprings of this water within a ſmall compaſs, of which the principal one, called the *Prudel*, (or *Furious*,) iſſues out with great vehemence in a large body through a natural vault or incruſtation of ſtalactite, which it has formed by long depoſition.

The temperature of this fountain is invariably 165° Fahr. at all ſeaſons, and hence it always ſends forth a conſiderable body of ſteam. Some of the other ſprings are only 120° to 125°. The taſte of this water is ſtrongly alkaline, ſaline, rather bitter, and ſtrongly chalybeate. It has ſcarcely any ſmell, and contains nothing ſulphureous.

This water is remarkable for a very rapid depoſition of carbonat of lime as it cools, which forms a very hard and beautiful ſtalactite, or petrifaction, that incruſts any wood, moſs, &c. which happens to remain in it for a day, and ſoon choaks up any pipe through which it is conducted. Along with the carbonat of lime, the iron which it holds is alſo precipitated, forming with the former a beautifully variegated ſtalactite, which takes a high poliſh.

This water has been analyſed by ſeveral eminent chemiſts, and particularly by Bergman, and by Dr. Becher in his elaborate treatiſe on this ſpring, and more lately by Klaproth. The latter only we ſhall give, which however agrees very nearly with the others.

Carlſbad water contains carbonat of ſoda, ſulphat of ſoda, muriat of ſoda, and, when ſtill hot, carbonat of lime held in ſolution by carbonic acid, ſilex, carbonat of iron, and a portion of uncombined carbonic acid.

It will not be unintereſting to give in a few words the method by which this excellent chemiſt proceeded in the analyſis of this very compounded water.

A given quantity, quite hot from the ſpring, was firſt included in a retort of known capacity, and brought to boil, and the boiling continued till no more air-bubbles were given out. The gas was carefully collected over water, and when examined, was found by the teſt of lime-water to be pure carbonic acid, excepting the portion of common air of the veſſels. This way, however, was not quite ſo accurate as if a mercurial bath had been employed.

The exiſtence of iron in this water, (as in the Bath water,) is only ſenſible to teſts when applied immediately at the ſpring itſelf. Under theſe circumſtances, if ſome of the freſh water is put into a bottle containing a ſlice of the gall-nut, a very ſenſible purple colour is produced immediately. But on cooling, the minute quantity of iron which it contains ſeparates as a fine flocculent whitiſh-brown oxyd, and the teſt of galls no longer produces any effect.

To diſcover the actual quantities of the ingredients, 100 cubic inches of the water were gradually evaporated to a ſmall bulk, during which, an earthy ſediment ſubſided, which was ſeparated by the filtre. This ſediment was digeſted with muriatic acid, which diſſolved only a part, and left a looſe ſlimy earth, which proved to be ſilex. The muriatic ſolution was then treated with pruſſiat of potaſh, which cauſed a blue precipitate of pruſſiatic iron to ſubſide, after which, the lime that remained in the ſolution was thrown down by carbonated alkali. The pruſſian blue therefore indicated the quantity of *oxyd of iron* in the water, and the carbonated alkali reproduced the *carbonat of lime.*

It then remained to ſeparate the ſalts from the clear ſolution, being the water leſſened to a few ounces by evaporation.

It having been proved by previous teſts that the water contained a naked alkali, probably carbonat of ſoda, and a ſalt with ſulphuric acid, and another with muriatic acid, the baſis of which was not an earth, but an alkali, there remained little doubt but that ſoda was the baſe in all, (no other freed alkali being ever found in mineral waters.) The only object that remained, therefore, was to eſtimate the actual quantity of uncombined carbonat of ſoda, and the quantity of the ſulphuric and muriatic acids.

Previous experiments having been made on the power of a given ſulphuric acid to ſaturate ſoda, ſome of the ſame acid was added to the water till an accurate ſaturation of the naked alkali was produced, by which the quantity of the latter was diſcovered. The whole was then decompoſed by acetited barytes, and the ſulphuric acid of the ſulphat of barytes formed thereby conſiſted therefore of the portion of acid added to ſaturate the uncombined ſoda, and of that which already exiſted in the water in the form of ſulphat of ſoda. By ſubtracting the former portion from the whole quantity of acid indicated by the ſulphat of barytes produced, the remainder was the acid belonging to the ſulphat of ſoda in the water originally, whence the proportion of this ſalt could alſo be eſtimated. Laſtly, the quantity of muriated ſoda was found by precipitating the muriatic acid by nitrated ſilver.

From theſe experiments it is concluded, that a hundred cubic inches of the Carlſbad water contain,

| | grains. |
|---|---|
| Of dry carbonated ſoda, - - - - - | 39 |
| (equal to 107$\frac{1}{2}$ gr. when cryſtallized.) | |
| Of dry ſulphat of ſoda, - - - - - | 70$\frac{1}{2}$ |
| (equal to 168 gr. cryſtallized.) | |
| Of muriat of ſoda, - - - - - - | 34$\frac{1}{2}$ |
| Carbonat of lime, - - - - - | 12 |
| Silex, - - - - - - | 2$\frac{1}{2}$ |
| Oxyd of iron, about - - - - | $\frac{1}{8}$ |
| | 158$\frac{3}{4}$ |

Of carbonic acid, 32 cubic inches.

The cubic inch of water here uſed is equivalent to 290 grains of diſtilled water.

The average quantity of water daily drank by the viſitors is not leſs than about five pints, divided in about fourteen cups. The uſual time ſpent in the uſe of the water is about four weeks. The water is uſed in a great variety of diſorders. It is highly ſerviceable in dyſpeptic complaints, obſtructions of the abdominal viſcera, diſeaſes of the kidnies, and urinary paſſages, and of the uterine ſyſtem in females.

The actual quantity of ſaline matter which is conſtantly poured out with the water, (almoſt the whole of which is waſted) is very enormous when the eſtimate is carried to the ſupply of water during a year. Dr. Becher eſtimates the main ſpring alone to throw out hourly 705 eimers, each eimer being about half a cubic foot; and hence in the year it will throw out 3,087,900 cubic feet. Theſe contain the following quantities of ſalts, (reduced to pounds avoirdupois.)

| | |
|---|---|
| Cryſtallized carbonat of ſoda, | 746,884 |
| ———— ſulphat of ſoda, | 1,132,923 |
| Muriat of ſoda, - - | 238,209 |

beſides earths and iron, and alſo 992,529 cubic feet of carbonic acid gas.

It is eſtimated alſo that the water of all the other ſprings united, equals that of the great ſpring, whence the above numbers may be doubled, and this large quantity has been annually poured out, for a certainty, during 430 years, to the year 1800.

No other advantage is made of this ſpring by way of manufacture, except that annually ſome hundred pounds of ſulphat of ſoda are prepared from it.

CARLSBRUN, in *Geography*, a town of Bohemia, in the circle of Chrudim; 6 miles S. of Leutmiſchl.

CARLSBURG, a village of Germany, in the circle of Franconia, and biſhopric of Wurzburg, with a caſtle, built by Charles the Bald, ſituate on the Maine, oppoſite to Carlſtadt.

CARLSCRONA, or CARLESCROON, a ſea-port town of Sweden, in the province of South Gothland, which derives its origin and name from Charles XI. who laid the foundations of a new town in 1680, and removed the fleet from Stockholm to this place, on account of the advantageous ſituation, and ſecurity of the harbour. The greater part of the town ſtands upon a ſmall rocky iſland, which riſes gently in a bay of the Baltic; the ſuburbs extend over another ſmall rock, and along the mole cloſe to the baſon, where the fleet is moored. The way into the town from the main land is carried over a dyke, and along two wooden bridges joined by a barren rock. The town is ſpacious, conſiſting of ſome houſes of brick, but moſtly of wood, and one or two handſome churches, and containing about 18,000 inhabitants. The ſuburbs are fortified towards the land by a ſtone wall. The entrance into the harbour, which is naturally difficult, on account of a number of ſhoals and rocky iſlands, is ſecured from the attack of an enemy's fleet by ſtrong forts, built on two iſlands, under the batteries of which all veſſels muſt paſs. A dock, planned by Polhem, has been hollowed in the ſolid rock; it was begun in 1714, and finiſhed in 1724; but having been found too ſmall, it has been ſince enlarged, and is capable of receiving a ſhip of the firſt rate. Its dimenſions are 190 Swediſh feet in length, 33 in depth, and 46 in breadth; and it contains 300,000 cubic feet of water, of which it is uſually emptied in 10 hours, by the labour of 90 men, who are employed at the ſame time in pumping, and relieved every half hour. As this is at preſent the only receptacle of ſhips under repair, new docks have been projected and begun upon a ſtupendous plan; in the execution of which it was propoſed to conſtruct 30 docks, for building and laying up the largeſt ſhips, at the extremity of the harbour. A baſon, capable of admitting two men of war, was deſigned to communicate, by ſluices, with two ſmaller baſons, from each of which it was propoſed to extend five rows of covered docks; each row being ſeparated by walls of ſtone, and each dock provided with ſluice-gates, ſo as to be filled or emptied by means of pumps. Cloſe to the docks, it has been intended to conſtruct magazines for naval ſtores, and to incloſe the whole with a ſtone wall. This project was begun in 1757, and reſumed by Guſtavus III. At the commencement of the works, 25,000l. were annually expended; but the ſum has been ſince leſſened to about 6000l. per annum, and the number of docks reduced to 20. The primary intention of this grand plan was to obtain dry docks, for the purpoſe of keeping the whole fleet entirely covered from wind and weather. Difficulties have, however, occured, which have retarded the completion of this work; and in many years they have only finiſhed one dock, the bottom and ſides of which are of hewn granite, with rows of granite pillars that ſupport the roof: ſo that it bears rather the appearance of a colonnade to a temple than a receptacle for ſhips.

The ſhips are built at Carlſcrona chiefly by Engliſh artiſts; and as the provinces of Blekinge and Skone, though they abound with oaks, do not furniſh enough for a continued ſupply, the Swedes procure their ſhip-timber from Germany. From their own territories they are ſupplied with maſts and deals, pitch and tar, and the greater part of the flax uſed in the navy; the ropes and ſails are manufactured from Riga hemp. They caſt cannon, and make gunpowder with Swediſh ſaltpetre. The harbour of Carlſcrona is large and commodious, with depth of water ſufficient for ſhips of the firſt rate to carry their lower tier of guns. This town is the 10th in order of the towns that vote in the diet. N. lat. 56° 20′. E. long. 15° 26′ 15″. Coxe's Travels, vol. iv.

CARLSFELD, a mine-town of Germany, in the circle of Erzgebirg, ſeated on the river Wiltzſch. It was founded in 1678.

CARLSGRAF CANAL. See CANAL.

CARLS-INſEL, *Great and Little*, or *Charles's iſlands*, lie about a Swediſh mile from the coaſt of the iſland of Gothland; in which was formerly a quarry of marble, uſed for building the churches of Gothland.

CARLSKAMN, or CARLSHAVEN, Lat. *Caroli portus*, a ſea-port of Sweden, in the province of Blekinge, on the Baltic, built in 1658 by Charles X. and improved and fortified by Charles XI. In this town are a woollen manufacture, a forge for copper, and a timber-yard. It has the 19th vote in the diet, contains about 1200 inhabitants, and is diſtant 22 miles W. from Carlſcrona.

CARLSMARCKT, a town of Sileſia, in the principality of Brieg; ſeated on the river Stover, and 9 miles E. of Brieg.

CARLSRUHE, or KARLSRUH, a town of Germany, in the circle of Swabia and margraviate of Baden, ſituated in a foreſt, where the prince has a fine palace and gardens. It was founded by the margrave, Charles-William, in 1715, and is conſtructed on a regular plan. It conſiſts of one principal ſtreet, about an Engliſh mile in length, which is at a conſiderable diſtance in front of the palace, and in a direction parallel with it. All the other ſtreets go off at right angles from this, and are ſo arranged, that the view in each of them is terminated by the front of the palace. The houſes are as uniform as the ſtreets, being all of equal ſize and height. Here are four churches, two for Roman Catholics and two for Proteſtants, a ſynagogue for the Jews, and about 400 houſes. The margrave of Baden has contrived every means in his power to introduce induſtry and manufactures among his people. Accordingly there is a conſiderable number of Engliſh tradeſmen in this place, employed in manufactures ſimilar to thoſe of Birmingham, and inſtruct the inhabitants in that buſineſs. Here are alſo many watchmakers from Geneva, whom the prince has engaged to ſettle in the town by granting them various privileges. Carlſruhe is diſtant 2½ miles N.W. from Durlach, and 11 S. from Philipſburg.

CARLSTADT, a town of Sweden, in the province of Warmeland, built on the iſland of Tingwalla, formed by the two branches of the Clara-Elb river, which, after encompaſſing it, unite and fall into the lake Wenner. The iſland is 12 miles, and the town 1½ mile in circumference. It was built by Charles IX. whoſe name it bears. The ſtreets are broad and ſtraight; and, excepting the cathedral and ſchool, the houſes are conſtructed of wood painted. It is a biſhop's ſee; and the epiſcopal palace, which is likewiſe of wood, but not painted, has a front ſo extenſive, and with ſo many windows, that it appears like a manufactory. The town contains 1500 inhabitants, who carry on a commerce of iron and wood acroſs the Wenner, and import ſugar, tea, and ſpices. It has a linen and woollen manufacture, and in its vicinity is a medicinal ſpring. In the order of the diet it has the 38th voice, and is a place of conſiderable trade. N. lat. 51° 21′. E. long. 13° 18′.

CARLSTADT, a town of Germany, in the circle of Franconia, and biſhopric of Wurzburg, on the Maine; 12 miles N.W. of Wurzburg.

CARLSTEIN. See MARSTRAND.

CARLUCAT. See CARLUS.

CARLUDOVICA, in *Botany*. Boſc. Nouv. Dict. Flor. Peruv. pl. 31. Claſs and order, *monœcia polyandria*. Nat. order, *palmæ*.

Gen. Ch. *Cal.* ſpathe univerſal; leaflets four, lanceolate, concave, ſtriated, enveloping one another, caducous, terminated by four or five points; ſpathe common cubical, four-flowered; ſpathe proper oval, crowned with numerous round teeth. *Cor.* none. *Stam.* in the male flowers numerous, very ſhort, inſerted into the receptacle. *Piſt.* in the female flowers; germ cubical, hollowed at the top into two furrows croſſing each other; ſtyles four, filiform, very long; ſtigma reſembling an anther. *Peric.* berry cubical, one-celled. *Seeds* numerous, ſmall, oblong, even. The male and female flowers are intermingled on the ſame ſpadix.

CARLUS, or CARLUX, in *Geography*, a town of France, in the department of the Dordogne, and chief place of a canton in the diſtrict of Sarlat; 6 miles E. of Sarlat. The place contains 619, and the canton 5863, inhabitants: the territory comprehends 122½ kiliometres and 15 communes.

CARMACÆ, in *Ancient Geography*, a people of European Sarmatia, placed by Pliny in the vicinity of the Palus Mæotis.

CARMAGNOLA, in *Geography*, a fortified town of Piedmont, in the marquiſate of Saluzzo, which formerly gave the title of count to the eldeſt ſon of the marquis. The name is a diminutive of Carmagna, which was a town in its neighbourhood, that ſunk in ſize and importance, whilſt the latter, by an acceſſion of its inhabitants, increaſed. In the war between the French and Imperialiſts, 1691, it was fortified by the former, and made one of the ſtrongeſt places on the frontiers of Piedmont. The four fauxbourgs built by the French at ſome diſtance from the town are well peopled, and divided into four pariſhes. Within the walls Carmagnola has only one pariſh; and the whole number of inhabitants in the fauxbourgs and the town is eſtimated at 6500. The market is well ſupplied, and much frequented by perſons from the adjacent countries, as well as by the Piedmonteſe themſelves. It is 11 miles S.S.E. of Turin, and 13 N.N.E. of Saluzzo. N. lat. 44° 42′. E. long. 7° 34′.

CARMANA, in *Ancient Geography*, a town of Aſia, the capital of Carmania, according to Ptolemy, ſituated in the interior of the country, in Carmania properly ſo called, but not far from the deſert.—Alſo, an iſland, near the coaſt of Carmania. Steph. Byz.

CARMANDA, *Elmeſetana*, a large and flouriſhing town of Syria, ſituated on the banks of the Euphrates, according to Xenophon, who relates, that the army ſtationed on the oppoſite bank, furniſhed itſelf with ſubſiſtence in this city by paſſing the river on rafts. It was ſituated W. S. W. of Anatho.

CARMANIA, a country of Aſia, ſituate between Perſia on the north-weſt, and Gedroſia on the ſouth-eaſt; and reckoned by ſome geographers a province of Perſia, taken in its greateſt extent. According to Ptolemy, Carmania is divided into Carmania the Deſert, and Carmania Proper. The former is bounded on the north by Parthia; on the weſt by Perſia; on the eaſt by Drangiana; and on the ſouth by Carmania Proper. The latter has on the ſouth the Indian Ocean; on the weſt Perſia and the Perſian Gulf: on the eaſt Gedroſia, and on the north Carmania the Deſert. It was inhabited by the Iſatichæ, Zuthi, Gadanopydres or Ganandopydnæ, Camelobоſci, Agdonites or Agdioutes, Rhudianæ, Æres, Charadnæ, Paſargadæ, and Armozæi. The ancient cities were Carmana, now Kerman, Alexandria, Armuza or Armozus, on the ſhore of the gulf, giving name to a promontory, and to the iſland of Ormuz, &c. &c. Its rivers were Arapis, Carius, Archidana, Saganus, and Andanis. Its promontories were Armozus and Carpella. Among its mountains Ptolemy diſtinguiſhes that which was called Mons Semiramidis, and another under the name of Mons Strongalus. Its dependent iſles, in the Perſian Gulf, were Sugdiana and Vorocchtha, or Oaroćta; and in the Indian Ocean Polla, Carminna and Liba.

Ptolemy makes a very marked diſtinction between Carmania Deſert and Carmania Proper, and the difference between them, indicated by nature, is allowed by Ammianus Marcellinus. As to the firſt, the appellation given to it by Ptolemy was ſtrictly appropriate; as it had ſcarcely a town or village in it; its ſoil being an inhoſpitable ſand, its air hot and unhealthy, and the whole province almoſt deſtitute of water. Carmania Proper, on the other hand, was a much more fertile country, producing a variety of very large trees, with the exception, however, of olives. Strabo. lib. xv. It was watered by ſeveral rivers, particularly the Andanis, mentioned by Ptolemy and Pliny; although it was mountainous, its mountains had mines of copper and iron. Pomponius Mela, who lived under Tiberius and Claudius, gives a very unfavourable account of the condition of the Carmanians, and of their mode of life; for, ſpeaking of the Carmanians who navigated the Perſian Gulf, he ſays they were deſtitute of cloathing, corn, cattle, and houſes; that they covered themſelves with the ſkins of fiſhes, and eat their fleſh, and that their whole bodies were hairy. Probably this deſcription relates to what Pomponius Mela had heard concerning the inhabitants of the coaſt of Gedroſia, who were denominated "Ichthyophagi."

In more modern times, however, the province of Carmania has been remarkable for producing ſheep, which bear the fineſt wool in the world; and they are ſaid to have this peculiar property, that, having fed upon new graſs from January to May, their fleeces fall off of themſelves, and leave the ſheep quite naked; when the wool is gathered and beaten, the coarſe ſeparates and the fine only remains. The Gaurs have reſerved this manufacture to themſelves, which conſiſts in girdles much eſteemed through the Eaſt, and in a ſort of ſerges, as ſoft and almoſt as fine as ſilk. The iſle of Ormus is dependant on this province. See KERMAN and ORMUS.

CARMANICUS SINUS, or Gulf of Carmania, the name given by Ptolemy to the Perſian Gulf: the ſea which waſhed the coaſts of Carmania was called *Carmanium Pelagus*; and the ancient name of mount *Pangæus* was, according to Plutarch, *Carmanius Mons.*

CARMANOR, a name which, according to Plutarch, *(De Fluv.)* was given to the river Inachus; and mount *Tmolus* was, as he ſays, denominated *Carmanorius mons*, from Carmanor, the ſon of Bacchus, who had there loſt his life in hunting.

CARMARA, a town of India, placed by Ptolemy on this ſide of the Ganges.

CARMATHIANS, or KARMATIANS, in *Hiſtory*, an Arabian ſect, which bore an inveterate malice againſt the Mahometans, and which began to occaſion diſturbances in the year of the Hegira 277, A. D. 890. It is ſaid to have derived its origin from an Arabian preacher of the name of Carmath, in the neighbourhood of Cufa, who aſſumed the lofty and incomprehenſible ſtyle of the guide, the director, the demonſtration, the word, the holy ghoſt, the camel, the herald of the Meſſiah, who had converſed with him in a human ſhape, and the repreſentative of Mohammed, the ſon of Ali, of St. John the Baptiſt, and of the Angel Gabriel. In his myſtic volume, the precepts of the Koran were refined to a more ſpiritual ſenſe; he relaxed the duties of ablution, faſting, and pilgrimage; allowed the indiſcriminate uſe of wine and forbidden food; and nouriſhed the fervour of his diſciples by the daily repetition of 50 prayers. The idleneſs and ferment of the ruſtic crowd awakened the attention of the magiſtrates of Cufa; a timid proſecution aſſiſted the progreſs of the new ſect; and the name of the prophet became more revered after his perſon had been withdrawn from the world. Carmath, or Karmata, contrived by his fanaticiſm to form a very large party of followers, out of whom he choſe 12, as his apoſtles, to govern the reſt, and to propagate his doctrines. The governor of the province ſeized the prophet, and committing him to priſon, ſwore that he ſhould die; but a damſel belonging to the governor, overhearing this menace, took the key of the dungeon from under her maſter's head as he ſlept, and having releaſed the priſoner, returned it to the place from which ſhe had taken it. His adherents took this occaſion of reporting, that God had taken the prophet, who had made his eſcape, into heaven. He appeared afterwards in another province, and declared to his followers, that it was not in the power of any one to do him hurt; notwithſtanding which, his courage failing him, he retired into Syria, and was not heard of any more. His ſect, however, continued and increaſed; and his 12 apoſtles diſperſed themſelves among the Bedoweens, "a race of men," ſays Abulfeda, "equally devoid of reaſon and of religion;" and by the ſucceſs of their preaching, they threatened Arabia with a new revolution. The Carmathians were ripe for rebellion, ſince they diſclaimed the title of the houſe of Abbas, and abhorred the wordly pomp of the caliphs of Bagdad. They were ſuſceptible of diſcipline, ſince they vowed a blind and abſolute ſubmiſſion to their Iman, who was called, in their apprehenſion, to the prophetic office by the voice of God and the people. Inſtead of the legal tithes, he claimed the fifth of their ſubſtance and ſpoil; the moſt flagitious crimes were no more than the type of diſobedience; and the brethren were united and connected by an oath of ſecrecy. After a bloody conflict, they prevailed in the province of Bahrein, along the Perſian Gulf; the tribes of the deſert were ſubject to the ſceptre, or rather to the ſword, of Abu Said and his ſon Abu Taher; and theſe rebellious Imams could muſter in the field 107,000 fanatics. The mercenaries of the caliph were diſcomfited in every action; the cities of Racca and Baalbec, of

Cufa and Baſſora, were taken and pillaged; Bagdad was filled with conſternation; and the caliph trembled behind the veils of his palace. Abu Taher advanced with 500 horſe to the gates of the capital; but being appriſed of his danger, and adviſed to make his eſcape, the intrepid Carmathian replied to his cautious and timid friend, ſent to him by order of the enemy, "Your maſter is at the head of 30,000 ſoldiers; three ſuch men as theſe are wanting in his hoſt;" at the ſame inſtant, turning to three of his companions, he commanded the firſt to plunge a dagger into his breaſt, the ſecond to leap into the Tigris, and the third to caſt himſelf headlong down a precipice. They obeyed without a murmur. "Relate," continued the Imam, "what you have ſeen; before the evening your general ſhall be chained among my dogs." Before the evening, the camp was ſurpriſed and the menace executed. The rapine of the Carmathians was ſanctified by their averſion to the worſhip of Mecca; they robbed a caravan of pilgrims, and 20,000 devout Moſlems were abandoned on the burning ſands to a death of hunger and thirſt. Another year they ſuffered the pilgrims to proceed without interruption; but in the feſtival of devotion, Abu Taher ſtormed the holy city, and trampled on the moſt venerable relics of the Mahometan faith. Thirty thouſand citizens and ſtrangers were put to the ſword; the ſacred precincts were polluted by the burial of 3000 dead bodies; the well of Zemzem overflowed with blood; the golden ſpout was forced from its place; the veil of the Caaba was divided among theſe impious ſectaries, and the black ſtone, the firſt monument of the nation, was borne away in triumph to their capital. After this deed of ſacrilege and cruelty, they continued to infeſt the confines of Irak, Syria, and Egypt; but the vital principle of enthuſiaſm had withered at the root. Their ſcruples or their avarice again opened the pilgrimage of Mecca, and reſtored the black ſtone of the *Caaba* (which ſee); and it is needleſs to inquire into what factions they were broken, or by whoſe ſwords they were finally extirpated. It will be ſufficient to obſerve, that the ſect of the Carmathians may be conſidered as one viſible cauſe of the decline and fall of the empire of the caliphs. D'Herbelot, art. *Carmath.* Sale's Koran, Prelim. Diſcourſ. p. 184. Gibbon's Hiſt. vol. x. p. 74, &c. See Abudhaher.

CARMEAUX, in *Geography*, a town of France, in the department of the Tarn; two leagues N. of Alby.

CARMEL, in *Ancient Geography*, a mountain of Paleſtine, or as it has been otherwiſe called Syria or Phœnicia, ſituate in the pachalic of Saide or of Acre, commanding the bay of Acre to the ſouth, and forming one of the moſt remarkable head-lands on the whole coaſt of the Mediterranean. It is in the form of a flattened cone, and very rocky, and, as Volney ſays, about 2000 feet high. This mountain is ſuppoſed to have derived its name from its fertility; the word *Carmel*, according to its Hebrew import, ſignifying the "vine of God" and denoting a fruitful ſpot, or a place planted with fruit trees. To this purpoſe Volney informs us, (Travels in Egypt and Syria, vol. ii. p. 228), that among the brambles are ſtill found wild vines and olive-trees, which prove that induſtry had formerly been employed even on this ungrateful ſoil. To the ſouth of this mountain, which extends eaſtward from the ſea as far as the plain of Jezreel, or Eſdraelon, the country preſents a chain of rugged mountains, on the tops of which are many oaks and fir-trees, which furniſh a retreat for wild boars and lynxes. At the foot of this mountain, north, runs the brook Kiſhon, and a little farther the river Belus. Joſephus makes Carmel a part of Galilee; in the diviſion of the holy land made by Joſhua, it fell to the lot of the tribe of Aſher; but this tribe having remained in captivity with the other tribes of Iſrael, it returned to the Phœnicians, its original maſters, according to St. Jerome.

Carmel is not only the name of the mountain, but of a city which is ſaid to have been built upon it, and of a heathen deity worſhipped in it, without either temple or ſtatue, as Tacitus ſays, (Hiſt. l. ii. c. 78.), and having only an altar upon which ſacrifices were offered to the deity. It is ſuppoſed, however, that there muſt have been ſome temple upon it, ſince Jamblichus (in Vit. Pythag.) informs us, that this place was the favourite retreat of Pythagoras, who ſpent much time alone in the temple. Accordingly the Greeks called it Ὄρος καὶ ἱερὸν Διός, the mountain and temple of Jupiter. Suetonius ſays, that Veſpaſian aſcended this mountain, and offered a ſacrifice to the deity of the place, when he came into Syria in order to ſubdue the Jews who had revolted. This mountain has been celebrated and revered among chriſtians on account of its having been the reſidence of Elijah, who is ſuppoſed to have lived in a cave, which is there ſhewn, before he was taken up into heaven; and in the ſummit of it is a chapel dedicated to this prophet, which affords an extenſive proſpect over the ſea and land. This is alſo ſaid to have been the ſcene, where Elijah called for a fire from heaven, which conſumed the divine ſacrifice, thus convincing the Iſraelites of their folly in heſitating between their God and Baal. (1 Kings, xviii.) On this account the Chriſtians began, from the earlieſt ages, to manifeſt a more than ordinary veneration for it; and both the mountain and cave of Elijah, as well as the place where they ſay his garden was, are viſited and reverenced not only by Chriſtians and Jews, but alſo by the Mahometans. We are likewiſe told, that a church with a monaſtery was erected on this mountain in ſome of the early ages of Chriſtianity, and that when, by the lapſe of time and the fury of its enemies, it was decayed and almoſt deſtroyed, a new one was afterwards erected by the zeal of a Calabrian prieſt, who founded the order of the Carmelites, ſince ſpread through all the Roman Catholic countries, and of whom there is ſtill a certain number, living in this ancient monaſtery. See Carmelites.

Carmel was alſo a city of Paleſtine in the ſouthern part of the tribe of Judah, ſeated on a mountain of the ſame name, which was part of a long chain of mountains, that paſſed through the ſouthern part of Paleſtine and near the lower coaſt of the Aſphaltite lake, and bounded the country of the Amalekites. This city was the reſidence of Nabal the carmelite, Abigail's huſband; and it was on this mountain that Saul returning from his expedition againſt Amalek, erected a trophy. (1 Sam. xv. 11.)

Carmel, *Knights of Mount*, are a military order of knights Hoſpitallers, inſtituted in 1607, by Henry IV. of France, under the title, habit, and rule of *our Lady of Mount Carmel*, and in conſequence of a bull of pope Paul V. in 1608, united to the order of St. Lazarus of Jeruſalem, with all its commanderies, priories, and other goods for its endowment. The founder propoſed it to conſiſt of one hundred French gentlemen, who ſhould be obliged, in times of war, to march cloſe to the kings of France, as their guard. Authors are much divided, whether to call this a new inſtitution, or a reſtoration of that of St. Lazarus; though it is generally accounted a new inſtitution. See Lazarus.

Carmel, in *Geography*, a townſhip of America, in Dutcheſs county, New York. By the ſtate cenſus of 1796, 237 of its inhabitants were electors.

Carmel *water*, in *Geography*, a river of Scotland, which runs into the Irvine, in Renfrewſhire.

CARMELITE Water. See Carmes, *Eau de.*

CARMELITES, or *White Fryars*, or the *order of our Lady of Mount Carmel*, an order of religious, making one of the four tribes of mendicants, or begging friars; and taking both the name and origin from *mount Carmel*, (above deſcribed), formerly inhabited by the prophets Elijah and Eliſha, and by the children of the prophets; from which this order pretend to deſcend in an uninterrupted ſucceſſion.

The manner in which they make out their antiquity has ſomething in it too ridiculous to be rehearſed. Some among them pretend they are deſcendants of J. C. who, as well as the virgin Mary, are ſaid to have aſſumed the habit and profeſſion of Carmelites. Others go farther, and make Pythagoras a Carmelite, and the ancient Druids regular branches of their order. The learned Jeſuit, Papebroch, was accuſed before the tribunal of the Roman pontiff, by the Carmelites, on account of his having called in queſtion the dignity and high antiquity of their order. The conteſt on this ſubject was long and tedious; but it was ſo far determined, or at leaſt ſuſpended, in the year 1698, by Innocent XII., that ſilence was impoſed upon the contending parties; although the Carmelites affirm to this very day, that the prophet Elijah was the parent and founder of their ancient community.

Phocas, a Greek monk, ſpeaks the moſt reaſonably; he ſays, that in his time, viz. in 1185, Elijah's cave was ſtill extant on the mountain; near which were the remains of a building, which intimated there had been anciently a monaſtery; that ſome years before, an old monk, a prieſt of Calabria, whoſe name was Berthold, by revelation, as he pretended, from the prophet Elijah, fixed there, and aſſembled ten brothers. In 1205, Albert, patriarch of Jeruſalem, gave the ſolitaries a rigid rule; which Papebroch has ſince printed. This rule conſiſted of 16 articles; one of which confined them to their cells, and enjoined them to continue day and night in prayer; another prohibited the brethren having any property; another enjoined faſting from the feaſt of the holy croſs till Eaſter, except on Sundays; abſtinence at all times from fleſh was enjoined by another article; one obliged them to manual labour; and another impoſed upon them a ſtrict ſilence from veſpers till the tierce the next day. In 1217, or according to others, 1226, pope Honorius III. approved and confirmed this rule; though it was afterwards mitigated by Innocent IV. On the concluſion of the peace between the emperor Frederic II. and the Saracens in 1229, the Carmelites quitted the Holy Land, under Alan the fifth general of the order. Some of them were ſent to Cyprus, in 1238, and founded a monaſtery in the foreſt of Fortania. Some Sicilians at the ſame time returned to their own country, and founded a monaſtery in the ſuburbs of Meſſina. St. Louis brought ſome of theſe Carmelites with him from the Holy Land into France. Many of the popes gave them the title of "Brothers of the Bleſſed Virgin."

The Carmelites came into England in the year 1240, and erected a great number of monaſteries. Their firſt houſes were at Alnwick in Northumberland, and Ailesford in Kent. In England and Wales they had about forty houſes. This order is eminent for the devotion of the ſcapulary, for its miſſions, and for the great number of ſaints with which it has ſtocked the Romiſh church. In the 17th century, there were four canonizations in this order, viz. of S. Thereſa, S. Andrew Corſin, S. Mag. de Pazzi, and S. J. de la Croix.

In the 16th century St. Thereſa, a Spaniſh lady of an illuſtrious family, undertook the difficult taſk of reforming the Carmelite order, which had departed much from its primitive ſanctity, and of reſtoring its neglected and violated laws to their original credit and authority. Her aſſociate in this arduous attempt was Johannes de Santa Cruſa, and her enterpriſe was not wholly deſtitute of ſucceſs, notwithſtanding the oppoſition ſhe met with from the greateſt part of the Carmelites. Hence the order was, during the ſpace of 10 years, divided into two branches; of which one followed a milder rule of diſcipline, while the other embraced an inſtitute of the moſt ſevere and ſelf-denying kind. The former, viz. *Carmelites of the ancient obſervance*, were called the *mitigated*, or *moderate*; and the latter, or thoſe of the *ſtrict obſervance*, were called *Bare-footed Carmelites.*

The *ancient obſervance* has only one general, under whom are forty provinces; and the congregation of Mantua, which has a vicar-general.

*Bare-footed* Carmelites are a reform of the ancient *Carmelites*, ſet on foot in 1540, by St. Thereſa; ſo called from their going bare-footed.

She began with the convents of nuns, whom ſhe reſtored to the primitive auſterity of the order, which had been mitigated by Innocent IV. in 1245, and at length carried the ſame reform among the friars. Pius V. approved the deſign, and Gregory XIII. confirmed the reform in 1580; at the particular deſire of Philip II., king of Spain. This ſeparation of the bare-footed Carmelites from thoſe of the ancient obſervance was confirmed, in 1587, by Sixtus V., and completed, in 1593, by Clement VIII., who allowed the former to have their own chief, or general. But, after having withdrawn themſelves from the others, theſe auſtere friars quarrelled among themſelves, and in a few years their diſſenſions arrived at ſuch a height, that they were divided anew, by the pontiff laſt mentioned, into two communities, each of which was governed by its reſpective general, and had its peculiar conſtitutions: the one *the congregation of Spain*, divided into ſix provinces; the other called *the congregation of Italy*, comprehending all the reſt, not depending on Spain.

The habit of the Carmelites was at firſt white, and the cloak laced at the bottom with ſeveral liſts. But pope Honorius IV. ordered it to be changed for that of the Minims. Their ſcapulary is a ſmall woollen habit of a brown colour, thrown over their ſhoulders. Inſtead of linen ſhirts, they wear linſey-wolſey, which they change twice a week in the ſummer, and once a week in the winter.

CARMELO, in *Geography*, a river on the coaſt of New Albion, S.E. of Franciſco bay. N. lat. 36° 55′.

CARMELUM Promontorium, in *Ancient Geography*, a maritime point of mount Carmel near *Caipha*. See Acre.

CARMELUS, in *Mythology*, a deity of the Syrians, who inhabited the vicinity of mount Carmel. He had an altar, but no temple. Tacitus (Hiſt. II. 78.) ſays, that a prieſt of this deity predicted to Veſpaſian, that he ſhould be emperor.

CARMEN, an ancient term among the Latins, uſed, in a general ſenſe, to ſignify a verſe; but in a more peculiar ſenſe to ſignify a ſpell, charm, form of expiation, execration, &c. couched in a few words, placed in a myſtic order, on which its efficacy depended.

Pezron derives carmen from the Celtic *carm*, the ſhout of joy, or the verſes which the ancient bards ſung, to encourage the ſoldiers before the combat; adding, that the Greek χαρμη ſignifies combat and joy; which is true: but then it does not come from the Celtic *carm*, but from χαιρω, I rejoice.

Some fetch the origin of the poetical *carmina*, or verſes, hence; and ſay, they took that name from their reſemblance to theſe ſpells: others, on the contrary, ſay, that the ſpells had their origin from the poetical verſes, and took their name from their reſemblance to thoſe: it is at leaſt certain, that many of the ancient charms, wherewith diſeaſes were ſuppoſed to be cured, were metrical verſes, to which, in thoſe ages, greater efficacy was aſcribed than to mere words or proſe.

Vigenere, again, derives *carmen* from *Carmenta*, becauſe that propheteſs couched her predictions in verſes, or ſhort periods: but others ſay, the propheteſs took the name *Carmenta* from *carmen*, on the ſame account.

Carmen, was anciently a denomination given to precepts, laws, prayers, imprecations, and all ſolemn formulæ, couched in a few words, placed in a certain order, though written in proſe.

In which ſenſe it was, that the elder Cato wrote a "Carmen de moribus," which was not in verſe, but proſe.

Carmen *ſaliare*, a ſet of ancient verſes compoſed by Numa, ſung by the salii, accompanied by the claſhing of *Ancylia*, or ſacred bucklers. See Ancyle.

Carmen alſo denotes a form of prayer, or words whereby divers among the ancients devoted themſelves. Such was that of the Decii, ſpoken of by Pliny, Hiſt. Nat. lib. xxxviii. cap. 2.

Carmen, or *Karmoe*, in *Geography*, an iſland near the weſt coaſt of Norway, about 14 miles long and two broad. N. lat. 59° 30′. E. long. 5° 29′.

CARMENIAN Wool, a denomination given to a kind of goat's hair, brought from Carmenia, or Carmania, a country of Aſia Minor. See Carmania.

CARMENTALIA, a feaſt among the old Romans, cebrated annually on the 11th of January, in honour of *Carmenta*, or *Carmentis*, a propheteſs of Arcadia, mother of Evander, with whom ſhe came into Italy, 60 years before the Trojan war. After her death ſhe was admitted into the number of the *Dii indigetes* of Rome. Dionyſius Hal. and Plutarch ſay, that Carmenta was the "Themis" of the Greeks. The ſolemnity was alſo repeated on the 15th of January, which is marked in the old calendar by *Carmentalia relata*. This feaſt was eſtabliſhed on occaſion of a great fecundity among the Roman dames, after a general reconciliation with their huſbands, with whom they had been at variance, in regard of the uſe of coaches being prohibited them by an edict of the ſenate.

The women celebrated this feaſt: he who offered the ſacrifices was called *Sacerdos Carmentalis*.

Authors are divided about the origin of the word *Carmenta:* Vigenere ſays, the propheteſs was ſo called *quaſi carens mente*, out of her ſenſes; by reaſon of the enthuſiaſm ſhe frequently fell into. Others ſay, ſhe took her name from *carmen*, verſe; becauſe her prophecies were couched in verſes: but Vigenere, as before noted, maintains *carmen* to be derived from *Carmenta*.

CARMENTALIS Porta, in *Ancient Geography*, a gate of Rome, ſituated on the banks of the Tiber, at the foot of the Capitol, in the place called "Montanara." It was alſo called *Scelerata*, becauſe the 300 Fabians, defeated by the Etruſcans, on the banks of the Cremera, made their eſcape from Rome through this gate.

CARMES, Eau de, the Carmelite water, or compound balm water, famous in France, and moſt parts of Europe for its extraordinary cordial virtues. It is ſaid to be extremely reviving, to be good in all ſorts of fits, apoplexies not excepted; and to relieve the gout when it attacks the ſtomach. The Carmelites at Paris, who make conſiderable advantage by vending this water, keep the preparation of it a great ſecret. See Melissa.

CARMINATIVE, in *Medicine*, a denomination formerly applied to thoſe articles of the Materia Medica, which poſſeſs the property of diſpelling wind from the ſtomach.

The origin of this abſurd term has been aſcribed to thoſe times of ignorance and ſuperſtition, when the practice of medicine, in the hands at leaſt of ſordid and deſigning men, was intimately connected with magic, jugglery, and other modes of deception; among which, incantations in verſe (*carmina*), repeated during or previouſly to the adminiſtration of the remedies, were frequently reſorted to. In ſeveral nervous diſorders, eſpecially in ſlight hyſterical complaints, and in ſome of the forms of *dyſpepſia*, or indigeſtion, the operation of medicines of this claſs is extremely quick, their effects are obvious and unequivocal, and the relief which they afford is very conſiderable: hence they were peculiarly adapted for the accompaniment of incantations. It is not improbable, however, that the term may have been originally adopted in a metaphorical ſenſe. A medicine operating thus quickly, and producing almoſt inſtantaneous relief, might be ſaid to operate *like a charm;* and it might therefore be figuratively, but quaintly denominated *carminative*. The word is ſcarcely to be found in the medical language of the preſent day.

The ſubſtances included under this denomination, are of an aromatic or gratefully ſtimulant nature; conſiſting chiefly of the eſſential oils of vegetables, either pure, or ſuſpended in water by diſtillation, or combined with volatile ſalts or other ſtimulants; of the leſs active forms of the æthers, or the dulcified ſpirits, as they were formerly called, &c. The ſtomach when greatly diſtended with wind, becomes unable to relieve itſelf (like the bladder, after a long retention of the urine), partly in conſequence of the weakened ſtate of the over-ſtretched fibres of its muſcular coat, and partly, perhaps, from a contraction of the *cardia*, or upper orifice. For, however difficult it may be to explain it, the fact is well known, that a loſs of power to act, and a morbidly increaſed or ſpaſmodic action, are both conſequences of the debility of the muſcular fibre. The mode of operation of the *carminative* medicines, therefore, on the contractile coats of the ſtomach, by which it is relieved from the diſtenſion of wind, conſiſts chiefly in exciting to a certain degree of action the diſtended and weakened muſcular coat, by which the accumulated *gas* is propelled through the upper orifice; but partly alſo in reſolving any ſlight ſpaſmodic contraction of that orifice, which may exiſt. For as debility produces, ſo ſtimulants counteract, both the diminiſhed and the morbidly great action of the muſcular ſtructure.

CARMINE is a beautiful red precipitate of the colouring matter of *Cochineal*, which ſee.

CARMINIANUM, in *Ancient Geography*, *Carmignano*, a place of Italy, near Aletium, over againſt Lupia, and before Tarentum, in Meſſapia.

CARMONA, in *Geography*, a town of Spain, in the province of Andaluſia; it was known to the ancients by the name of Carmo, placed in Bætica, to the ſouth of Ilipa, and north-eaſt of Hiſpalis, and eſteemed by Cæſar one of the ſtrongeſt towns of the country. Philip IV. in conſideration of a preſent of 40,000 ducats, gave it the title of city. It is built on a declivity, looking down upon a rich valley, which is bounded by diſtant hills, excepting only to the ſouth, where a wide opening gives a paſſage to the Guadalquivir. It contains 12,685 perſons, and includes 7 pariſh churches, with 5 convents for men, 2 for women, and 2 hoſpitals; and they reckon in this place more than 100 oil mills: about 20 miles N.E. from Seville, and 40 S.W. from Cordova. N. lat. 37° 24′. W. long. 5° 37′.

Carmona, a town of Italy, in Friuli, in the county of Goritz, ſeated on a mountain near the river Indri, and belonging to the houſe of Auſtria. N. lat. 46° 15′. E. long. 5° 37′.

CARMONA, in *Botany*, Boſc. Nouv. Dict. Cavanilles. Claſs and order, *pentandria digynia*.

Gen. Ch. *Cal.* permanent, with five acute ſegments. *Corol.* monopetalous: tube ſhort; border with five acute diviſions. *Stam.* five. *Piſt.* germ ſuperior, globular; ſtyles two: ſtigmas ſimple. *Peric.* drupe globular; nut with five cells and five ſeeds.

Sp. C. *heterophylla*, Cav. Pl. 438. A ſhrub. *Leaves* alternate, faſciculated on tubercles, oval, oblong, ſometimes entire, ſometimes three-toothed, dotted with white above, villous underneath, on very ſhort petioles. *Flowers* red, in axillary, villous racemes. A native of the Marianne iſlands. According to Ventenat, it is nearly allied to Ehretia.

CARMOYLE ROAD, in *Geography*, an anchorage in Belfaſt loch, on the north-eaſtern coaſt of Ireland, where large veſſels, which load or unload at that port, uſually lie.

CARMULLA, a town of Hindooſtan, in the ſoubah of Dowlatabad; 70 miles N. from Viſiapour, and 88 E. from Poonah. N. lat. 18° 40′. E long. 75° 22′.

CARMYLISSUS, in *Ancient Geography*, a town of Aſia Minor, in Lycia, ſituated in a ſmall valley, at the foot of mount Anticragus; mentioned by Strabo.

CARNA, in *Botany*, Rheed. Mal. 1. p. 107. tab. 59. See LAURUS *Caſſia*.

CARNA, in *Geography*, a town of Arabia Felix, according to Ptolemy and Strabo, the latter of whom ſays, that it was the largeſt town belonging to the Minoeans, a people who inhabited the coaſt of the Red Sea, and who were neighbours to the Sabæans.—Alſo, a town of Phœnicia, the "Carne" of Pliny.

CARNABADIUM, in the *Materia Medica* of the ancients, a name given to a drug frequently mentioned by the Greek and Arabian writers.

CARNABAT, in *Geography*, a town of European Turkey, in the province of Romania; 50 miles W. of Burgas.

CARNABORU, a town of Poland, in the palatinate of Red Ruſſia; 60 miles S. of Halicz.

CARNAC, or KARNAC, a village of Egypt, about $1\frac{1}{4}$ mile below Luxor (which ſee), conſiſting of miſerable cottages, which ſerve as a foil to the magnificence of the ſplendid ruins by which they are ſurrounded. Theſe comprehend obeliſks, ſome of which are very beautiful and well preſerved, rows of ſphinxes, and a number of termini, compoſed of baſaltes, with a dog or lion's head, of Egyptian ſculpture, which ſeemed to ſerve as avenues to ſome principal building; mutilated ſtatues; walls covered with hiſtorical engraving, which is a repreſentation of men, horſes, chariots, and battles; porticoes of great elevation; colonnades of immenſe ſize; and colours of aſtoniſhing brilliancy; granite and marble; and ſtones of prodigious dimenſions, ſupported by capitals, and forming the roof of magnificent buildings, &c. &c. Bruce ſuggeſts, that Luxor is Dioſpolis, and that Carnac, together with that place, conſtituted the "Jovis Civitas magna" of Ptolemy.

CARNÆ, or CARNAPÆ, in *Ancient Geography*, a people placed by Pliny in the European Sarmatia, near the Cimmerian Boſphorus.

CARNAL MANAZEL, in *Geography*, a town of Arabia; 40 miles E.S.E of Mecca.

CARNALIS, in *Ancient Geography*, a town of Aſia, placed by Ptolemy in Armenia Minor.

CARNALLOCH, or CAIRN LOUGH, in *Geography*, lies in the country of Antrim, Ireland, near the mouth of the ſmall river Glenevy, which falls into Glenarm bay; 2 miles N. of Glenarm, and 108 N. of Dublin.

CARNAMART, a river of the county of Galway, Ireland, which falls into the bay of Galway; it has ſeveral branches, one of which proceeds from Loughrea. This river is partly ſubterraneous, and it forms a turlogh; i.e. a ſpot which in winter appears as a lake, but in ſummer is dried up, and reckoned a good ſheep-walk.

CARNAPOLE, a factory on the Malabar coaſt of India, S.S.E. from Cochin.

CARNARIUM, a charnel-houſe, or repoſitory for the bones of the dead.

CARNASA, or CARSANA, in *Ancient Geography*, a town of India, on this ſide of the Ganges. Ptolemy.

CARNATIC, or CARNADA, in *Geography*, a country of Hindooſtan, lying along the coaſt of Coromandel, from cape Comorin, in N. lat. about 8° to about 16°. It is bounded on the north by the country of Golconda, on the eaſt by the bay of Bengal, and on the weſt by the Myſore, Dindigul, and Travencore. The dominions of the late Mahomed Ally, nabob of the Carnatic, and an ally of the Eaſt India company, commence on the ſouth of the Guntoor Circar, called alſo Mortizanagur and Condavir, and extend along the whole coaſt of Coromandel to cape Comorin; including Tanjore, Marawar, Tritchinopoly, Madura, and Tenivelly, all being appendages of the Carnatic. Under this deſcription, the Carnatic is not leſs than 570 Britiſh miles in length from north to ſouth, but no where more than 120 wide, and commonly no more than 75. "Such a long narrow tract of country," ſays major Rennell, "bordered by an active and powerful enemy, whoſe territories are, moreover, of a compact form, and his force more readily collected, muſt always be ſubject to have its diſtant provinces cut off from its aſſiſtance; or, if it divides its force, for their ſeparate defence, the ſafety of the whole will be endangered." The Carnatic, ſays this ingenious geographer, anciently comprized all that part of the peninſula that lies ſouth of the Gondegama and Toombuddra rivers, from the coaſt of Coromandel eaſtward to the Gaut mountains weſtward, and divided into *Balla-gaut* (which ſee), and *Payen-gaut*; the former being the weſtern part, and the latter the eaſtern part, or the Carnatic, according to its preſent definition. The revenue of the nabob is ſtated at about a million and a half ſterling per annum; out of which he was accuſtomed to pay a ſubſidy of 160,000l. per annum, to the Eaſt India company, towards the expence of their military eſtabliſhment. The evils attendant on the improvident conduct of the nabob have been ſeverely felt in paſt times, and meaſures have been adopted for guarding againſt them in future. This nabob has been one of the moſt ancient, and was ſuppoſed to be one of the moſt faithful, allies of the Britiſh nation in India: and Mahomed Ally is ſaid to have been eſtabliſhed in the government of Arcot (the capital of the Carnatic), and its dependencies, chiefly by the active co-operation of the Britiſh power in India. During the war, in 1780, a combination was formed againſt the Carnatic, between the French and the famous Hyder Ally, and his ſucceſſor Tippoo Sultan; and they had made ſome progreſs towards the conqueſt of it, till they were ſtopped by the interpoſition of Great Britain. In conſequence of this event, it became neceſſary that an adequate military eſtabliſhment ſhould be maintained by Great Britain for the defence of that country; and, in 1787, a regular contract was ſettled to that effect; the nabob Mahomed Ally agreeing to pay an annual ſubſidy for the ſupport of the troops, amounting to 15 lacks of pagodas. After the war, in

1792, between Great Britain and the late Tippoo Sultan, it was repreſented to the marquis Cornwallis, that the nabob was unable to diſcharge theſe pecuniary engagements, and an indulgent modification of that treaty was framed, which reduced the ſubſidy to nine lacks of pagodas. In both treaties, however, it was ſtipulated, that the nabob ſhould contract no alliances, nor enter into correſpondence with any European or other power, without the knowledge and concurrence of the Britiſh government. Upon the death of Mahomed Ally, in 1793, he was ſucceeded by his eldeſt ſon Omdat ul Omrah. The ſecond ſon of the nabob, viz. Azum ul Omrah, whoſe fate is unknown to us, left behind him a ſon Azeem ul Dowlah, who was kept a priſoner in the palace of the nabob at Chepauk, till the death of his uncle, the late nabob. The nabob Omdat ul Omrah profeſſed that he ſucceeded to the poſſeſſion of the territories of his father under all the obligations of the treaties of 1787 and 1792, and a reciprocal friendſhip ſubſiſted, for ſome time, between him and the Engliſh company. Nevertheleſs, after the fall of Seringapatam, in 1799, the original records of Tippoo Sultan, as well as his official correſpondence, fell into the hands of the Britiſh government; and it was diſcovered, that the nabobs Mahomed Ally and his ſucceſſor, Omdat ul Omrah, had carried on with Tippoo Sultan a correſpondence, inconſiſtent with, and tending to the ſubverſion of, the alliance between the nabob of the Carnatic and the India company, and incompatible with the ſecurity of the Britiſh power in the peninſula of India. Hence it was concluded, that theſe princes had placed themſelves in the ſituation of enemies to Great Britain. As the nabob approached his end, inſtructions, dated the 5th and 6th of July, 1801, were iſſued by the government of the Eaſt India company, and a party of troops was ſtationed at the palace of Chepauk, for the purpoſe of carrying them into effect. On the death of the nabob, an attempt was made to adjuſt the affairs of the Carnatic, under the direction of lord Clive, governor of Madras. In the mean while Omdat ul Omrah, the nabob, died; and the Britiſh agents were informed that he had appointed his reputed ſon, Taje ul Omrah, commonly called Ally Huſſein, then about the age of 18, to be his ſole heir. In the courſe of the negociation that enſued, it was alleged, on the part of the Britiſh agents, that the only adequate ſecurity for the rights and intereſts of the Britiſh government in the Carnatic was the entire and excluſive adminiſtration of the civil and military authority. To this propoſition it was objected, that if this was to be the baſis of the arrangement, the ſtation of nabob of the Carnatic muſt be annihilated, and all the power transferred into the hands of the company. On the other hand, it was replied, that the condition now propoſed actually exiſted in the treaties of 1787 and 1792; and that the object of the propoſed arrangement was to ſecure the rank, dignity, and ſplendour of the nabobs of the Carnatic, inſtead of exerciſing the full rights acquired by the Britiſh government. Ally Huſſein, with the advice of his two khans, expreſſed his diſapprobation of the terms propoſed; and when the treaty with him was brought to this termination, it was reſolved, if poſſible, to open a negociation with the prince Azeem ul Dowlah; the conſequence of which was, that the prince affixed his ſignature to a Perſian draft of the propoſed treaty, on the baſis of that rejected by Ally Huſſein, binding himſelf to execute a more formal treaty, at the period of his intended inſtallation; and on the following day he was formally introduced to the governor of Madras, as the future nabob of the Carnatic, and conducted to the palace appointed for his reſidence. Thus the whole ſubſtantial power of the Carnatic was veſted in the hands of the India company, and a proclamation was iſſued expreſſing the nature and terms of the arrangement. The treaty bears date the 31ſt of July, 1801, and enjoins that a permanent ſyſtem for the collection of the revenue, and for the adminiſtration of civil and criminal judicature, under the ſole and undivided authority of the honourable company, exerciſed by the governor in council of Fort George, ſhall be eſtabliſhed throughout every village, [illegible], and province, of the entire territories of the Carnatic.

The Britiſh poſſeſſions in the Carnatic are confined, chiefly, to the tract called the "Jaghire," which extends along the coaſt, about 108 Britiſh miles, and 47 inland, in the wideſt part. Its revenue is reckoned 150,000l. Beſides the Jaghire, there are lands dependent on Cuddalore; but the amount is not conſiderable. The whole amount of the land revenue dependent on Madras, including the circars, is ſtated at 725,000l. per annum. The principal towns of the Carnatic are Arcot, the capital, Madras, Ongole, Pondicherry, Cuddalore, Tanjore, Tritchinopoly, Madura, and Tenivelly. The principal rivers are the Pennar, the Paliſar, and the Cauvery. The Carnatic abounds with forts and fortreſſes of various kinds. Carnatic-gur and Doby-gur are two noted fortreſſes on the ridge of hills on the weſt of Arnee.

CARNATION, in *Botany*. See DIANTHUS *caryophyllus*.

CARNATION, *Spaniſh*. See CÆSALPINIA *veſicaria*.

CARNATION-*graſs*, in *Agriculture*, a term applied to the finer ſorts of graſſes, probably from their having this kind of colour in their flowers.

CARNATION-*tree*. See CACALIA *kleinia*.

CARNATION, among *Dyers*, red roſe-colour, for which take liquor of wheat-bran a ſufficient quantity, alum three pounds, tartar two ounces; boil them, and enter twenty yards of broad cloth; after it has boiled three hours, cool and waſh it: take freſh clear bran-liquor a ſufficient quantity, and madder five pounds; boil and ſadden according to art.

The Bow-dyers know that the ſolution of jupiter, or delved tin, being put in a kettle to the alum and tartar, in another proceſs, makes the cloth, &c. attract the colour into it, ſo that none of the cochineal is left, but the whole is abſorbed by the cloth.

CARNATION, *Fleſh-colour*, in *Painting*, is underſtood of all the parts of a picture in general, which repreſent fleſh; or thoſe parts of the human figure which are naked, and without drapery.

Titian and Corregio, in Italy, and Rubens and Van-Dyke in Flanders, excelled in carnations.

It may be here obſerved, that the word carnation is not properly uſed for any particular part of the perſon painted, but for the whole nudity of the piece. See COLOURING.

CARNATUS, in *Ancient Geography*, a river of Aſia Minor, in Cataonia.

CARNAWL, in *Geography*, a town of Hindooſtan, in the country of Sirhind; 7 miles N.W. of Delhi.

CARNCHUINAIG, a mountain of Scotland, near Kincardine, in the county of Roſs.

CARNE, in *Ancient Geography*, a town of Aſia, ſituated on the confines of Phœnicia and Syria, placed by Steph. Byz. in the former, and by Pliny in the latter. Strabo calls it Caranos, and makes it a ſea-port of the Aradians.—Alſo a town of Aſia Minor, in the Æolide. Steph. Byz.

CARNE, in *Geography*, a ſmall poſt town in the county of Donegal, province of Ulſter, Ireland, in the northern part of the peninſula of Iniſhowen; 133 Iriſh miles N.W. from Dublin, and about 18 N.W. from Londonderry. N. lat. 55° 16′. W. long. 7° 9′.

Carne, a fiſhing town, or rather village in the peninſula of the Mullet, county of Mayo, Ireland, not far from the iſthmus that joins it to the other part of the county. See Mullet. N. lat. 54° 14′. W. long. 9° 50′.

CARNEA, in *Ancient Geography*, a place of Paleſtine in Batanæa, north-eaſt of mount Galaad, and ſouth-eaſt of Tiberias.

CARNEADES, in *Biography*, an eminent Greek philoſopher, the founder as well as an illuſtrious ornament of the third or new academy, was a native of Cyrene in Africa, and born, according to the moſt probable ſuppoſition, in the 3d year of the 141ſt Olympiad, B. C. 214. He received his firſt inſtructions with regard to the art of reaſoning from Diogenes the ſtoic, and when he became a member of the academy, he attended the lectures of Egeſinus, and from him acquired the art of diſputing which had been introduced by Arceſilaus. As the ſucceſſor of Egeſinus in the chair of the academy, he contributed to reſtore its declining reputation. Having occaſion to viſit Rome, in company with Diogenes the ſtoic and Critolaus the peripatetic, on an embaſſy for obtaining the mitigation of a fine inflicted upon the Athenians, by the Sicyonians under the authority of the Romans, for having laid waſte Oropus, a town of Bœotia, Carneades and his aſſociates exhibited many ſpecimens of Grecian learning and eloquence, not before known in that city. Carneades excelled in the vehement and rapid, Critolaus in the correct and elegant, and Diogenes in the ſimple and modeſt kind of eloquence. The former having one day harangued, with great variety of thought and copiouſneſs of diction, in praiſe of juſtice, before Galba and Cato the cenſor, undertook next day, with a view of eſtabliſhing his doctrine of the uncertainty of human knowledge, to refute all his former arguments. He attracted the attention and excited the admiration of his auditors by the ſubtlety of his reaſoning, and the fluency of his language; and the popularity which he acquired alarmed Cato to ſuch a degree that he perſuaded the ſenate to haſten the return of theſe philoſophers to their own ſchools, leſt the Roman youth ſhould loſe their military character in purſuit of Grecian learning. In his own ſchool the reputation of Carneades, both as an orator and a philoſopher, was ſo great, that other philoſophers, when they had diſmiſſed their ſcholars, came to hear him. So intent and indefatigable was his application to ſtudy, that at his meals he often forgot to take the food that was ſet before him. Whilſt he did juſtice to the merit of Chryſippus the ſtoic, he ſtrenuouſly oppoſed him; and he uſed to ſay, that if there were no Chryſippus, there would be no Carneades, thus acknowledging he owed a conſiderable degree of his reputation as a diſputant to the abilities of his opponent. He poſſeſſed extraordinary powers of voice, and was accuſtomed to ſpeak ſo loud, that he needed ſome ſtandard by which to regulate it; but his maſter told him that he had ſuch a meaſure or ſtandard in the number of his hearers. As he grew old, he was greatly diſturbed by the apprehenſions of dying, and frequently lamented, that the ſame nature which had compoſed the human frame could diſſolve it. After a life prolonged to very advanced age, he cloſed it in his 85th, as ſome ſay, or according to Cicero and Valerius Maximus, in his 90th year. For an account of the doctrine of the new academy, as it was eſpouſed and taught by Carneades, ſee Academy. Although he oppoſed the doctrine of the Stoics concerning the gods, he did it, as Cicero ſays, not with a view to deſtroy the belief of ſuperior powers, but merely to prove, that their theological ſyſtem was unſatisfactory. Avowing likewiſe his repugnance to their opinion, concerning fate, he aſſumed, on the ground of experience, the exiſtence of a ſelf-determining power in man, and hence inferred, that all things did not happen, as the Stoics maintained, in a neceſſary ſeries of cauſes and effects, and conſequently, that it is impoſſible for the gods to predict events dependent on the will of man. As the foundation of morals, he taught, that the ultimate end of life is the enjoyment of thoſe things, towards which we are directed by the principles of nature. Brucker's Hiſt. Phil. by Enfield, vol i. Gen. Dict.

CARNEDDE, in *Britiſh Antiquity*, denote heaps of ſtone ſuppoſed to be Druidical remains, and thrown together on occaſion of confirming and commemorating a covenant. Gen. xxxi. 46. They are very common in the iſle of Angleſey; and were alſo uſed as ſepulchral monuments, in the manner of *tumuli:* for Mr. Rowland found a curious urn in one of theſe carnedde. Whence it may be inferred that the Britons had the cuſtom of throwing ſtones on the deceaſed. From this cuſtom is derived the Welſh proverb, *Karn ar dy ben*, ill betide thee. Rowland's Mona Antiqua Reſtaurata. See Barrow and Burial.

CARNEIA, in *Antiquity*, a feſtival in honour of Apollo, ſurnamed Carneus, held in moſt cities of Greece, but eſpecially at Sparta, where it was firſt inſtituted in the 26th olympiad.

The reaſon of the name, as well as the occaſion of the inſtitution, is controverted. It laſted nine days, beginning on the 13th of the month Carneus or Carnius, which ſee. The ceremonies were an imitation of the method of living and diſcipline uſed in camps.

CARNEL. The building of ſhips firſt with their timber and beams, and after bringing on their planks, is called *carnel-work*, to diſtinguiſh it from clinch-work.

Veſſels alſo which go with mizzen-ſails inſtead of mainſails, are by ſome called *carnels*.

CARNELIAN. See Chalcedony.

CARNERA, in *Geography*, one of the ſmaller Cape Verd iſlands, which is little more than a rock.

CARNERO, a cape in the South Sea near Santa Maria, on the coaſt of Peru. S. lat. 1° 35′. W. long. 77° 20′.

CARNESS, a cape of Scotland, on the north coaſt of the iſland of Pomona; 2 miles N. of Kirkwall.

CARNESVILLE, the chief town of Franklin county, in the ſtate of Georgia, America, 100 miles N.W. of Auguſta; containing a court-houſe and about 20 dwelling houſes.

CARNEW, a ſmall town of the county of Wicklow, Ireland, near the county of Wexford. It makes a deſpicable appearance, but ſome linen and much coarſe woollens are manufactured in the neighbourhood of it, and its fairs are much frequented. It is 44 miles South from Dublin. N. lat. 52° 42′. W. long. 6° 31′.

CARNEY, a diſeaſe in horſes, wherein their mouths become ſo furred that they cannot eat.

CARNI, in *Ancient Geography*, a people who were ſeparated from Norica by the Carnic or Julian Alps. According to Ptolemy they had three cities, "Forum Julium," "Concordia," and "Aquileia." Hence it appears that they occupied a part of the ſtate of Venice. Oroſius ſays that they were a Gauliſh nation; and he concurs with the epitome of Livy in ſaying that they were vanquiſhed in the year of Rome 635, by the conſul Quintus Martius Rex.

CARNIA, a name given to the territory at the bottom of the Adriatic gulf, inhabited by the Carni. It correſponded to the Venetian Friuli and a ſmallpart of Carniola. —Alſo, a town of Aſia Minor, in Ionia. Steph. Byz.

CARNICOBAR, in *Geography*, the northernmoſt iſland of that cluſter in the bay of Bengal, called *Nicobars*. It is low, of a round figure, about 40 miles in circumference, and at a diſtance appears as if it were entirely covered with trees; though there are upon it ſeveral well cleared and delightful ſpots. The ſoil is a black kind of clay, and marſhy; producing, however, abundantly and with little care, moſt of the tropical fruits, ſuch as pine-apples, plantains, papayas, cocoa-nuts, and areca-nuts; beſides excellent yams, and a root called "cachu." The only quadrupeds upon the iſland are hogs, dogs, large rats, and a large animal of the lizard kind, called by the natives "tolonqui." Of poultry they have only ſome few hens. The ſnakes, of various kinds, are numerous, and their bites are frequently fatal to the inhabitants. The timber is plentiful, and of various ſorts; ſome of it is very large, and affords excellent materials for building or repairing ſhips. The natives are low in ſtature, but well made and ſurpriſingly active and ſtrong; they are copper-coloured, and their features have a caſt of the Malay. The women, in particular, are very ugly. The men cut their hair ſhort, and the women ſhave their heads, and wear no covering but a ſhort petticoat, made of a ſort of ruſh or dry graſs, which reaches half-way down the thigh. The men have only narrow ſtrips of cloth tied tight about their middle. The ears of perſons of both ſexes are pierced when young, and by ſqueezing into the holes large plugs of wood, or hanging heavy weights of ſhells, they render them wide and diſagreeable in their appearance. They have enormous appetites, and are addicted to exceſſive drinking of arrack; and much of their time is ſpent in feaſting and dancing. Their favourite food is pork, eaten almoſt raw, and their hogs, fed on the cocoa-nut and ſea-water, are remarkably fat; but they have plenty of ſmall ſea-fiſh, which they ſtrike with their lances. Their common drink is cocoa-nut milk, and a liquor called "ſoura," which oozes from the cocoa-nut tree after cutting off the young ſprouts or flowers. This is ſuffered to ferment, and thus becomes intoxicating. Whilſt the old people ſmoke tobacco and drink ſoura, the young ſing and dance. Their only muſical inſtrument is a hollow bamboo, about 2½ feet long, and three inches in diameter; along the outſide of which is ſtretched from end to end a ſingle ſtring made of the threads of a ſplit cane, and the place under the ſtring is hollowed a little, to prevent it from touching. This inſtrument is played upon in the ſame manner as a guitar; it produces but few notes, and is generally accompanied with the voice. Their houſes are commonly built upon the beach, and form villages, each of which conſiſts of 15 or 20; and each houſe contains a family of 20 perſons and upwards. Theſe habitations are raiſed upon wooden pillars, about 10 feet from the ground; their form is round, and having no windows, they appear like bee-hives covered with thatch. They enter them below by a trap-door and with the help of a ladder, which they draw up at night; thus, and alſo by bending round the pillars a ſmooth kind of leaf, they ſecure their houſes from being infeſted with ſnakes and rats. The flooring is made of thin ſtrips of bamboo, which are laid at ſuch diſtances as to admit light and air. The art of making cloth is unknown to the inhabitants of this iſland; but they procure this as well as hatchets and hanger-blades, in exchange for their cocoa-nuts, which are reckoned the beſt in this part of India. They have no money, nor do they allow any value to the coin of other countries, except for the purpoſe of ornaments; and accordingly the young women ſometimes hang ſtrings of dollars about their necks. The cloth they purchaſe, beyond that which they want for their own conſumption, is intended for the Choury market. *Choury* is a ſmall iſland to the ſouth of theirs, to which a large fleet of their boats ſails every year about the month of November, to exchange cloth for canoes, which they cannot make at home. This voyage is performed by means of the ſun and ſtars; for they have not any knowledge of the compaſs. In their diſpoſition there are two remarkable qualities; viz. an entire neglect of compliment and ceremony, and an averſion to diſhoneſty. From their frequent intercourſe with ſtrangers they have in general acquired the barbarous language of the Portugueſe, ſo common over India; their own tongue has a ſound quite different from moſt others, their words being pronounced with a kind of ſtop, or catch in the throat, at every ſyllable. They have no notion of a God; but they firmly believe in a devil, and worſhip him from fear. When they are threatened with a ſtorm, they imagine, that the devil intends them a viſit, upon which they perform many ſuperſtitious ceremonies. When a man dies, his whole live ſtock, cloth, hatchets, fiſhing lances, and every moveable thing in his poſſeſſion, are buried with him; and his death is lamented by the whole village. His wife, according to cuſtom, muſt conſent to have a joint cut off from one of her fingers; and if ſhe refuſes, ſhe muſt ſubmit to have a deep notch cut in one of the pillars of her houſe. Polygamy is not known in this iſland; and they puniſh adultery, by cutting from the man's offending member a piece of the foreſkin, proportioned to the frequency or enormity of the crime. Among theſe people there ſeems to ſubſiſt a perfect equality. Reſpect is paid to age, but they have no appearance of the exerciſe of authority one over another. Their ſociety ſeems to be cemented by mutual obligations continually conferred and received. N. lat. 9° 11′. E. long. 93° 18′. Aſiatic Reſearches, vol. ii.

CARNICULA is uſed by ſome for a caruncle, more particularly for that fleſhy ſubſtance which inveſts the teeth.

CARNID, in *Natural Hiſtory*, a name given by Averrhoes to what is called ZARNICH by more ancient writers.

CARNIERES, in *Geography*, a town of France, in the department of the North, and chief place of a canton, in the diſtrict of Cambray; the place contains 718, and the canton 14,110 inhabitants; the territory comprehends 122½ kiliometres, and 16 communes.

CARNIFEX, among the Romans, the common executioner. By reaſon of the odiouſneſs of his office, the carnifex was expreſsly prohibited by the laws from having his dwelling houſe within the city; but lived without the "Porta Metia," or "Eſquilina," near the place deſtined for the puniſhment of ſlaves, called "Seſtertium," where were erected croſſes and gibbets, and where alſo the bodies of ſlaves were burnt, or thrown out unburied. The carnifex, (according to ſome,) was anciently keeper of the priſon under the triumviri capitales, who had only the ſuperintendence, or care of it; hence, "tradere ad carnificem," to impriſon. In middle age writers carnifex alſo denotes a butcher.

Under our Daniſh kings, the carnifex was an officer of great dignity; being ranked with the archbiſhop of York, earl Goodwin, and the lord ſteward. Flor. Wigorn. ann. 1040. *Rex Hardicanutus Alfricum Ebor. Archiep. Goodwinum comitem, Edricum diſpenſatorem, Thrond ſuum* carnificem, *et alios magnæ dignitatis viros Londinum miſit.* Spelm. Gloſſ. p. 125.

CARNIFICATION, in *Surgery*, is the converſion of bone into fleſh; of which proceſs many examples are referred to, and deſcribed by medical writers: but in fact, this phenomenon conſiſts only in the abſorption of the phoſphate of lime, or oſſeous matter of a bone, leaving the fibrous ſubſtance, and conſequently producing a flexibility of the bone. This is not ſtrictly a tranſmutation of bone into fleſh, but merely a removal of one of the component parts of bone; viz. that which gives firmneſs and ſtability to the oſſeous ſyſtem. See Mollities *Oſſium*, and the article Bone.

CARNIOLA, *duchy of*, in *Geography*, a country of Auſtria, bounded on the north by Carinthia and Stiria, on the weſt by Friuli, the county of Gorz, and the Adriatic Sea, on the ſouth by part of Iſtria and the Adriatic, and on the eaſt by Dalmatia and Croatia. Its name "Krain," or "Crania," was probably derived from Carnia, for which the appellation Carniola was ſubſtituted, and uſed as early as the 8th century. This duchy, in its greateſt extent, meaſures about 120 miles from eaſt to weſt, and about 100 from north to ſouth. The country is moſtly mountainous; ſome of the mountains being naked, others clothed with wood, and many of them continually covered with ſnow. The principal of theſe mountains are the Caleberg, the Lobel, or Lybel, ſeparating Carniola from Carinthia, and affording from its ſummit a very fine proſpect, the Rum-berg, the Carſt, or Karſt, the Birnhaumer-wald, anciently "Alpes Juliæ," and "Alpes Carnicæ," (ſee Alps); alſo a high and woody mountain extending from the riſe of the Saue, through Carniola, into the Turkiſh dominions, and containing in its leaſt breadth three German miles, and the high mountain of Nanas, lying between Wipach and St. Veit. Among the mountains of this country there are many fruitful vallies and fields, which yield not only good paſturage, but excellent crops of corn, hemp, flax, and millet. It affords likewiſe good fruit for cyder and perry, cheſnuts, walnuts, olive trees, oranges, lemons, citrons, almonds, figs, &c. and vines, the grapes of which ſupply very good red and white wine. The country alſo breeds horned cattle and horſes in great plenty, and furniſhes all ſorts of fowl and veniſon, and alſo many kinds of fiſh. The mountains yield iron, lead, and copper. The Carniolian marble is reckoned beautiful. Carniola abounds with immenſe caves, and other natural curioſities. The chief rivers are the Saue, the Laybach, the Gurk, and the Culpa; and the principal inland lakes are the Feldeſſer and Wocheiner, and alſo Circkknitzer Sea. It has 21 cities, Laybach being the capital, 35 market-towns, 200 caſtles, 4000 villages, and other ſettlements, 38 convents, 134 pariſhes, 66,200 inhabited houſes, and 6275 uninhabited houſes, 75,788 families, 1504 clergy, 401 nobles, 2069 burghers and tradeſmen, and 48,600 peaſants. The common people, who are robuſt and hardy, are of Sclavonian extraction, but the nobility are, for the moſt part, German. Among the common inhabitants, occupying different parts of the country, there is a great difference of manners, dreſs, and language. The two principal languages are the Sclavonic or Windiſh, and the German. The Chriſtian doctrine was introduced into Carniola about the latter half of the 8th century; and the Lutheran doctrine was admitted in the 16th century; but the inhabitants are now principally Roman Catholics, beſides ſome members of the Greek church. The exports from Carniola are iron, ſteel, quickſilver, red and white wine, olive-oil, cattle, ſheep, cheeſe, linen, a kind of woollen ſtuff called "mahalan," Spaniſh leather, honey, ſhip-timber, and every kind of wood-work, ſuch as boxes, diſhes, trenchers, ſpoons, knives, &c. The Slavi, called alſo Winds, or Wends, took poſſeſſion of this country after the year 548. In the time of Charlemagne and his poſterity, it was governed by the dukes of Friuli, and afterwards by thoſe of Carinthia; but under Otto II. it became a peculiar margraviate, probably derived from Otto I. The ſovereignty of this duchy was afterwards conferred on Frederic II., duke of Auſtria and Stiria, and in 1231, the country raiſed itſelf into a duchy. Afterwards, Albrecht I. mortgaged it to the Carinthian duke Meinhard, but in 1335 it reverted again, together with Carinthia, to the houſe of Auſtria, to which it has been ever ſince united. Towards the maintenance of the military power of the houſe of Auſtria, Carniola contributes annually 363,171 florins, 56 kruitzers. This duchy is divided into Upper Carniola, which enjoys a wholeſome air and freſh ſprings, of which Laybach is the capital; Lower Carniola, containing many fruitful vallies and tracts, and yielding an excellent wine, called "marchevein," the chief town of which is Gurkfeld, or Kerſko; Middle Carniola, abounding with villages, though mountainous and deficient in water, the capital of which is Gottſchee; Inner Carniola, mountainous, yielding little corn, but furniſhing much good wine, the chief town of which is Tybein, or Duin; and Auſtrian Iſtria, very fertile in wine, oil, corn, and other articles of ſubſiſtence, and conſiſting of the county of Mitterburg, the ſeigniory of Caſtua, the town of St. Veit, the territory of Trieſt, of Idria, that of Tulmino, the county of Gorz, that of Gradiſca, and the territory of Aquileja.

CARNION, in *Ancient Geography*, a ſtrong city of Gilead, in Paleſtine, belonging to the half tribe of Manaſſeh, on the other ſide of Jordan. It was to this city that Timotheus ſent all the women, children, and luggage, when Judas Maccabeus was in full march againſt him. Hither alſo, after the defeat of his army, and the loſs of 30,000 men, thoſe who eſcaped the ſlaughter, being cloſely purſued by the victorious army of Judas, retreated, and many of them ſought refuge in the temple of Atargatis. Judas, however, burnt the temple and thoſe who were ſheltered in it; and then ſetting fire to the reſt of the city, they all periſhed likewiſe, either by the flames, or by his ſword, to the number of 25,000. 2 Macab. xii.

Carnion, or Carnium, a town of Peloponneſus, in Laconia. Polybius.—Alſo, the name of a ſmall ſtream on the ſouthern part of Arcadia, which ran from the ſouth-eaſt to the north-weſt, and diſcharged itſelf into the river Gatheatas.

CARNITZ, in *Geography*, a town of Germany, in the circle of Upper Saxony, and duchy of Pomerania; 5 miles N. of Greiffenberg.

CARNIVAL, or Carnaval, a ſeaſon of mirth and rejoicing, obſerved with great ſolemnity by the Italians, and particularly at Venice.

The word is formed of the Italian *carnavale;* which Du Cange derives from *carn-a val*, becauſe the *fleſh* is then put into the *pot*, in order to make amends for the ſeaſon of abſtinence enſuing. Accordingly, in the corrupt Latin, he obſerves, it was called *carnelevamen*, and *carniſprivium;* as the Spaniards ſtill denominate it, *carnes tollendas*.

The carnival time commences from Twelfth-day, and holds till Lent. Feaſts, balls, operas, maſquerades, ridottos, concerts of muſic, intrigues, marriages, &c. are chiefly in carnival time. During the carnaval, St. Mark's place is the grand ſcene of riot and folly, where mountebanks and various other impoſtors are allowed to erect their ſtages, and to practiſe on the credulity of the crowds who aſſemble round them. See Venice.

CARNIVOROUS, in *Zoology*, an epithet generally applied to animals of every deſcription that ſubſiſt for the moſt part, or entirely, on animal food. In a more limited ſenſe we underſtand by carnivorous animals, thoſe only of a ſavage and voracious nature, aſſimilating in our ideas ſome inſtinctive ferocity of character in the manners of thoſe creatures when ſeeking and attacking their prey, as well as actually feeding on fleſh. We naturally conſider, for this reaſon, among the principal carnivorous animals the lion, the tiger, and the wolf; or among birds, the eagle, and the kite, with a hoſt of other rapacious creatures, upon which nature has beſtowed pre-eminent advantages of courage, ſtrength, and arms to aid them in ſeizing upon, and tearing into pieces, thoſe animals on which they feed: they have either formidable canine teeth, or fangs; claws, or talons; the quadrupeds poſſeſſing both, and the birds the latter: fiſhes with very few exceptions are carnivorous, but their only offenſive weapons are the teeth, or in ſome ſpecies the ſpines and prickles diſpoſed on various parts of the body. Quadrupeds that ſubſiſt both on fleſh and vegetables are more or leſs deficient with reſpect to thoſe characters by which carnivorous quadrupeds are known; and thoſe ſtill more ſo that ſubſiſt entirely on roots, barks, fruits, graſs, or other vegetables: the brutæ have no cutting teeth either in the upper or lower jaw; the pecoræ have them only in the lower jaw; and the front teeth of the belluæ are obtuſe:—the food of thoſe animals is vegetables.

Deſmareſt, and other modern French writers on zoology, form a diſtinct ſubdiviſion of their carnaſſiers, (an order of quadrupeds comprehending moſt of the Linnæan feræ,) under the title of carnivores. This ſubdiviſion compriſes the three families of martins, cats, and dogs, in the following order. The *firſt family*, **Mustelins**, or martes, contains five genera; namely, ſurikate, mangouſte, marte, mouffette, and loutre. Surikate is a genus formed only of a ſolitary ſpecies, viverra tetradactyla of Linnæus; the mangouſte conſiſts of Linnæan viverræ, and marte of animals ſeparated from both of the Linnæan genera, viverra and muſtela. Mouffette conſiſts of viverra mephitis, Linn. and other Linnæan ſpecies of viverra; and the laſt genus, loutre, compriſes part of the muſtelæ of Linn., and lutra of Erxleben. The *ſecond family* are **Felins**, comprehending the two genera, chat (*felis*, Linn.) and civette, (*viverra*, Linn.) The *third family*, **Cynosiens**, contain three genera, hyène, (*canis*, Linn.) fennec, conſiſting only of one ſpecies, (*canis cerdo*, Linn.) and chien, (*canis* of Linnæus,) including the common dog, *familiaris*, wolf, *lupus*, and fox, *vulpes*.

Carnivorous animals are characteriſed both by their internal organization and their capacity and inclination for the deſtruction of their prey; their teeth are ſharp and pointed, even though ſituated in the back part of the mouth; and theſe teeth, denominated *canine*, are ſo long in moſt of the beaſts of prey, that they paſs a conſiderable way beyond each other when the jaws are cloſed. The diſtribution of the enamel which is confined to the ſuperficies of the teeth, renders them extremely hard, and this circumſtance, joined to an extraordinary bulk of thoſe muſcles, employed in raiſing the lower jaw, give to carnivorous quadrupeds the power of breaking the ſtrongeſt bones. The rapacious birds are diſtinguiſhed by a ſharp hard bill, furniſhed on each ſide with a pointed proceſs, by which they are enabled to tear aſunder the parts of the animals they feed upon.

As the digeſtion of animal ſubſtances is accompliſhed in a ſhort time, the ſtomach of the carnivorous tribes has a ſimple figure without any proceſſes or ſeparations of its cavity to retain its contents, or to delay their paſſage into the inteſtines; and as animal food furniſhes but little excrement, the inteſtinal canal is ſhort, and either totally unprovided with thoſe dilatations, which are ſo remarkable in vegetable eaters, or poſſeſſes them only in a ſlight degree.

Carnivorous animals are further diſtinguiſhed by the extraordinary ſtrength of their members, which are commonly furniſhed with ſharp claws; theſe are ſo contrived, both in the beaſts of prey, and the accipitrine birds, that they turn inwards by the flexion of the limb, or the action of ſeizing any thing, and are retracted by the extenſion of the toes; thus giving facility and certainty to the capture and retention of fugitive animals.

The ſenſes of *viſion* and *ſmell* are particularly acute in the carnivorous tribes, as it is by means of them that they diſcover or ſeek out their prey.

Carnivorous animals are uſually cruel and treacherous in their diſpoſitions; they are even unſocial with reſpect to their own ſpecies; and hence it is that their numbers are ſo few in compariſon to that of the graminivorous kind: if it were not for this wiſe ordinance of nature, the defenceleſs orders of animals would ſoon be devoured, and the carnivorous would become the prey of each other.

It is a diſpute among naturaliſts, whether or not man be naturally carnivorous? Some contend that the fruits of the earth were intended as his ſole food; and that it was neceſſity in ſome places, and luxury in others, that firſt prompted him to feed upon his fellow-animals. Pythagoras and his followers looked on it as a great impiety; and ſtrictly abſtained from all fleſh, from the notion of a metempſychoſis; and their ſucceſſors, the Bramins, continue the ſame to this day. The conſideration Gaſſendus chiefly inſiſts on, why man ſhould not be carnivorous, is the ſtructure and conformation of our teeth; moſt of them being either inciſores or molitores; not ſuch as carnivorous animals are furniſhed with, proper to tear fleſh; except the four *canini:* as if nature had rather prepared us for cutting herbs, roots, &c. than for eating meat. To which may be added, that when we do feed on fleſh, it is not without a preparatory coction, by boiling, roaſting, &c.

To theſe arguments, Dr. Wallis joins another; which is, that all quadrupeds which feed on herbs or plants have a long colon, with a cœcum at the upper end of it, or ſomewhat equivalent, which conveys the food, by a long and large progreſs, from the ſtomach downwards, in order to its ſlower paſſage and longer ſtay in the inteſtines. In man, the cœcum is very viſible: a ſtrong preſumption that nature, which is ſtill conſiſtent with herſelf, did not intend him for a carnivorous animal.

To the arguments uſed by Dr. Wallis and others, to prove that man is not naturally carnivorous, Dr. Tyſon anſwers, that if man had been deſigned by nature not to be carnivorous, there would doubtleſs have been found ſomewhere on the globe, people who do not feed on fleſh; and as hiſtory ſeems not to furniſh any inſtance of this kind, may we not ſay, that what is done univerſally by the whole ſpecies, is natural? For what the Pythagoreans did in abſtaining from fleſh, was on the principle of a tranſmigration, a miſtake in their philoſophy, not a law of nature: and though in ſome countries men feed more ſparingly on fleſh than in others, this is owing to their own choice, or from religious prejudices. He adds, that carnivorous animals are not always without a colon and *cœcum:* nor are all animals carnivorous which have thoſe parts; but that the *Sarigue*, or *opoſſum*, for inſtance, has both a colon and a cœcum, yet feeds on poultry, and other fleſh; whereas the hedge-hog has neither colon nor cœcum, and therefore ought to be carnivorous, yet it feeds principally on vegetables: add, that hogs, which have both, will feed on fleſh greedily enough when they can get it; and that rats and mice, which have large cœca, feed on bacon, as well as bread and cheeſe.

And, from the multitude of carnivorous animals which want thoſe parts, and of non-carnivorous, which have one or both, no ſafe concluſion can be drawn; ſince we might as well argue, that becauſe the neat-kind, ſtag-kind, goat-kind, and ſheep-kind, which live on herbage, have four ſtomachs, therefore all thoſe which have not four ſtomachs were not deſigned by nature to be graminivorous; whereas the horſe-kind and hare-kind have but one ſtomach, yet feed on graſs like the former; add, that in many animals which live on the ſame ſort of food, the ſtructure of the ſtomach is found very different; and that in others which live on different foods, ex. gr. on fleſh, on fruits, on graſs, &c. the ſtomachs are found ſo like, that it is difficult to aſſign any difference between them: and if we cannot make a judgment what food is moſt natural to an animal from the ſtructure of its ſtomach, which is the part moſt concerned in digeſting it, much leſs can we judge from the colon or cœcum, which are parts remote from the ſtomach, and ſeem rather as a cloaca for the reception of a fæces, than of uſe for digeſting or diſtributing the food.

In this, however, as in moſt other controverſies, truth lies between the two extremes; there is an obvious connexion between the conformation of the teeth, ſtomach, and inteſtines, and the nature of the food upon which an animal ſubſiſts: and according to the rules laid down by comparative anatomiſts on this ſubject, man was deſigned to uſe a mixed food in common; but if circumſtances required it, his organs were adapted to digeſt either animal or vegetable ſubſtances. His teeth are neither calculated for grinding coarſe vegetable food, nor for tearing the fleſh, or breaking the bones of animals: they are only fitted for maſticating ſuch matter when divided by machinery, or prepared by the operation of heat, in the ſeveral proceſſes of cooking.

The ſtomach of man is not very capacious; he does not need a reſervoir, even when ſubſiſting excluſively upon vegetables, as his invention always furniſhes him with the means of extracting the more nutritive parts; and, on the other hand, his ſtomach is formed to retain its contents for ſome time: if it were otherwiſe conſtructed, it would only be qualified for the concoction of animal matter.

Further, his inteſtines, with reſpect to length and capacity, hold a middle place between thoſe of graminivorous and carnivorous animals, or rather more like the latter, on account of the degree of preparation to which we ſubmit vegetable ſubſtances, previous to our eating them, in order to get rid of their indigeſtible parts.

Theſe obſervations are conſiſtent with daily obſervation and experience. The lower claſſes of people in almoſt all civilized nations live chiefly upon vegetable diet, and yet no rank in ſociety poſſeſſes more bodily ſtrength; and, on the other hand, the inhabitants of thoſe countries in which no ſteps have been taken to cultivate the ſoil, ſubſiſt almoſt entirely upon the beaſts they hunt down, or the fiſh their ſeas or rivers afford.

Man, therefore, in different circumſtances, and in different ſtates of ſociety, may be either *graminivorous*, *carnivorous*, or *omnivorous*.

CARNIUS, in *Chronology*, the Syracuſian name for the Athenian month METAGITNION; which was the ſecond of their year, and anſwered to the latter part of our July and beginning of Auguſt.

CARNO, in *Geography*, a river of North Wales, which runs into the Severn, in Montgomeryſhire.

CARNOET, or Carnet, a town of France, in the department of the north coaſt, and diſtrict of Guingamp, containing about 1100 inhabitants; 6 leagues S.W. from Guingamp.

CARNONACÆ, in *Ancient Geography*, a people of the north-weſtern part of Ancient Britain, placed by Ptolemy between the Creones and the Careni, and occupying, according to Baxter, that part of Roſſe which is called Aſſenſhire.

CARNOSA *Membrana*, } in *Anatomy*; ſee Panniculus
CARNOSUS *Panniculus*, } *Carnoſus*, and Membrane.

CARNOSITY, in *Surgery*, is a term uſed by former practitioners to denote a fleſhy excreſcence or tubercle, ſuppoſed to be a frequent cauſe of obſtruction in the urinary canal; but which is now generally believed to conſiſt of a ſimple conſtriction in the urethra. See Bougies, Caruncle, and Stricture.

Admitting, however, that ſuch carnoſities or caruncles do now and then exiſt in the urethra, they will require the ſame plan of treatment as ſtrictures, properly ſo called; ſo that no conſiderable error of a practical nature is likely to enſue from retaining the old opinion. Almoſt the only remedy we poſſeſs, in either caſe, is the diligent uſe of Bougies.

CARNOSUM *folium*, in *Botany*. See Leaf.

CARNSORE Point, in *Geography*, the S.E. point of Ireland, in the county of Wexford, and on the coaſt of St. George's channel, a little to the weſtward of which point is a cluſter of ſmall iſlands called the Saltees. N. lat. 52° 11'. W. long. 6° 20'.

CARNTOGHER Mountains, a large mountainous tract in the counties of Tyrone and Londonderry, Ireland.

CARNUS, in *Ancient Geography*, a town of Arabia Felix, belonging to the Sabæans.—Alſo, a town of Pannonia, on the Danube, according to Ptolemy.

CARNUTÆ, or Carnutes, a people of Gaul, to whom Ptolemy aſſigns the cities of Autricum or Carnutes, (Chartres) and Cenabum or Genabum (Orleans.) The Carnutes were mentioned long before the time of Cæſar, as Livy reckons them among the Celtic nations which paſſed the Alps in order to eſtabliſh themſelves in Italy, in the time of the elder Tarquin. They are alſo called Carnuti or Carnuteni Fœderati, and by Plutarch Carnutini. Their territory was very conſiderable, ſince it extended from the Seine to the Loire. Among theſe people the Druids held their general aſſemblies.

CARNUTUM or Carnuntum, a town of the Upper Pannonia, ſeated on the Danube, according to Pliny and Velleius Paterculus: the Carnus of Ptolemy.

CARO, in *Anatomy*, &c. See Flesh.

Caro *muſculoſa quadrata*, in *Anatomy*, a muſcle ſo called by Fallopius and Spigelius, but more popularly PALMARIS *brevis*.

Caro, *Annibal*, in *Biography*, an Italian poet and diſtinguiſhed ſcholar, was born in 1507 at Civita Nuova, in the march of Ancona, and as his parents were poor, though reputable, he was under a neceſſity in his youth, of gaining a ſubſiſtence by being domeſtic tutor to the ſons of Luigi Gaddi at Florence, who, duly apprized of his talents, appointed him his ſecretary, and conferred on him ſome benefices. After the death of Gaddi, he was taken under the patronage of Pier-Luigi Farneſe, who employed him in various commiſſions of truſt, and particularly in a buſineſs of importance with the emperor Charles V. at Flanders in 1544. Incurring ſome danger by the tragical death of the duke Farneſe, he took refuge at Parma, where he was kindly received by the duke Ottavio Farneſe. He afterwards lived with cardinal Alexander Farneſe, in the capacity of his private ſecretary, and having been promoted by this liberal and powerful patron to ſeveral commanderies and benefices, he enjoyed his favour till his death in 1566. The life of Caro was chiefly devoted to purſuits of elegant literature. In his youth he compoſed ſome works of the light and humorous kind, and he employed himſelf in tranſlations from the Greek, and printed Italian verſions of Ariſtotle's rhetoric, two orations of Gregory Nazianzen, and one of St.

Cyprian. He alſo tranſlated the Paſtorals of Longus and Ariſtotle's Hiſtory of Animals which was left unfiniſhed. Patronized by the Farneſe family, he was enabled to collect a rich cabinet of medals, on which he wrote an extenſive treatiſe that was never printed. His familiar letters are eſteemed the moſt perfect models of eaſe and elegance in epiſtolary writing. His Italian poetry has been commended; and his canzonets and ſonnets have been particularly celebrated. One of theſe poetical pieces to the honour of the royal houſe of France, produced a literary diſpute of a very virulent and ſerious nature. By ſome ſevere critical cenſure paſſed upon it by Lodovico Caſtelvetro, a celebrated grammarian, Caro was ſo provoked, that he wrote a reply ſo infamouſly libellous as to fix an indelible ſtain on his memory, both as a man and a Chriſtian. Caſtelvetro was accuſed of procuring the aſſaſſination of a young friend of Caro, and Caro was ſuſpected of having uſed means for ſubjecting Caſtelvetro to the inquiſition which occaſioned his exile from his native country, and the hazard of his life. After the termination of this diſgraceful and dreadful quarrel, Caro retired to a ſmall villa at Freſcati, where he ſpent his latter days chiefly in a tranſlation of Virgil's Æneid into blank verſe, which has been highly applauded, and ranked among thoſe performances which do the greateſt honour to Italian literature. It was firſt publiſhed at Venice in 1581; one of the beſt editions is that of Paris, 2 vols. 8vo. 1765. The "Poems" of Caro were printed at Venice in 1584, 4to. His "Letters" were reprinted at Padua in 1749, 3 vols. 8vo. Tiraboſchi, Nouv. Dict. Hiſt.

Caro, *St., Hugo de.* See Concordance.

Caro, in *Geography*, a town of Italy in the duchy of Montferrat; 16 miles S. of Acqui.

CAROB Tree, in *Botany*. See Ceratonia *Siliqua*.

Carob is alſo a goldſmith's ſmall weight, amounting to the 24th part of a grain. It is alſo called *prime*.

CAROCEDO, in *Geography*, a town of Portugal, in the province of Tras os Montes; 6 miles S. of Outeiro.

CAROCHA, a name which the Spaniards and Portugueſe give to a kind of mitre made of paper or paſteboard, on which are painted flames of fire, and figures of demons, worn by thoſe who are condemned to death by the tribunal of the Inquisition. See Act *of faith*.

CAROENON, in *Antiquity*, καροινον, or *Carenum*, names given by the Greeks and Romans to wine boiled over a ſlow fire, till only a half, third, or fourth part remained, and then mixed with honey or ſpices. Wine thus improved acquired ſeveral other names, ſuch as *muſtum, mulſum, ſapa, defrutum*, &c. At this time the ſame operation is performed with reſpect to ſack, Spaniſh, Hungarian, and Italian wines. In Italy, new wine which has been thus boiled, is put into flaſks, and uſed for ſallad and ſauces. In Naples, it is called "muſto collo," but in Florence it ſtill retains the name of "ſapa," Plin. l. xxii. c. 2. Columella, de re ruſtica, l. xii. c. 20.

CAROLA, *Ital.* This *muſical* term in Boccaccio, is ſynonymous with *Ballata*, which the Cruſca Dictionary defines, *Canzone, che ſi canta ballando*, "a ſong which is ſung and danced at the ſame time." See Ballad. This is the ſenſe in which the word *Karole* is conſtantly uſed by Chaucer.

> Theſe folke of which I tell you ſo
> Upon a karole wentirn tho,
> A ladie karoled 'hem, that hight
> Gladneſſe the bliſsful and the light,
> Well could ſhe ſing and luſtily,
> None half ſo well and ſemely——
> And couthe enough for ſoche doing
> As longith unto karolling ——
> There mighteſt thou karollis ſene
> And folke' daunce and merry ben ——
> Ne code I nevir thennis go
> Whiles that I ſaw 'hem dauncin ſo——

CAROLATH, in *Geography*, a town and principality of Sileſia, in the circle of Glogau, on the Oder; 3 miles N.N.W. of Beuthen.

CAROLI, among ſome *Surgeons*, denote venereal puſtules on the penis; called alſo *caries pudendorum*.

CAROLINA, North, in *Geography*, one of the united ſtates of America, bounded on the N. by Virginia, on the E. by the Atlantic Ocean, on the S. by South Carolina and Georgia, and on the W. by the ſtate of Tenneſſee or Teneſſee. It lies between 33° 50′, and 36° 30′, N. lat. and between 76° 8′ and 83° 8′ W. long.; being about 450 miles in length from E. to W. and 180 in breadth; and it contains 52,500 ſquare miles, of which 3,346,000 acres are improved land. Its charter limits gave it a greater extent, as they included the ſtate of Tenneſſee as far as the river Miſſiſſippi, ſo that its length would be about 758 miles. This ſtate comprehends eight diſtricts, which are divided into three claſſes, viz. the eaſtern, containing Edenton, Newbern, and Wilmington; the middle, including Fayetteville, (which ſee), Hillſborough, and Halifax; and the weſtern, which are denominated Morgan and Saliſbury. The three eaſtern diſtricts lie on the ſea-coaſt, and extend from the Virginia line ſouthward to South Carolina. The five others cover the whole ſtate to the W. of the maritime diſtricts, and moſt of them extend quite acroſs the ſtate from N. to S. Theſe diſtricts are ſubdivided into 58 counties in the following manner:

| Diſtricts. | Counties. | Diſtricts. | Counties. |
|---|---|---|---|
| Edenton, 9 counties. | Chowan | Hillſborough, 9 counties. | Orange |
| | Churrituck | | Chatan |
| | Cambden | | Granville |
| | Paſquetank | | Johnſton |
| | Perquimins | | Caſwell |
| | Gates | | Samſon |
| | Hertford | | Wake |
| | Bertie | | Guilford |
| | Tyrrel | | Randolph |
| Wilmington, 8 counties. | New Hanover | Saliſbury, 8 counties. | Rowan |
| | Brunſwick | | Mecklenburg |
| | Cumberland | | Rockingham |
| | Robinſon | | Surry |
| | Duplin | | Montgomery |
| | Beaden | | Anſon |
| | Wayne | | Wilkes |
| | Moore | | Richmond |
| Newbern, 8 counties. | Craven | Morgan, 7 counties. | Bark |
| | Beaufort | | Green |
| | Carteret | | Rutherford |
| | Pitt | | Waſhington |
| | Dobbs | | Sullivan |
| | Hyde | | Lincoln |
| | Jones | | Hawkins |
| | Onſlow | Davidſon, 2 counties. | Davidſon |
| Halifax, 7 counties. | Halifax | | Sumner |
| | Northampton | | |
| | Martin | | |
| | Edgecombe | | |
| | Warren | | |
| | Franklin | | |
| | Naſh | | |

N. B. Theſe two are counties in the ſtate of Teneſſee.

In 1710 the number of inhabitants in this ſtate was computed at 6000; in 1787 at 270,000; in 1791 at 393,751, of whom 100,752 perſons were ſlaves; and in 1805, the number was 478,103, being about 9⅛ perſons to each ſquare mile. Of theſe 171,648 were white males, 166,116 white females, 133,296 ſlaves, 7,043 free blacks and mulattoes: and there appears to have been in 10 years an increaſe of 49,559 whites and 39,793 blacks, &c. or upon the whole of 84,352. The militia of this ſtate conſiſts of 50,000 men. The principal towns of North Carolina are Newbern, the largeſt, Edenton, Wilmington, Halifax, Hillſborough, and Fayetteville; each of which has, in its turn, been the ſeat of the general aſſembly, and the capital of the ſtate. But Raleigh, which is ſituated in Wake's county, near the centre of the country, (N. lat. 35° 56′. W. long. 79° 11′) has lately been eſtabliſhed as the metropolis. The chief rivers of this ſtate are Chowan and its branches, Roannoke, Tar Neus, and Cape Fear, or Clarendon. Moſt of theſe, as well as the ſmaller rivers, have bars at their mouths; and the coaſt affords no good harbour except cape Fear. The moſt remarkable ſwamps in this country are thoſe in Currituck county and on the line between this ſtate and Virginia. See Dismal. The moſt noted ſounds are Albemarle, Pamlico, and Core ſounds; and the capes are Look-out, Hatteras, and Fear. See their reſpective names.

North Carolina is, through its whole extent for 60 miles from the ſea, a dead level, and the greater part of this ſpace is foreſt-land, and barren. On the banks of ſome of the rivers, particularly the Roannoke, the land is fertile and productive; and in the other parts there are interſperſed glades of rich ſwamp, and ridges of oak land, of a black, fruitful ſoil. Through this whole level country marine productions are found in depths of 18 or 20 feet below the ſurface of the ground. At the diſtance of 60 or 80 miles from the ſea, the country riſes into hills and mountains, as in South Carolina and Georgia, which ſee. That part of North Carolina which lies W. of the mountains is a tract, about 500 miles long from eaſt to weſt, and upwards of 100 in breadth, of fine fertile country, watered by the Teneſſee, abounding with oaks, ſeveral kinds of locuſt trees, walnut, elm, lime, and cherry trees of large ſize, ſome of them being three feet in diameter. See Tenessee. Wheat, rye, barley, oats, and flax, thrive in the back hilly country; and Indian corn and pulſe of all kinds, in all parts. Cotton and hemp are alſo cultivated in a conſiderable degree, and might be raiſed in greater abundance; the cotton is planted annually; the ſtalk dying with the froſt. One man's labour will produce 1000 pounds in the ſeeds, or 250 fit for manufacturing. The natural growth of the plains in the low country is almoſt univerſally pitch-pine, which may be called the ſtaple commodity of North Carolina, as it affords various articles conſtituting about one-half of the exports of this ſtate. White and red oak are excellent and abundant; and the ſwamps furniſh cypreſs and bay trees in great plenty. The moſt common kinds of timber in the back country are oak, walnut, and pine; and in the moiſt gravelly ſoil is a ſpecies of oak, called "black jack." The miſletoe is alſo common; the principal wild fruits are plums, grapes, ſtrawberries, and black-berries. The country alſo abounds with medicinal plants and roots; ſuch as the ginſeng, Virginia ſnake root, Seneca ſnake root, and an herb of the emetic kind reſembling ipecacuanha. The rich bottoms are overgrown with canes. The produce of the back country, conſiſting of tobacco, wheat, Indian corn, &c. is chiefly carried to market in South Carolina and Virginia. The ſouthern interior counties carry their produce to Charleſton, and the northern to Peterſburg in Virginia. The exports from the lower parts of the ſtate are tar, pitch, turpentine, reſin, Indian corn, boards, ſcantling, ſtaves, ſhingles, furs, tobacco, pork, lead, tallow, bees-wax, myrtle-wax, &c. in which articles a trade is carried on chiefly with the Weſt Indies and the northern ſtates. From the latter they receive flour, cheeſe, cyder, apples, potatoes, iron wares, cabinet wares, hats, and dry goods of all kinds imported from great Britain, France, Holland, &c.; and from the Weſt Indies, rum, ſugar, and coffee. The exports in the year ending September the 30th 1791 amounted to 524,548 dollars; but in 1805, thoſe of the domeſtic produce amounted to 919,545, and of the foreign to 9,142, being in the whole 928,687 dollars.

In the flat country near the ſea-coaſt the inhabitants are ſubject, in ſummer and autumn, to intermitting fevers, which are often fatal; but the weſtern hilly parts of the ſtate are as healthy as any parts of the United States. The country is fertile, and full of ſprings and rivulets of pure water. The air is ſerene; and though the days are very hot, the nights are cool and refreſhing. Autumn is very pleaſant, and the winters are generally very mild; upon the whole, many of the inhabitants live to old age. Wheat harveſt commences with June, and that of Indian corn is early in September.

The weſtern parts of this ſtate, which have been ſettled within the laſt 40 years, are chiefly inhabited by Preſbyterians from Pennſylvania, the deſcendants of emigrants from the north of Ireland, and are very much attached to the doctrines, diſcipline, and uſages of the church of Scotland. They are regular and induſtrious. Some ſettlements of Germans, both Lutherans and Calviniſts, are interſperſed. The Moravians have ſeveral flouriſhing ſettlements in the upper parts of this ſtate, the principal of which are in Wachovia in the county of Surry, ſo called after an eſtate of count Zinzendorf in Auſtria; and particularly at Salem. The Quakers have a ſettlement at New Garden, in the county of Guildford, and ſeveral congregations at Perguimins and Paſquetank. The Methodiſts and Baptiſts are alſo numerous and increaſing. The inhabitants of Wilmington, Newbern, Edenton, and Halifax diſtricts, conſtituting about three-fifths of the ſtate, once profeſſed themſelves of the epiſcopal church; but many of them, during the progreſs of the late war between Britain and America, emigrated; and ſome material changes have ſince occurred. In December 1789, the general aſſembly of North Carolina paſſed a law, incorporating 40 gentlemen, viz. five from each diſtrict, as truſtees of the univerſity of this ſtate, and it has been ſince liberally endowed. There are alſo academies at Warenton, Williamſborough, and ſome others.

As to the habits and manners of the North-Carolinians we may obſerve, that they are moſtly planters, and live at a diſtance from one another of half a mile to three or four miles, on their reſpective plantations. Their country is plentiful; but they have little intercourſe with ſtrangers; however, they are fond of ſociety and hoſpitable to travellers. In the lower diſtricts of the country they have very few places for public and weekly worſhip of any kind, and for want of miniſters, theſe are neglected. The inhabitants of this ſtate appear to have as little taſte for the ſciences as for religion; and it is remarked, that leſs attention and reſpect are paid to the women here than in thoſe parts of the United States where the inhabitants have made greater progreſs in the arts of civilized life. Temperance and induſtry are not reckoned among the virtues of this ſtate; and much time is conſumed in drinking, idleneſs, and gaming at cards or dice; and alſo in cock-fighting and horſe-racing. Many of the interludes are filled up with boxing-matches, in which prevails the brutal practice of "gouging;" a ſpecies of diverſion, if it may be ſo called, which is thus performed: "when two boxers are worried with fighting and bruiſing each other, they come, as it is called, to cloſe quarters, and each endeavours to twiſt his fore-fingers in the ear-locks of his antagoniſt. When theſe are faſt clenched, the thumbs are extended each way to the noſe, and the eyes *gently* turned out of their ſockets. The victor, for his expertneſs, receives ſhouts of applauſe from the ſportive throng, while his poor *eyeleſs* antagoniſt is laughed at for his miſfortune." This barbarous practice, which we could hardly ſuppoſe to have exiſted, is ſaid to be prevalent among the lower claſs of people in both the Carolinas, and alſo in Georgia.

By the conſtitution of this ſtate, which was ratified in December, 1776, the legiſlative authority is veſted in two diſtinct branches, viz. a *ſenate* and *houſe of commons*, which, convened for buſineſs, are ſtyled the *general aſſembly*. The ſenate is compoſed of repreſentatives, one for each county, choſen annually by ballot; and the houſe of commons conſiſts of repreſentatives choſen in the ſame manner, two for each county, and one for each of ſix towns. The qualifications of a ſenator are one year's reſidence prior to his election in the county for which he is choſen, and a freehold of 300 acres: and thoſe of a member of the houſe of commons are the ſame reſidence, and a freehold of 100 acres, or ſuch a tenure for the term of his own life. A freeman of 21 years of age, who has been an inhabitant in the ſtate for 12 months immediately preceding the day of election, and who has poſſeſſed a freehold of 50 acres within the county for ſix months next before, and at the day of election, is entitled to a vote for a ſenator; and all freemen, 21 years of age, who have been inhabitants the year next before the election, and who have paid public taxes, may vote for a member of the houſe of commons. Judges of the ſuperior court; members of council; judges of admiralty; treaſurers; ſecretaries; attorney generals for the ſtate; clerks of record; clergymen; perſons denying the being of a God, the truth of the proteſtant religion, or the divine authority of the Old or New Teſtament; receivers of public monies, whoſe accounts are unſettled; and military officers in actual ſervice, are ineligible to a ſeat either in the ſenate or in the houſe of commons. The ſenate and houſe of commons, or general aſſembly, annually elect by ballot the governor, who muſt be 30 years of age, a reſident five years, and poſſeſs a freehold worth 1000l., and who is ineligible to the office for a longer time than three years in ſix ſucceſſive years. The aſſembly alſo elects ſeven perſons to be a council of ſtate for one year, with whoſe advice the governor may grant pardons, except for crimes proſecuted by the aſſembly, fill vacancies in office till the enſuing ſeſſion, and lay embargoes. The governor is liable to impeachment and proſecution in the ſupreme court for mal-adminiſtration. The ſalary of the governor is dependent on the legiſlature. The general aſſembly appoints the treaſurer, the ſecretary, judges of the ſupreme courts of law and equity, judges of admiralty, the attorney general, and all the ſuperior military officers, who hold their offices during good behaviour, and are removeable by conviction in the ſupreme court. All bills muſt alſo be prepared by the general aſſembly, and they muſt be read three times in each houſe, and be ſigned by the ſpeakers of both houſes, before they paſs into laws. Juſtices of the peace, recommended by the repreſentatives, are commiſſioned by the governor, and hold their offices during good behaviour. The conſtitution allows of no religious eſtabliſhment. The repreſentatives of this ſtate in congreſs are 12; and the ſenators are two.

The hiſtory of this ſtate in the earlieſt period of its ſettlement is confounded with that of South Carolina, from which it was not ſeparated ſo as to be erected into a diſtinct province till the year 1728; and the appropriate particulars of it cannot be accurately aſcertained. See the next article. The firſt permanent ſettlement in North Carolina ſeems to have been made about the year 1710, when a number of Palatines from Germany, who had been reduced to very indigent and diſtreſſed circumſtances by a calamitous war, were conveyed thither. The proprietors of Carolina, hoping to derive advantage from their labour in the cultivation of their lands, reſolved to afford every poſſible encouragement to ſuch emigrants. Accordingly ſhips were provided for their tranſportation; and upon their arrival governor Tynte granted them a tract of land in that province, ſince called Albermarle and Bath precincts, where they ſettled and hoped to have found an unmoleſted retreat, though in a kind of wilderneſs, from the deſolations of a war, which then raged in Europe. It was not long, however, before their calamities were renewed by a dangerous conſpiracy formed againſt them in 1712 by the Coree and Tuſcorora tribes of Indians. The attack was ſecret and unexpected; and the maſſacre of the inhabitants was as general and bloody as it was ſudden. Some few eſcaped the indiſcriminate ſlaughter and gave the alarm; and as ſoon as the news of the ſad diſaſter had reached the province of South Carolina, governor Craven diſpatched a force to their relief. The Tuſcororas were defeated; many of them were killed, and others taken priſoners. The remainder of the tribe, having loſt about a thouſand of their original number, ſoon after abandoned the country, and joined the five nations, with which they have ever ſince remained. The infant colony from this time remained in peace, and continued to flouriſh under the general government of South Carolina, till about the year 1729, when ſeven of the proprietors accepted 22,500l. from the crown, and ſurrendered its property and juriſdiction. This agreement between the proprietors and the crown was ratified by act of parliament, in 1729; a clauſe in the act reſerving to lord Granville, one of the proprietors, his eighth ſhare, which continued legally veſted in his family till the revolution in 1776. Lord Granville's ſhare formed a part of the preſent ſtate of North Carolina. About the year 1729, the extenſive territory belonging to the proprietors was divided into North and South Carolinas; and the limits of the former were aſcertained and eſtabliſhed by an order of George II. Accordingly they remained ſeparate royal governments till they became independent ſtates.

Carolina, *South*, one of the United States of America, bounded on the north by North Carolina, on the eaſt by the Atlantic Ocean, and on the ſouth and ſouth-weſt by the Savannah river, and a branch of its head water, called Tugulo river, which divides this ſtate from Georgia. The weſtern boundary has not yet been accurately aſcertained. It lies between 32° and 35° N. lat., and between 79° and 83° 30′. W. long.; extending in length about 200 miles, in breadth 125, and containing 25,000 ſquare miles, of which 2,075,000 acres are improved land. It is divided into nine diſtricts. Charleſton, Beaufort, and George-town, conſtitute what is called the "Lower Country," and contain 19 pariſhes, and 28,694 white inhabitants; ſend to the legiſlature 70 repreſentatives, and 20 ſenators, and pay taxes to the amount of 28,081l. 5s. 11d. Ninety-ſix, Waſhington, Pinckney, Camden, Orangeburg, and Cheraw diſtricts are comprehended in the "Upper Country," and contain 23 counties, and 110,902 white inhabitants;

ſend to the legiſlature 54 repreſentatives, and 17 ſenators, and pay taxes to the amount of 8,390l. 2s. 3d. See each of the above articles. The inequality of repreſentation is very obvious; and attempts have been made by the upper diſtricts to rectify it. By a late arrangement the name of county is given to the ſubdiviſion of thoſe diſtricts only, in which county courts are eſtabliſhed. In the lower diſtricts the ſubdiviſions are called pariſhes and introduced merely for the purpoſe of electing the members of the legiſlature of the ſtate. The whole number of inhabitants in 1787 amounted to 180,000; in 1791 to 240,000; in 1805 to 345,591, being about 14 perſons to each ſquare mile, and including 100,916 white males, 95,339 white females, 146,151 ſlaves, and 3,185 free blacks and mulattoes. In 10 years the increaſe of whites has been 56,077, of blacks, &c. 40,441; ſo that the whole increaſe has been 96,518. The militia has conſiſted of 35,785 perſons. The capital of South Carolina is Columbia, ſeated on the Congaree river, in N. lat. 34° 1′. W. long. 80° 57′., and containing 100 houſes and 700 inhabitants. Charleſton is alſo a town of note. The only harbours of any note are thoſe of Charleſton, Port-royal, and George-town. The iſlands that border the ſea-coaſt of this ſtate are numerous and convenient; and ſerve many uſeful purpoſes of navigation. The north part of the harbour of Charleſton is formed by Bull's, Dewee's, and Sullivan's iſlands. Oppoſite to Charleſton, on the other ſide of the harbour, is James' iſland, which is the reſidence of about 50 families. Farther ſouth-weſt is John's iſland, larger than James's; and theſe two iſlands are ſeparated by Stono river, which forms a convenient and ſafe harbour. Connected with John's iſland by a bridge is Wadmelaw, having to the eaſt the ſmall iſles of Keywaw and Simmon. Between theſe and Ediſto iſland is North Ediſto inlet, which affords a good harbour for ſmall veſſels. South of Ediſto iſland is South Ediſto inlet through which enter, from the northward, all veſſels bound to Beaufort, Aſheepoo, Combahee, and Cooſaw. On the S.W. ſide of St. Helena iſland lies a cluſter of iſlands, one of the largeſt of which is Port-royal; adjacent to which lie St. Helena, Ladies iſland, Paris iſland, and the Hunting iſlands, being five or ſix in number and deriving their name from the deer and wild game found upon them. Beyond Broad river is Hilton Head, the moſt ſouthern ſea iſland in Carolina. Weſt and ſouth-weſt of Hilton Head lie Pinckney's, Bull's, Dawfuſkies', and ſome ſmaller iſlands, between which and Hilton Head are Calibogee river and ſound, which form the outlet of May and New rivers. The ſoil on theſe iſlands is in general better adapted to the culture of indigo and cotton than the main land; but leſs adapted to rice. The natural production is the live oak, ſo excellent for ſhip-timber, beſides the palmetto or cabbage tree ſo uſeful in the conſtruction of forts. The principal rivers of this ſtate, which are navigable, are the Savannah, the Ediſto, the Santee, and the Pedee, with their branches; which ſee reſpectively. Thoſe of a ſecondary ſize, being ſuch as occur when you paſs from north to ſouth, are Wakkamaw, Black, Cooper, Aſhepoo, and Combahee rivers. To the third claſs we may refer thoſe which extend a ſhort diſtance from the ſea, and by branching off into various creeks ſerve as drains to the inland ſwamps, or are merely arms of the ſea. The tide flows in no part of the ſtate above 25 miles from the ſea. Canals are executed, projected, or begun for connecting Cooper and Santee rivers, and for uniting the Ediſto with the Aſhley; and it is alſo propoſed to make a waggon-way from the ſettlements in South Carolina over the mountains to Knoxville, in the ſtate of Tenneſſee.

This country, with the exception of the high hills of Santee, the Ridge, and ſome few other hills, is like one extenſive plain, till you reach the Tryon and Hog-back mountains, 220 miles N.W. of Charleſton. The elevation of theſe mountains above their baſe is 3840 feet, and above the ſea coaſt 4640. The mountains weſt and north-weſt of theſe riſe much higher, and form a ridge which ſeparates the waters of Tenneſſee and Santee rivers. The whole ſtate, to the diſtance of 80 or 100 miles from the ſea, is in general low and level, and abounds more or leſs, eſpecially near the rivers, with ſwamps or marſhes, which are capable of being cleared and cultivated, and which then yield in favourable ſeaſons, an annual income of from 20 to 40 dollars per acre. In the diſtance above mentioned, the land riſes by a gradual aſcent from the ſea-coaſt about 190 feet. The traveller, as he proceeds in a W.N.W. courſe from Charleſton, meets with a ſucceſſion of ſand hills, bearing little herbage and a few ſmall pines. The inhabitants are few, and find a ſcanty ſubſiſtence in their corn and potatoes. About 140 miles from Charleſton in this direction is the "Ridge" which is a fine high, healthy belt of land, well watered, and with a good ſoil, and extending from the Savannah to Broad River, in about 6° 30′ W. longitude from Philadelphia. Beyond this ridge commences a country exactly reſembling the Northern ſtates, Devonſhire in England, or Languedoc in France, where hills and dales variouſly intermixed diſplay their verdure and beauty. Wheat fields are common; and the air is found to be much more temperate and healthful than near the ſea. The hills are covered with valuable woods, the vallies are watered with beautiful rivers, and the fertility of the ſoil is equal to every vegetable production. This is called, by way of diſtinction, the "Upper Country;" and the inhabitants are actually diſtinguiſhed by their manners and modes of life, their tones of ſpeaking, and the articles which they cultivate. The land ſtill riſes as you advance; and at the diſtance of 220 miles in a north-weſt direction from Charleſton, the elevation of the land above the ſea-coaſt is found to be 800 feet. Here commences a mountainous country, which continues to the weſtern termination of the ſtate. There are four kinds of ſoil; *firſt*, the pine barren, merely valuable for its timber; with interſperſed tracts of land producing only graſs; theſe are called "Savannas" and furniſh a *ſecond* kind of ſoil, good for grazing. The *third* kind is that of the ſwamps and low grounds on the rivers, which is a mixture of black loam and fat clay, producing naturally and in abundance canes, and alſo cypreſs, bays, loblolly pines, &c. The high lands, commonly known by the name of Oak and Hickory lands, conſtitute the *fourth* kind of ſoil, which yields oak, hickory, walnut, pine, and locuſt. On theſe lands, in the low country, is cultivated principally Indian corn; and in the back country they alſo raiſe tobacco in large quantities, wheat, rye, barley, oats, hemp, flax, and cotton. It is, moreover, well aſcertained that olives, ſilk, and madder may be as abundantly produced in South Carolina (and alſo in Georgia) as in the ſouth of France. There is little fruit in this ſtate: they have indeed oranges which are ſour, plenty of figs, a few limes and lemons, pomegranates, pears, and peaches; apples are ſcarce, but melons are raiſed in perfection. The river and inland ſwamps, eſpecially thoſe within the reach of the tide, are well adapted to the culture and growth of rice; the ſwamps above the head of the tide are occaſionally planted with corn, cotton, and indigo; the ſoil is very rich, yielding from 40 to 50 buſhels of corn per acre. It is curious to obſerve, that in the iſlands near the ſea-coaſt, and for 40 or 50 miles withinland, and on the rivers much farther, the cultivators are all ſlaves. No white man cultivates a farm without negroes. The articles produced are corn, rye, oats, pulſe of every kind, potatoes, which, with the ſmall rice, are the food of the negroes; rice, indigo, hemp, and cotton, are for exportation. The plough and harrow are now introduced in the tillage of the land, together with other agricultural improvements. In the middle ſettlements, the negroes are leſs numerous; the land is not well adapted to rice; it produces tolerably good indigo weed, and tobacco for exportation; the farmer contents himſelf with raiſing corn, potatoes, oats, rye, poultry, and a little wheat. In the upper country, there are few negroes: the plough is almoſt wholly uſed; and the farmer depends for ſubſiſtence upon his own labour and that of his family. Indian corn, wheat, rye, barley, oats, potatoes, &c. are raiſed for food; and tobacco, wheat, cotton, hemp, flax, and indigo for exportation. Vines may be cultivated to great advantage; and a great variety of medicinal herbs and roots, as ſnake root, pink root, ginſeng, &c. is furniſhed in various parts of the ſtate. This country abounds with precious ores, ſuch as gold, ſilver, lead, black lead, copper, and iron. There are alſo ſeveral pellucid ſtones of different hues, rock cryſtal, pyrites, petrified ſubſtances, coarſe carnelian, beautifully variegated marble, vitreous ſtone and ſand, red and yellow ochres, potter's clay, fuller's earth, chalk, crude alum, ſulphur, nitre, and vitriol.

The iron works of this country, called the "Æra Ætna iron-work," are ſituated in York county, within two miles of the Catawba river. The Æra furnace was built in 1787, and the Ætna in 1788. Mr. W. Hill, one of the proprietors of the works, has contrived, by means of a fall of water, to blow all the fires of the forges and furnaces, ſo as to render unneceſſary the uſe of wheels, cylinders, or any other kind of bellows. The machinery for this purpoſe is ſimple and cheap.

In the middle, and eſpecially in the upper country, the people manufacture their own cotton and woollen cloths, and moſt of their tools for huſbandry; but in the lower country, they depend on being ſupplied by the merchants.

This ſtate furniſhes all materials of the beſt kind for ſhip-building. The live oak, and the pitch and yellow pines, are of a ſuperior quality. The indigo manufactured in this country will ſoon rival that of the French. For the encouragement of emigrants it has been announced that a monied capital may be profitably employed in erecting mills, for making paper, for ſawing timber, and eſpecially for manufacturing wheat-flour; in tanning and manufacturing leather, cattle being eaſily raiſed and of courſe hides being very cheap; in making bricks, and in making pot-aſh.

The ſtate of education, and, of courſe, literature, deſerves greater encouragement than they have yet found in this ſtate. However, reſpectable academies have been eſtabliſhed in Charleſton, Beaufort, Port Royal iſland, and in other parts of the country. Three colleges have been incorporated by law, one at Charleſton, one at Winnſborough, in the diſtrict of Camden, and the other at Cambridge, in the diſtrict of Ninety-ſix. Farther improvement in this reſpect may be reaſonably expected, as the legiſlature in 1795 appointed a committee to conſider the beſt means of eſtabliſhing ſchools in the different parts of the ſtate. Since the revolution, all denominations of Chriſtians have been put upon an equal footing, and there have been no diſputes between different religious ſects. The people are allowed by the conſtitution to chuſe their own miniſters, and they are required, when choſen, to ſubſcribe a general declaration expreſſing their reſolution to conform in their public inſtruction to the ſcriptures, to be diligent in the exerciſe of their miniſterial functions, and to be attentive to their own conduct. The upper parts of this ſtate are ſettled chiefly by Preſbyterians, Baptiſts, and Methodiſts. The former, including the congregational and independent churches, are the moſt numerous; the Epiſcopalians rank next, and are ſucceeded, with regard to number, by the Baptiſts, Methodiſts, &c. The Catabaws are the only nation of Indians in this ſtate; and they have but one town, called *Catabaw*: (which ſee.) The Creeks and Cherokees, in the weſt, ſtill retain their names and a portion of their ancient territories on the frontier of the ſtate. The moſt noted nations among the aborigines of South Carolina were the Stonoes and Weſtoes, the Sarannees, Apalaches, Congarees, Eſares, and Yamaſſees, in the eaſt and in the centre, who are now either extinct, or mingled with other tribes. On the ſea-coaſt the proportion of ſlaves far exceeds that of freemen; and the greater part of the white population is found in the weſtern parts of the ſtate. The Carolinians, it is ſaid, ſooner arrive at maturity than the natives of colder climates; but though they are diſtinguiſhed by quickneſs and vivacity of genius, they are generally deſtitute of that enterpriſe and perſeverance, which are requiſite for the higheſt attainments in the arts and ſciences. As they inhabit a fertile country, cultivated by ſlaves, and producing plenty, they have few motives to enterpriſe. Their wealth furniſhes them with the means of hoſpitality, in the uſe of which they are very liberal. In their manners the Carolinians are eaſy and affable, as well as polite and attentive to ſtrangers. Although the ladies want the bloom of the north, they have an engaging delicacy in their appearance and manners, and many of them poſſeſs the polite and elegant accompliſhments. The moſt faſhionable amuſement in this ſtate is hunting; gaming of all kinds is more diſcountenanced among faſhionable people in this than in any of the ſouthern ſtates. Twice a year however they have their horſe-races. In the conduct of their funerals the people of the richer claſs are leſs attentive to propriety than they are on other occaſions; as wine, punch, and all kinds of liquors, tea, coffee, cake, &c. are diſtributed in profuſion, when they are aſſembled to render their laſt tribute of reſpect to the dead. The climate varies in different parts of this ſtate. Along the ſea coaſt bilious diſeaſes and fevers of ſeveral kinds are prevalent between July and October. Theſe diſeaſes are occaſioned by a low, marſhy country, which is overflowed for the ſake of cultivating rice; but though a reſidence in or near the ſwamps is very injurious to health, it has been ſatisfactorily aſcertained, that by merely removing, 3 miles from them, into the pine land which occupies the middle ground between the rivers, the autumnal fevers may be avoided. The upper country, ſituated in the medium between extreme heat and cold, is as healthful as any part of the United States.

The little attention that is paid to manufactures in this ſtate occaſions a great conſumption of foreign imported articles; and yet the exports leave a balance in favour of the ſtate, except when there are large importations of negroes. The principal articles exported from this ſtate are rice, indigo, tobacco, ſkins of various kinds, beef, pork, cotton, pitch, tar, roſin, turpentine, myrtle-wax, lumber, naval-ſtores, cork, leather, pink-root, ſnake-root, ginſeng, &c.; and in the moſt ſucceſsful ſeaſons, 140,000 barrels of rice, and 1,300,000 pounds of indigo have been exported in a year. In the year ending Sept. 30, 1791, the amount of exports from this ſtate was 2,693,267 dollars 97 cents.; in the year ending Sept. 1795, 5,998,492 dollars 49 cents.; in 1805, the exports of domeſtic produce amounted to 5,142,100 dollars, and of foreign ditto to 2,309,516 dollars, or in the whole to 7,451,616 dollars. At this time the ſhipping of the ſtate comprehends 70,000 tons. The annual expenditure amounts to 173,000 dollars.

By the conſtitution, framed June 3, 1790, the legiſlative authority conſiſts of two branches, a "ſenate" and "houſe of repreſentatives," ſtyled "General Aſſembly;" the ſenators are elected by the people for four years, with a biennial rotation of one-half; and it is required that they be thirty years old, reſident five years, and poſſeſs a freehold worth £300, if inhabitants of the county where they are elected, or worth £1000, if they live elſewhere: the repreſentatives are choſen for two years; and they muſt be twenty-one years of age, be reſident three years, poſſeſs a freehold of five hundred acres and ten negroes, or real eſtate of £150 value, if they live in the diſtrict; but if not reſident, a freehold worth £500. The electors muſt be twenty-one years of age, be reſident two years, and poſſeſs a freehold of fifty acres, or town lot, or make a payment of a tax of three ſhillings. With the houſe of repreſentatives originate money-bills, and they have the power of impeaching officers of ſtate. It belongs to the ſenate to try impeachments; and conjointly with the other houſe to appoint commiſſioners of treaſury, ſecretary, ſurveyor, and judges. All officers in the judiciary department are appointed by the General Aſſembly during good behaviour; and receive a ſtated ſalary: the ſheriffs are appointed for four years. The executive branch conſiſts of a governor and lieutenant-governor; the former, choſen by the legiſlature for two years, but re-eligible after an interval of four years, with a certain ſalary, muſt be thirty years of age, reſident ten years, and poſſeſs an eſtate worth 1500 pounds ſterling: to him it belongs to remit fines, if not particularly reſtricted; to reprieve and pardon, except in caſes of impeachment; and he is removable, upon conviction of mal-adminiſtration, by two thirds of the ſenate. The lieutenant-governor is elected at the ſame periods, with the ſame qualifications. This ſtate has eight repreſentatives in congreſs, and two ſenators.

The firſt ſettlement in Carolina ſeems to have been made during the troubles in France, ſubſequent to the reformation; when Jaſper de Coligni, a principal commander of the proteſtant army, fitted out two ſhips, and ſent them with a colony to America, under the command of Jean Ribaud, for the purpoſe of ſecuring a retreat from perſecution. Ribaud landed at that point which is now called Albemarle river, in North Carolina. This colony endured incredible hardſhips and was extirpated by the Spaniards. Towards the latter end of the reign of Queen Elizabeth, Sir Walter Raleigh made ſome unfortunate attempts to fix colonies in Carolina; and in 1608 Carolina, which had been formerly called Carolana, and alſo Georgia, were thought very proper for propagating ſilk, wine, pot-aſhes, cochineal, &c. In 1629 king Charles I. made a grant to his attorney-general, Sir Robert Heath, and to his heirs, of the country called Carolana, including N. and S. Carolina, Georgia, &c.; and Sir Robert afterwards conveyed this province to the earl of Arundel, who was at the expence of planting ſeveral parts of it. But no permanent ſettlement ſeems to have been made in Carolina, till after the reſtoration of king Charles II., when this king granted by his firſt charter, dated March the 24th, 1662—1663, to Edward earl of Clarendon, then lord high chancellor of England, and ſeven others, all lands lying between the 31ſt and 36th degrees of North latitude, and extending weſterly as far as the South Seas; and in 1665 a ſecond charter was granted to the ſame perſons, enlarging their boundaries as far as 29° N. lat. towards the ſouth, and 36° 30′ N. lat. towards the north. Of this extenſive territory, the king conſtituted lord Clarendon and the other ſeven perſons abſolute lords-proprietors, and inveſted them with all the neceſſary powers for planting and governing it. The proprietors engaged the famous Mr. Locke to frame for them a conſtitution and body of laws, which conſiſted of 120 articles. The ſettlement, however, was not completed till the year 1669, when Colonel William Sayle, being appointed firſt governor of this country, embarked with a colony, and ſettled in the neck of land where Charleſton now ſtands. During the proprietary government, which laſted 50 years (reckoning from 1669 to 1719), the colony was haraſſed with perpetual diſſenſions, attacked by the Indians, by pirates, and by the French and Spaniſh fleets, and embroiled by internal quarrels, partly with their governors, and partly on account of religion between the epiſcopalians and diſſenters; the proprietary government was found ineffectual; and a revolution taking place about the year 1719, the government became regal. In 1728 the proprietors, with the exception of lord Granville, ſurrendered their property and juriſdiction to the crown for the ſum of £22,500 ſterling; and at this time the conſtitution was new modelled; and the territory, limited by the original charter, was divided into North and South Carolinas. From this period the colony began to flouriſh; and between the years 1763 and 1775, the number of inhabitants was more than doubled. During the conteſt for independence, this ſtate was for three years the ſeat of war, ſuffered much, and loſt many of its beſt citizens. Since the peace it has availed itſelf of its agricultural and commercial advantages, and the abilities of its moſt diſtinguiſhed characters, and promiſes in proceſs of time to become one of the richeſt in the union. A diſpute having ariſen and long continued about the boundary line, ſeparating the two ſtates of South Carolina and Georgia, commiſſioners were appointed, in April 1787, by the contending ſtates, for the purpoſe of adjuſting the controverted boundary, and it was fixed as follows: the moſt northern branch or ſtream of the river Savannah, from the ſea or mouth of ſuch ſtream, to the fork or confluence of the rivers now called Tugulo and Keowee, and from thence the moſt northern branch or ſtream of the ſaid river Tugulo till it interſects the northern boundary line of South Carolina, if the ſaid branch of Tugulo extends ſo far north, reſerving all the iſlands in the ſaid rivers Savannah and Tugulo to Georgia—but if the ſaid branch or ſtream of Tugulo does not extend to the north boundary line of South Carolina, then a weſt line to the Miſſiſippi, to be drawn from the head ſpring or ſource of the ſaid branch of Tugulo river, which extends to the higheſt northern latitude, ſhall for ever hereafter form the ſeparation limit and boundary between the ſtates of South Carolina and Georgia." Morſe's Geog. and Gazetteer. Anderſon's Commerce. Mod. Un. Hiſt. vol. xxxvi. Sketch of the Geog. and preſent State of the united territories of N. America, &c. Philad. 1805.

**Carolina, La**, a town of Spain, and the capital of new ſettlements in the Sierra Morena; founded by D. Pablo de Olavide, a native of Peru; 20 miles N.E. of Andujar. The ſoil about Carolina conſiſts chiefly of ſand; and the rock is either limeſtone or gypſum. They produce olives, oil, wine, ſilk, wheat, barley, rye, oats, peas, Indian wheat, and lentils. They have no manufactures, for the profitable employment of the people; and, conſequently, theſe new ſettlements ſwarm with half naked beggars.

**CAROLINE**, is a ſilver coin of Sweden, worth about 1s. 2d. with the legend *ſi Deus pro nobis quis contra*. See alſo Carlin.

**Caroline**, is alſo a name given to the four books compoſed by order of Charlemage, to refute the ſecond council of Nice, with regard to the worſhip of images. They contain one hundred and twenty heads of accuſation againſt that council, drawn up by the biſhops of France, and firſt publiſhed in 1549, by M. du Tillet, biſhop of Meaux, under the title of Elia Phylira.

Caroline, in *Geography*, a county of North America in Virginia, ſituate on the ſouth ſide of Rappahannock river, which ſeparates it from King George's county. It is about 40 miles ſquare, and contains 17,489 inhabitants, including 10,292 ſlaves.—Alſo a town in this county; 6 miles S. of Port-royal.

Caroline, a county on the eaſtern ſhore of Maryland, bordering on Delaware ſtate to the Eaſt and containing 9506 inhabitants, including 2057 ſlaves. Its chief town is Danton.

Caroline *Iſlands*, or, as they are ſometimes called, the *New Philippines*, form the moſt extenſive range of iſlands in the Pacific Ocean, and comprehend thoſe that lie between about 138° and 165° E. longitude; and about 10° N. lat. This chain of iſlands appears to have been diſcovered by the Spaniards in 1686, and to have derived its name from the Spaniſh monarch Charles II. They are about 30 in number, and very populous, except three, that were uninhabited. The natives reſemble thoſe of the Philippines, and chiefly live upon fiſh and cocoa-nuts; nor does their language ſeem to be very different. Each iſle, it is ſaid, has its reſpective chief to whom it is ſubject, and all of them reſpect a monarch whoſe reſidence is at Lamurue. They believe in certain celeſtial ſpirits, and think they deſcend to bathe in a ſacred lake in Fallalo; but they have neither temples nor idols, nor any appearance of worſhip. Their dead are ſometimes thrown into the ſea, and others are interred, the grave being ſurrounded with a ſtone wall. The inhabitants of Yap, it is ſaid, worſhip a kind of crocodile, and have their magicians. Polygamy is allowed, and the Tamul, or chief of the large iſle of Hogoleu had nine wives. Criminals are baniſhed from one iſle to another. Theſe iſlanders do not appear to have any inſtruments of muſic, but their dances are accompanied with ſongs. Their only weapons are lances, armed with bone. Negro ſlaves are not unknown in this remote region; and in one or two of the iſlands the breed is ſaid to be mingled: 29 Spaniards having been left on one of theſe iſlands, who are ſuppoſed to have married and ſettled. But their principal population ſeems to have been derived from the migrations of the fairer race from the Philippine iſlands, and farther eaſtward; and theſe were moſt probably occaſioned by ſtreſs of weather, which drove their canoes from iſland to iſland, and from one group to another, that had not been before peopled. The people of Ulea are reported to be more civilized than the reſt, and much to reſemble thoſe of the Pelews. The moſt conſiderable of the Carolines is Hogoleu, about 90 Britiſh miles in length and 40 in breadth. Next to this, but not above a third part of its ſize, is Yap, in the weſtern extremity of the range. Some few ſmall groups of iſlands have been diſcovered in the eaſtern extremities of this chain, which may be properly claſſed under the ſame denomination. In 1733, Cantova, a Jeſuit miſſionary, was maſſacred with eight Spaniards in the iſle of Mogmog. A particular chart of theſe iſlands has been conſtructed after that of this Jeſuit, and the relations of other miſſionaries, which have been printed as a ſupplement to the "Hiſtoire des Navigations aux Terres Auſtrales," by De Broſſes. See vol. ii. See alſo the Preliminary Diſcourſe to the Miſſionary Voyage, p. 86.

Caroline *Waters* and *Baths*. See Carlsbad.

CAROLINEA, in *Botany*, (in honour of Sophia Carolina, marchioneſs of Baden, a liberal patroneſs of botany) Linn. Jun. Supp. p. 51. Schreb. 1125. Willd. 1282. (Pachira, Aubl. 291. Juſſ. p. 279. Pachirier, Savigny in Encyc.) Claſs and order, *monadelphia polyandria*. Nat. ord. *Columniferæ*, Linn. *Malvaceæ*, Juſs.

Gen. Ch. *Cal.* ſimple, one leafed, bell-ſhaped, very ſhort, truncate, obſcurely five-furrowed, ſlightly emarginate between each furrow, ſo as to appear ſomewhat five toothed, ſurrounded by five globular bodies at its baſe. *Cor.* petals five, very long, ſword-ſhaped, nearly erect, concave, rather acute, reflexed at the tip, inſerted into the baſe of the calyx, thick, caducous. *Stam.* filaments about 300, ſhorter than the petals, united in their lower half into a tube, which incloſes the germ, divided about the middle into from 10 to 15 diſtinct bundles, which in their upper part are again divided into about as many capillary filaments; theſe filaments are ſometimes ſingle, but are moſt commonly bifid more than half way down, each diviſion bearing an anther; anthers upright, oblong, a little recurved. *Piſt.* germ ſuperior, furrowed; ſtyle filiform, the length of the ſtamens; ſtigmas five, lanceolate, acute. *Peric.* capſule very large, egg-ſhaped, coriaceous, furrowed, one-celled, opening at the ſummit with numerous valves. *Seeds* numerous, angular, thick, lying one upon another.

Obſ. The younger Linnæus attributes to his plant an inferior germ, and a two-celled pome, with twin ſeeds in each cell, whence Juſſieu and Savigny have expreſſed a doubt whether it be the ſame with that of Aubley; but as he expreſsly quotes Aubley's figure, it ſeems moſt probable that his deſcription is in theſe reſpects erroneous.

Eſſ. Ch. *Calyx* ſimple, bell-ſhaped. *Petals* five, very long. *Stamens* very numerous, monadelphous at their baſe. *Style* one. *Stigmas* five. *Capſule* egg-ſhaped, furrowed, one-celled, many-valved, many-ſeeded. Savig.

Sp. 1. C. *princeps*, Linn. Jun. Sup. p. 314. Mart. Willd. Swartz. Prod. 101. (Pachira aquatica, Aub. Guian. tab. 291, 292. Cavan. Diſſ. 3. tab. 72. fig. 1. Lam. Illuſt. Pl. 589.) "Leaves generally quinate; leaflets ovate-lanceolate." A large tree. *Trunk* much branched, from 15 to 20 feet high, 2 feet in diameter; bark aſh-coloured; wood ſoft and ſpongy; branches ſpreading widely. *Leaves* digitate; common petiole ſix or ſeven inches long, with two ſtipules at the baſe; leaflets from three to five, acute, almoſt ſeſſile, ſmooth, green, very entire, unequal in ſize, the middle one often more than ſeven inches long. *Flowers* ſuperb, more than a foot long, axillary, ſolitary; peduncles thick and very ſhort; petals yellow, caducous; filaments reddiſh; anthers purple. *Fruit* reſembling that of the cacao (theobroma), and thence called in Cayenne the wild cacao. The ſeeds are eatable, but as they are very flatulent when taken raw, they are moſt commonly roaſted. A native of marſhy ground in Guiana. 2. C. *inſignis*, Mart. Willd. Swartz. (Bombax grandiflorum, Cavan. Diſſ. 5. p. 295. tab. 154. Fromager grandiflore, Lam. Encyc. Xiloxochitl. Hernand. Mex. 63. with a figure.) See Bombax *grandiflorum*. The flowers of this ſpecies are ſo ſimilar to thoſe of the preceding, that Swartz ſeems to be juſtified in removing it from Bombax, under which it was formerly placed; but Savigny obſerves, that as he is not acquainted with the fruit, he does not abſolutely pronounce it either a Bombax or a Carolinea, though he is moſt inclined to the latter.

CAROLOSTADT, or Carlostadt, Andrew Bodenstein, in *Biography*, an eminent Lutheran divine, was a native of Carolſtadt, or Carlſtadt in Franconia, and having ſtudied in Germany and Italy, he became canon, archdeacon, and theological profeſſor at Wittemberg. When Luther took his degree of doctor in this univerſity, in 1512, Caroloſtadt was dean; and as ſoon as the former began to preach againſt popery, the latter joined him and became his colleague. His temper, however, was ardent, and not a little inclined to enthuſiaſm; and, determined to extend the reformation, he took the opportunity of Luther's abſence, in 1522, for this purpoſe, and excited a tumult at Wittemberg, by the ſuppreſſion of private maſſes, the removal of images out of the churches, and the abolition of the law which impoſed celibacy upon the clergy. In theſe meaſures, though Moſheim charges him with imprudence and precipitance, he acted in conjunction with Bugenhagius, Melancthon, Amſdorff, and others; and they were confirmed by the authority of the elector of Saxony. Luther, probably diſapproving ſome of theſe innovations, and diſpleaſed at their having been adopted without his authority, broke with Caroloſtadt on his return. Upon this the latter immediately retired to Orlamund; and attacking the opinion of Luther concerning the euchariſt, widened the breach between them. Caroloſtadt rejecting the abſurd and unintelligible conſubſtantiation of Luther, repreſented this ordinance as a commemoration of Chriſt's death, and not as a celebration of his bodily preſence; and in order to evade the difficulty attending the expreſſion, "This is my body," he alleged, that Chriſt pointed to his own body, when he made this declaration, and not to the bread. Caroloſtadt was the firſt Proteſtant divine who took a wife; and againſt this part of his conduct Luther could have had no objection, as he imitated his example. His fanaticiſm, however, was a juſt ground of complaint; for, though he did not adopt the moſt cenſurable opinions of Munzer and his anabaptiſt aſſociates, and of thoſe enthuſiaſtic teachers, who pretended to a divine inſpiration, he nevertheleſs inclined to favour them, and was actually chargeable with ſome extravagancies that were obſervable in their tenets and conduct. Accordingly he was an advocate for the abolition of the civil law, with the municipal laws and conſtitutions of the German empire, and he propoſed ſubſtituting the law of Moſes in their place. He alſo diſtinguiſhed himſelf by railing at the academies, declaiming againſt human learning, and other follies. Having thus incurred the diſpleaſure of Luther, he was commanded to leave the electorate of Saxony; and he repaired to Swiſſerland, where he ſucceſsfully propagated his doctrines, firſt at Zurich, and afterwards at Baſil; probably without that attachment to fanaticiſm, which had given offence; becauſe, after his baniſhment from Saxony, he compoſed a treatiſe againſt enthuſiaſm in general, and againſt the extravagant tenets and violent proceedings of the anabaptiſts in particular. This treatiſe was addreſſed to Luther, and produced ſuch an effect on the mind of this reformer, that he pleaded the cauſe of the exile, and obtained from the elector a permiſſion for him to return to Saxony. After this reconciliation with Luther, he compoſed a treatiſe on the euchariſt, which breathes the moſt amiable ſpirit of moderation and humility; and, having peruſed the writings of Zuingle, in which his own ſentiments on that ſubject are maintained with the greateſt perſpicuity and force of evidence, he repaired, a ſecond time to Zurich, and from thence to Baſil, where he was admitted to the offices of paſtor and profeſſor of divinity, and where, after having lived in the exemplary and conſtant practice of every Chriſtian virtue, he died with the warmeſt effuſions of piety and reſignation, on the 25th of December, 1541. Nevertheleſs, his memory has been very unwarrantably reproached, and his character calumniated, by Moreri, Boſſuet, and Roman Catholic writers. Moſh. Eccl. Hiſt. by Maclaine, vol. iv.

CAROLOSTADIANS, or Carloſtadians, in *Eccleſiaſtical Hiſtory*, an ancient ſect, or branch of Lutherans, who denied the real preſence of Chriſt in the euchariſt, ſo denominated from their leader Caroloſtadius. See the preceding article. The Caroloſtadians are the ſame with what are otherwiſe denominated Sacramentarians, and agree in moſt things with the Zuinglians.

CAROLSTADT, in *Geography*. See Carlstadt.

CAROLUS, an ancient Engliſh broad piece of gold, ſtruck under king Charles I. whoſe image and name it bears. Its value has been eſtimated at twenty-three ſhillings ſterling; though at the time when it was coined, it is ſaid to have been only rated at twenty ſhillings.

Carolus is uſed for a ſmall copper French coin, mixt with a little proportion of ſilver, firſt ſtruck by Charles VIII. of France, whence it took its name; being, at the time when it ceaſed to be current, valued at ſix *deniers*.

CAROLY, or Curute, in *Geography*, one of the Laccadive iſlands in the Indian Sea, off the coaſt of Malabar. N. lat. 10° 32′. E. long. 72° 35′.

CAROMB, a town of France, in the country of Venaiſſin; 5 miles from Carpentras.

CARO-MOELLI, in *Botany*, Rheed. Mal. See Sideroxylon.

CARON, in *Geography*, a town of Perſia, in the province of Farſiſtan; 75 miles S. of Suſa.

CARONCULE, in *Ornithology*, the French name of the wattled ſtarling, *Sturnus carunculatus*.

CARONI, in *Geography*, a river of Dutch Guiana, or Surinam, which riſes N. of the lake Parima, and flows into the Orinoco.

CARONIA, a town of Sicily, on the N. coaſt, in the valley of Demona, on a river of the ſame name; 5 miles N.E. of Miſtretta.

CAROPELLA, a river of Italy, which runs into the gulf of Manfredonia, near Rioli.

CAROPI, in *Botany*, a name given by the inhabitants of the Philippine iſlands to a plant more uſually known among authors by the name of Tugus, greatly eſteemed by the natives, and ſuppoſed by Camelli to be the true *amomum* of the Greeks, ſo much valued in thoſe ancient times.

CAROPOLIS, in *Ancient Geography*, a town of Aſia Minor, in Caria. Steph. Byz.

CARORA, in *Geography*, a town of Terra Firma, in North America, about 110 miles N.E. from Gibraltar, on Maracaybo lake.

CAROTEEL, in *Matters of Commerce*, denotes a certain weight or quantity of divers kinds of goods, ex. gr. of cloves, from four to five hundred weight; of currants, from five to nine hundred weight; of mace, about three hundred weight; and of nutmegs, from ſix to ſeven and an half hundred weight.

CAROTIC is uſed by ſome writers to denote thoſe who are ſeized with the Carus.

CAROTID, in *Anatomy*, from καροω, to lay aſleep; a name given to the large arteries which ſupply the head, from a miſtaken notion that tying theſe veſſels would induce ſleep. There are two *common carotid arteries*, a right and left; of which the former is a branch of the arteria innominata, the latter ariſes from the arch of the aorta. Each of theſe veſſels is again divided into an *external* and an *internal carotid artery*. For the deſcription of theſe veſſels, ſee Artery.

Carotid *canal*, is a winding paſſage in the petrous portion of the temporal bone, through which paſs the internal carotid artery, and the branches of the nervus motor externus, and of the vidian nerve, which join the ſuperior cervical ganglion of the great ſympathetic nerve. See Skeleton.

Carotid *foramen*, is the opening of the carotid canal on the ſurface of the baſis cranii. See Skeleton.

CAROTO, Giovanni Francesco, in *Biography*, a painter of hiſtory and portrait, was born at Verona in 1470, and having learned the principles of his art from Liberale Veroneſe, removed to Mantua and became a diſciple of Andrea Mantegna. Under his inſtruction, he acquired a readineſs in deſign and freedom of hand, which rendered him often ſuperior to his maſter; and many of his compoſitions were taken for thoſe of Andrea. In order to confute thoſe who attempted to degrade him by aſſerting that he was incapable of painting in a large ſize, becauſe he had principally delighted in ſmall figures, he finiſhed a noble deſign in the chapel of the Virgin at Verona, with figures as large as life; and thus eſtabliſhed his reputation. He died in 1546. His brother, whom he had inſtructed, deſigned all the curious remains of antiquity in and near Verona, and particularly the amphitheatre, afterwards engraved and publiſhed. He was a good architect, and is ſaid to have given leſſons to Paolo Veroneſe. Pilkington.

CAROUGE, in *Botany*, ſee Ceratomia *Siliqua*.

Carouge, in *Geography*, a town in the department of Leman, and chief place of a canton, in the diſtrict of Genève; the place contains 3250, and the canton 8,322, inhabitants: the territory includes 90 kiliometres and 10 communes.

Carouge *Point*, the northernmoſt extremity of the iſland of St. Domingo, in the Weſt Indies; 25 miles N. from the town of St. Jago.

Carouge of Buffon, in *Ornithology*, the Bonana bird of Engliſh writers, Oriolus *Bonana*.

CAROUGES, or Carrouges, in *Geography*, a town of France, in the department of the Orne, and chief place of a canton, in the diſtrict of Alençon; 4 leagues N.W. of Alençon. The place contains 1950, and the canton 15,130 inhabitants; the territory comprehends 300 kiliometres and 25 communes.

CAROVIGNO, a town of Naples, in the province of Otranto; 3 miles E. of Oſtuni.

CAROUZE, a cape on the north coaſt of the iſland of St. Domingo. N. lat. 19° 59′. W. long. 70° 53′.

CAROXYLON, in *Botany*, Thumb. Juſſieu, Lam. See Salsola *aphylla*.

CARP, in *Ichthyology*. See Cyprinus.—Common Carp. See Cyprinus *Carpis*.

Carp, *golden*. *Cyprinus Auratus*, Gold Fiſh. See Auratus Cyprinus.

Carp-*meals*, a coarſe kind of cloth, made in the northern parts of England.

Carp *ſtone*, *lapis carpionis*, a kind of gem ſaid to be found in the fauces, by others in the back-bone, of the *carp* fiſh, about the ſize of a pea, of a triangular figure, and white colour without, but yellow within. It is ſuppoſed to be of uſe againſt the ſtone, and ebullitions of the bile, being taken in powder, or held in the mouth.

CARPACK, in the *Egyptian Dreſs*, a ſort of red cap turned up with fur, which ſome make a cuſtom of wearing in common, though it is properly a part of the dreſs of the interpreters only, the ſame cap with muſlin tied round it being more properly the common dreſs.

Carpack, in *Geography*. See Carpates.

CARPÆA, from Καρπαια, a kind of dance or military exerciſe, in uſe among the Œnians and Magneſians, performed by two perſons; the one acting a labourer, the other a robber. The labourer, laying by his arms, goes to ſowing and ploughing, ſtill looking warily about him as if afraid of being ſurpriſed: the robber at length appears, and the labourer quitting his plough, betakes himſelf to his arms, and fights in defence of his oxen. The whole was performed to the ſound of flutes and in cadence. Sometimes the robber was overcome and ſometimes the labourer; the victor's reward being the oxen and plough. The deſign of this exerciſe was, to teach and accuſtom the peaſants to defend themſelves againſt the attack of ruffians.

CARPAL Ligament, or *ligamentum carpi proprium*, in *Anatomy*, is a ſtrong ligament under which the flexor tendons of the fingers, and the median nerve, enter the palm of the hand. See Ligaments.

CARPAS, in *Geography*, a town near the eaſtern point of the iſland of Cyprus, in the Mediterranean. It was anciently called *Carpaſia*, by Pliny *Carpeſium*, and by others *Carpeſſus*.

CARPASIÆ, in *Ancient Geography*, ſmall iſlands, ſituate very near to the iſle of Cyprus, and north of it, almoſt oppoſite to the town of Carpaſia.

CARPASIUM *linum*. See Linum *Carpaſium*.

CARPASUM, or Carpasium, in the *Materia Medica* of the ancients, the name of a poiſonous gum, exudating from a tree, ſo like myrrh in appearance that many periſhed by the error of uſing it inſtead of myrrh, or mixed among it. We are at this time wholly ignorant of its nature; but that it was a gum exudating from a tree, is plain from the account of Dioſcorides, who calls it *opocarpaſum*, as we do the flowing balm of Gilead, *opobalſamum*. The wood of the tree which produced it, he calls *xylocarpaſum*, in the ſame manner as the other wood is called *xylobalſamum*. This wood was little leſs poiſonous than the carpaſum, or gum itſelf. Galen tells us that the carpaſum was like myrrh of the very pureſt and fineſt kind; and that thoſe people who were moſt curious of all to have fine myrrh, often met with the carpaſum among it, and gave death, inſtead of relief, to the perſons to whom they adminiſtered it. We find, by the words of Galen, that this gum was not only like myrrh, but was alſo brought from the ſame places, and was often mixed with it. The fineſt myrrh uſually had moſt of this poiſon among it, and we may collect from the ſame account that it was a ſweet-ſcented gum, for otherwiſe no body could have miſtaken it for myrrh. Galen de Med. Simpl. lib. vii.

CARPATES, in *Ancient Geography*, the name given to a long chain of mountains, which terminated European Sarmatia on the ſouthern ſide; now called mount Carpack.

CARPATHIAN Mountains, in *Geography*, a grand and extenſive chain, which bounds Hungary on the north and eaſt, and which are called by the Germans the mountains of "Krapak," probably the original name, but ſoftened by the Roman enunciation. The Hungarians call them "Tatra." This enormous ridge extends in a ſemicircular form from the mountain of Javernick ſouth of Sileſia towards the north-weſt. But at the mountain of Trojeſká, the moſt northern ſummit, it bends to the ſouth-eaſt, to the confines of the Buckovina, where it ſends forth two branches, one to the eaſt and another to the weſt of Tranſylvania; which is alſo divided from Walachia by a branch running ſouth-weſt and north-eaſt. The whole circuit may be about 500 miles. Dr. Townſon (ſee his Travels in Hungary, 4to. 1796), viſited theſe Hungarian Alps from the vicinity of Keſmark, firſt proceeding to the "Green See," a lake amidſt the mountains, paſſing through foreſts of firs and delayed in his progreſs by the thick branches of a tree reſembling the pine, called "Krumholz," which were ſucceeded by rocks of limeſtone and granite. He computes that the Keſmark peak, which towards Hungary is a perpendicular rock, may be about 8508 feet above the level of the ſea. The Lomitz peak, to which he next proceeded, is, as he ſays, the higheſt of the whole Carpathian chain, and placed towards its centre; but he afterwards expreſſes a doubt, whether it be not rivalled, if not exceeded, by the Krivan, ſituated more towards the weſt, 20° 45′ of E. long. from London. He attained the ſummit of Lomnitz with ſome difficulty, and computed it to be 8640 feet above the level of the ſea, or not much above half the height of M. Blanc, or M. Roſa. He found it compoſed of grey granite like the rocks at the bottom; but with a ſmall mixture of a greeniſh black, earthy ſubſtance; nevertheleſs, the vegetation conſiſted of little except a few lichens. Theſe peaks are ſeldom viſited except by the hunters of the chamois, and ſome idle adventurers, who ſearch for gold and precious ſtones. The marmot alſo appeared; but our intelligent traveller denies that the ibex, or rock goat of the Swiſs Alps, is found in the Carpathian heights. The Krivan he afterwards aſcended with more eaſe, but found it inferior in height to the Lomnitz, being 8343 feet above the ſea. It is probable that ſummits of greater elevation ariſe in the eaſtern part of the chain; but there are no glaciers nor other tokens of the eternal winter of great altitude.

Dr. Townſon gives us a curious account of a Carpathian "Koſchar," and its inhabitants. This is a ſmall wooden hut in the midſt of a wood, built in the Swediſh manner; that is, with balks, whoſe ends are let into one another, ſomething in the manner of what carpenters call dove-tail work; it was only about ſix yards long, and three broad; and divided into two apartments, but by no means weather-tight. In the firſt apartment the head-ſhepherd, who is only a poor common peaſant, lives, and makes the cheeſe; the other is the magazine, where it is kept till it is ſent to Keſmark, which is every week. The buſineſs of the dairy is very ſimple: the ſheep are driven home thrice a day to be milked; and each milking is immediately made into cheeſe, for they make no butter. The rennet is poured upon the milk while it is warm, which is ſoon after beaten together, and preſently the head-ſhepherd gropes together with both his hands all the curds. This buſineſs appeared to be difficult, and laſted near half an hour: the curds then form one great maſs, and are taken out together, put into a cloth, and hung up; but no preſſure is uſed. The whey which remains is boiled, and acquires ſome conſiſtence, and this forms the food of the ſhepherds, and their only food for the whole ſeaſon; they have not even bread. After the ſhepherd and his men had eaten their ſupper, the men, of whom there are four or five, left the hut, and went to ſleep under ſheds around the fold. In the night the head-ſhepherd got up two or three times and hollowed to his men, to aſcertain whether they were upon the watch; and they always anſwered, to ſatisfy him that they were attentive to their duty. Great vigilance is requiſite againſt the wolves, and with all their precautions theſe animals had carried off their ſheep this ſummer.

The Carpathian ridge occaſionally branches towards the north and ſouth; in the former direction the moſt remarkable are the hills on the weſt of Sileſia, thoſe which adjoin to the ſalt mines of Wieliczka, a few miles ſouth-eaſt from Cracow in Poland, and thoſe which extend through part of Buckovina. Toward the ſouth a branch ſtretches from the centre of the chain towards Tokay; and there are other branches not accurately defined, which deſcend in the ſame direction from the eaſtern circuit. Pinkerton's Mod. Geog. vol. i.

Carpathian *Sea*, a part of the Mediterranean Sea, to the ſouth-weſt of the iſle of Rhodes, between this and the iſland of Candia. It derives its name from Carpathos, an iſland whoſe coaſts it bathes. This ſea has acquired celebrity from having been mentioned by Horace, Ovid, Propertius, and Juvenal.

CARPATHOS, or Carpathus, in *Ancient Geography*, now *Scarpanto*, an iſland of the Mediterranean Sea, ſituate between the iſle of Crete or Candia, to the ſouth-weſt, and the iſle of Rhodes to the north-eaſt. Strabo ſays that it contained four towns, one of which was called Niſyros; Scylax aſſigns it only three, and Ptolemy one, called Poſidium. It was long and ſtrait, and, according to Scylax, 100 ſtadia in length from nearly the ſouth to the north. Strabo ſays, that its circuit was 200 ſtadia. This iſland was anciently inhabited by ſome ſoldiers of Minos, the firſt of the Greeks who poſſeſſed the empire of the ſea. Many generations after his time, Jolcos, the ſon of Demoleon, an Argian, planted here a colony. Homer calls it Crapathos. It was alſo called Tetrapolis, from its four towns, Heptapolis, from its ſeven towns, and Pallenia, after the ſon of Titan, the firſt poſſeſſor of this iſland.

Carpathos, a town in the above iſland, which was a metropolitan ſee.

Carpathos, in *Geography*, a town of South America, in the country of Peru, and juriſdiction of Guamalies; moſt of the inhabitants are weavers, and employed in manufacturing bays, ſerges, and other ſtuffs.

CARPE de Mer, in *Ichthyology*, the name by which the common wraſſe, *labrus tinca*, is known in ſome of the maritime parts of France; called alſo *labre vielle*.

CARPELLA, in *Ancient Geography*, a promontory of Aſia, placed by Ptolemy in Carmania, very near to the promontory Armoſum, in the Perſian gulf, and S.W. of it.

CARPENTANOS Montes, in *Geography*, a chain of Spaniſh mountains, extending from near Soria on the N.E. and purſuing a S.W. direction towards Portugal. This chain is alſo called that of Urbia, or Guadarama.

CARPENTARIA, a large bay on the northern coaſt of New Holland, diſcovered in the year 1618. S. lat. 10° 20′. E. long. 130° 50′.

CARPENTER, an artificer, whoſe buſineſs is to cut, faſhion, and join timber and other wood for the purpoſes of building. The word is formed from the French *charpentier*, which ſignifies the ſame, formed of *charpente*, which denotes timber; or rather from the Latin *carpentarius*, a maker of *carpenta*, or carriages.

Carpenter, in *Ornithology*, a name given in St. Domingo to a ſpecies of wood-pecker, probably the green wood-pecker, or *picus viridis*, which it reſembles in its colour, form, note, and habits; becauſe it hollows and injures trees, particularly the plum trees, which it ſometimes bores through, and the cocoa-tree. The inhabitants of Cayenne give the name "Yellow Carpenter" to the yellow wood-pecker, the *picus exalbidus* of Gmelin, the *picus Cayanenſis albus* of Briſſon, and *picus flavicans* of Latham.

Carpenter's *Work*, in *Architecture*, includes the framing, flooring, roofing; the foundation, carcaſe, doors, windows, &c. In the menſuration of this kind of work, large and plain articles are uſually meaſured by the ſquare foot or yard, &c.; but enriched mouldings and ſome other articles are often eſtimated by running or lineal meaſure, and ſome things are rated by the piece. In meaſuring of *joiſts*, it ſhould be recollected, that only one of their dimenſions is the ſame with that of the floor; and the other will exceed the length of the room by the thickneſs of the wall, and $\frac{1}{3}$ of the ſame, becauſe each end is let into the wall about $\frac{2}{3}$ of its thickneſs. No deductions are made for hearths, on account of the additional trouble and waſte of materials. *Partitions* are meaſured from wall to wall for one dimenſion, and from floor to floor, as far as they extend, for the other; nor is any deduction made for door-ways, on account of the trouble of framing them. The *meaſure of centering for cellars* is found by means of a ſtring made to paſs over the ſurface of the arch for the breadth, and taking the length of the cellar for the length; but in groin-centering, it is uſual to allow double meaſure, on account of their extraordinary trouble. In *roofing*, the length of the houſe in the inſide, together with $\frac{2}{3}$ of the thickneſs of one gable, is to be conſidered as the length; and the breadth is equal to double the length of a ſtring which is ſtretched from the ridge down the rafter, and along the eaves board, till it meets with the top of the wall. For *ſtair-caſes*, take the breadth of all the ſteps, by making a line ply cloſe over them, from the top to the bottom, and multiply the length of this line by the length of a ſtep for the whole area. By the length of a ſtep is meant the length of the front, and the returns at the two ends; and by the breadth is to be underſtood the girt of its two upper ſurfaces, or the tread and riſer. For the *baluſtrade*, take the whole length of the upper part of the hand-rail, and girt over its end till it meet the top of the newel-poſt, for the length; and twice the length of the baluſter upon the landing, with the girt of the hand-rail, for the breadth. For *wainſcotting*, take the compaſs of the room for the length; and the height from the floor to the ceiling, making the ſtring ply cloſe into all the mouldings, for the breadth. Out of this muſt be made deductions for windows, doors, chimneys, &c.; but workmanſhip is counted for the whole, on account of the extraordinary trouble. For *doors*, it is uſual to allow for their thickneſs, by adding it to both the dimenſions of length and breadth, and then multiply them together for the area. If the door be pannelled on both ſides, take double its meaſure for the workmanſhip; but if one ſide only be pannelled, take the area and its half for the workmanſhip. For the *ſurrounding architrave*, girt it about the outermoſt part for its length; and meaſure over it, as far as it can be ſeen when the door is open, for the breadth. *Window ſhutters*, *baſes*, &c. are meaſured in the ſame manner. In the meaſuring by roofing for workmanſhip alone, all holes for chimney-ſhafts and ſky-lights are generally deducted. But in meaſuring for work and materials, they commonly meaſure in all ſky-lights, luthern-lights, and holes for the chimney-ſhafts, on account of their trouble and waſte of materials. Artificers meaſure flooring, partitioning, roofing, tiling, &c. by the ſquare of 100 feet. See MEASURE and CARPENTRY.

CARPENTERS, *Company of*. See COMPANY.

CARPENTER'S *Joint rule*. See RULE.

CARPENTER, *Ship*, a perſon employed in the docks, in the conſtruction and repairing of veſſels.

CARPENTER *of a ſhip*, is an officer at ſea, whoſe buſineſs is to have things in readineſs for keeping the veſſels in repair; and to attend the ſtopping of leaks, fiſhing of maſts or yards, alſo caulking, careening, breaming, and the like. He is to watch the timber of the veſſel that it does not rot, conſult frequently with other officers on the ſtate of the maſts, yards, &c. and in time of battle he is to have plugs, tompions, and planks ready, for repairing breaches made by the enemy's cannon.

The carpenter has a mate under him, and a crew or gang to command on neceſſary occaſions.

CARPENTORACTE MINORUM, in *Ancient Geography*, now *Carpentras*, a town of Gallia Narbonnenſis, N.E. of Avenio, ſeated upon an eminence near the river Auſonius. It was known to Pliny, who reckoned it among the Latin cities; and the Romans fixed in it a colony, probably in the time of Julius Cæſar. It belonged to the Memnicians, and had a triumphal arch, which is ſuppoſed to have been erected in commemoration of the victory obtained by Cn. Domitius Ænobarbus over the Allobroges and Auvernates, near the confluence of the Sorgue and the Rhone, about 2½ leagues from this city.

CARPENTRAS, in *Geography*, an ancient town of France, in the county of Venaiſſin, on the river *Auſon*, or chief place of a diſtrict, in the department of Vaucluſe. It was, before the revolution, the ſee of a biſhop, and ſtill exhibits many veſtiges of Roman magnificence. The north part of it contains 4,784, and the ſouth 3,705 inhabitants: the north canton has 9,300, and the ſouth 11,146 inhabitants. The extent of its territory comprehends 2 0 kilometres, and 8 communes, 5 in the northern, and 3 in the ſouthern part. It is diſtant 12 miles N.E. from Avignon. N. lat. 44° 4′. E. long. 5° 6′.

CARPENTRY, in *Civil Architecture*. The art of carpentry is, in general terms, the art of employing timber in the conſtruction of edifices. This is an art of the moſt general and important uſe, and of the higheſt antiquity; from the rude and ſolitary cabin to the rich and peopled city, in the earlieſt dawnings and the brighteſt periods of civilization, wherever nature has preſented to man her foreſts, the building art has found in them a material of univerſal application, commodious and economical. Carpentry is alſo intereſting to the fine arts, as its forms and operations have been the model of Grecian architecture, which has decorated and improved, but never renounced, its original type in wooden building. See the articles BUILDING and CIVIL *Architecture*.

With reſpect to the hiſtory of this art our information is ſhort and ſcanty. Pliny and Vitruvius, the only writers upon the building arts whoſe works have reached modern times, confine their obſervations upon carpentry chiefly to the choice and felling of timber; and it may be readily conceived that ancient buildings preſerve no ſpecimens of an art which is not calculated to reſiſt the injuries of time and the violences of rapine.

The remains of Egyptian architecture preſent, perhaps, the only example of a complete ſyſtem of building without the uſe of timber, while, at the ſame time, arches and vaults were unknown; for many Roman edifices, ſuch as the Pantheon, Temple of Peace, &c. might be quoted, which, by means of vaults, are independent of carpentry. In the Egyptian conſtruction, however, flat roofs of maſſy ſtone were uſed, which it was neceſſary to ſupport by thick-ſet avenues of columns, arranged at ſmall equal diſtances over the whole area. This form, though ſufficiently ſtriking and pictureſque, was of courſe incommodious, and only adapted to a dry climate. A pediment roof, therefore, was the firſt effort of conſtructive carpentry; this anſwered the purpoſe of an effectual ſhelter, by throwing off the humidity of the ſkies; at the ſame time, the rafters, in connexion with the tranſverſe beams of the ceiling, formed a truſs which would be gradually improved, and thus give the means of covering a wide ſpace, without any other ſupport than the external walls.

The invention of pediment roofs leads us naturally to Greece, where this member was an eſſential part of architecture. Beſides forming roofs, the Greeks appear to have uſed carpentry in the framing of floors, and for ruſtic buildings and other purpoſes. But in a warm climate, abounding with ſtone and marble, it is not probable, that wood was much uſed in the internal finiſhing of any edifices, except for thoſe objects wherein lightneſs and tenacity are eſſential qualities, as doors; though there are ſome remains of marble doors. Muſeum Worſleyanum.

This was leſs the caſe in Rome. The Romans ſeem to have uſed wood for nearly all the purpoſes of carpentry that the moderns are acquainted with. The roofs of buildings, the architraves, where they were very long, as in the Tuſcan temples and other caſes, the framing of floors, were all of this material. They alſo formed arches of ſlight timber grating for ſtuccoing; they had wooden cornices, and the ſtone ſeats of theatres were covered with boarding. Vitruvius, l. 4. l. 7. &c. We alſo read of conſiderable buildings, as amphitheatres, being erected of wood; ſuch was that built by Auguſtus to exhibit the ſhows on account of the victory of Actium, and many others, at Rome and different parts of Italy. It may be remarked that the beams of the roof were generally left uncovered by a ceiling; and ſometimes, in magnificent buildings, encruſted with bronze, and even gilded as in the baſilica of St. Peter, erected by Conſtantine.

In the colder countries of Europe, wood was more plentifully uſed, particularly in the interior works; and in the middle ages the art of carpentry partook of the bold and ſkilful conſtruction exhibited in that ſtyle of building commonly called gothic; of this the high pitched weighty roofs and lofty ſpires of the great cathedrals afford many ſtriking inſtances.

In more modern times carpentry ſtill improved. The wooden bridges of Palladio are examples of admirable conſtruction. Some French artiſts too have given eminent inſtances of ingenious carpentry, as Philibert Delorme in his method of conſtructing wooden domes; and Moulineau in his, which was executed at the Halle du Bled, at Paris, and various centres for large ſtone arches by Perronet, Hupeau, &c. In England the timber work of the dome and ſcaffolding of St. Paul's, and, in later times, many examples of centres, bridges and roofs may be cited as models of ſcientific carpentry: while in accuracy of execution, celerity and neatneſs of finiſhing, our workmen are unequalled. In the north of Europe, and particularly in Sweden and Norway, wood is almoſt the only material uſed for building; and of courſe the natives muſt have conſiderable practical ſkill in carpentry.

The art of employing timber in building is divided into two grand branches: carpentry and joinery. The firſt includes the larger and rougher kinds of work, and that part which is material to the conſtruction and ſtability of an edifice; and, generally, all the work wherein the timber is valued by the cubical foot. Joinery, which is called by the French, menuiſerie, from the menus bois, or ſmall wood employed in that art, includes all the interior finiſhing and ornamental wood-work, and is valued by the ſuperficial foot.

In this article we ſhall treat of the conſtructive part, or carpentry, ſtrictly ſpeaking, leaving what reſpects the material and belongs to architecture in general, as the choice of trees, the ſtrength of timber, &c. to the article TIMBER. We ſhall therefore ſuppoſe the material arrived in the carpenter's yard, and in the ſtate of whole or ſquared timber. The operations it undergoes from this period to its final employment in a building may be claſſed under two general heads, thoſe which relate to individual pieces, and thoſe which relate to their connexion with others. Under the firſt head are the operations of the pit ſaw, too generally known to need deſcription, by which the whole timber is divided and reduced to the required *ſcantlings;* this term, from the French, *echantillon,* means dimenſions, relative to breadth and thickneſs without reſpecting length:—Planing, which is giving a ſmooth face to wood by means of a familiar inſtrument called a plane, conſiſting of a chiſel fixed in a frame, ſerving as a handle, by which the workman moves it along over the ſurface of the timber, ſhaving off its inequalities: timber thus prepared is ſaid to be wrought:—Mouldings of various forms, and performed with particular planes or chiſels:—Rebating, which conſiſts in diminiſhing the width of a ſquare, or rectangular piece of timber, for a certain depth on one edge, thus taking off a rectangle of the whole width, and leſs than the depth of the original piece; this method is particularly uſed in door-caſes, and the frames of caſement windows, the *rebate* forming a kind of ledge for the door or caſement to ſtop againſt:—Grooving or plowing, in which a narrow channel is excavated out of the thickneſs of the timber: the groove is either ſquare, forming an equal ſection in the whole depth, or wider at bottom than at top, which is called a *dovetail* groove. Timber may alſo be *ſunk* where the piece is formed like a wedge, or rounded; or *bevilled* in various ſhapes, which means when the ſection forms a figure without right angles.

We now come to the ſecond and moſt important head of the operations by which timbers are connected together. Theſe are generally ſpeaking, by *mortiſe* and *tenon,* the firſt an excavation, and the ſecond a projection, adapted to it; or by wooden pins or nails, ſpikes, ſcrews, bolts, ſtraps, and other faſtenings of metal, or by glue, though this laſt is ſcarcely uſed except in joinery.

The following is a deſcription of the moſt general and uſeful methods of joining timbers. Firſt, by ſimple tenon and mortiſe, as when joiſts are framed into trimmers, the moſt uſual method is to make the tenons in the middle of the breadth of the trimmer with a plain ſhoulder; ſee *fig.* 1. *Plate* LXII. of *Architecture,* which repreſents a ſection of the trimmer, and a part of the joiſt, framed in a longitudinal direction. But when binding-joiſts are framed into girders, as the binding-joiſt has to ſupport the bridging-joiſts, and theſe the floor, the beſt method, in order to give ſtrength to the tenon, is to make a reſt of a ſhort length under the tenon, with a ſloping ſhoulder above, extending in a line from the extremity of the reſt to the perpendicular of the ſquare ſhoulder below at the upper edge of the binding-joiſt. See *fig.* 2. *Plate* LXII. of *Architecture.* No. 1. repreſents a ſection of the girder through the mortiſes; Nos. 2 and 3 part of the joiſts in a longitudinal direction.

When a piece of timber is to be framed between two parallel pieces which are quite immoveable, the true method, in order to make cloſe work, is to make the extremity of the tenon and the bottom of the mortiſe, at one end, in the arch of a circle, having its centre in one edge of the mortiſe, and the extremity of the tenon, and the bottom of the mortiſe at the other end, in a concentric arch from the ſame centre. As the mortiſe at this end muſt be much longer than the breadth of the tenon, there will be a large part of the mortiſe ſtill open, which may afterwards be filled up. Inſtead of the bottom of the mortiſe here being formed in the arch of a circle, it may be cut quite parallel to the edge to the deepeſt part, as it will not impede the tranſverſe piece in going to its place. This mode of framing is much uſed in ceiling, joiſting for double floors: the long mortiſes cut in this manner are called chaſe mortiſes. In forming the tenon and mortiſe, at the end where the centre is placed, it is not neceſſary that the mortiſe and tenon ſhould be ſo deep as to form an entire quadrant; in this caſe the bottom may be quite parallel, and only the further edge oppoſite the centre made circular. *Fig.* 3. *Plate* LXII. of *Architecture* repreſents a piece of framing, in the manner above deſcribed, A B, the bottom of the mortiſe, and the extremity of the tenon deſcribed from the centre C; D E the running, or chaſed mortiſe, which muſt be quite free from the circumference deſcribed by the point D, whether the extremity be in the circumference, or in a tangent, D F, parallel to G E.

The manner of repreſenting the tenon and mortiſe at the end on which the centre is placed, when the mortiſe is made of a leſs depth than the breadth of the tenon, is ſhewn at the other end.

When a tranſverſe piece is to be framed between two parallel joiſts, of which their vertical ſurfaces are oblique to each other, the upper edge of the tranſverſe piece is turned downwards upon the top of the joiſts, and marked at the interval or clear; it is then turned upwards into the poſition in which it is to be placed, the mark at one end is brought into a right line with the vertical ſurface of the joiſt, and a line is drawn by the edge of a rule or ſtraight edge placed vertically in the plane of the joiſt and the tranſverſe piece; this line marks the ſhoulder of the tenon. The other end is drawn in the ſame manner. This mode of framing a tranſverſe joiſt between two parallel joiſts is called by workmen tumbling-in-joiſts. The manner of tumbling in a joiſt is exhibited at *fig.* 4. *Plate* LXII. of *Architecture.* A and B are ſections of the parallel joiſts, C D E F the tranſverſe joiſt, or the piece tumbled in, G H the ſtraight edge placed for drawing the ſhoulder C F.

A piece of timber may be joined at right angles to another in the manner of *fig.* 3. *Plate* LXI. of *Architecture,* which is a longitudinal ſection in the direction of the fibres of both pieces. A mortiſe is cut in the one piece to the breadth of the piece which is to form the perpendicular: the edge of the tenon is cut with a dove-tail notch, ſo that the piece may be at right angles to the other, and a wedge or key is driven from the other edge of the tenon, which forces it quite cloſe. One inconvenience ariſing from the dove-tail is, that if the timber of which it is made be not quite dry, the tenon will ſhrink in proportion to its breadth, and therefore the perpendicular piece will be liable to be drawn to a certain degree. To remedy this defect, inſtead of the edge of the tenon being cut dove-tail ways, it may be notched, as is to be ſeen in *fig.* 4. No. 1. No. 2. ſhews another view of the perpendicular piece with the wedge.

Another method of fixing one piece of timber perpendicular to another, is to mortiſe the piece forming the baſe not quite through, enlarging the edges towards the bottom, and making the tenon of the perpendicular piece to fit the upper part of the mortiſe. Two wedges are then fixed to the bottom of the tenon; where the perpendicular piece is driven, the wedges will be reſiſted by the bottom, which will ſplit the ends of the tenon, and fill up the mortiſe to the breadth at the wideſt place. This mode of fixing one piece at right angles to another is called fox-tail wedging. By this method, ſo long as the wedges are kept from ſlipping, the one piece can never be drawn from the other, without breaking the tenon. In order to enlarge the tenon in breadth ſtill more towards its extremity, two other ſmaller wedges may be put in, of which their ends do not reach quite ſo far as thoſe of the other two, which, when partly driven, the ſmall wedges will then begin to widen the end of the tenon likewiſe, and make it fill the mortiſe completely at the bottom. *Fig.* 5. No. 1. ſhews the edge of the piece on which the mortiſe is cut. Fox-tail wedging is chiefly uſed where the pieces to be put together are ſmall, and then the wedges are frequently driven in with glue; when the pieces to be joined are large, the former method is generally practiſed.

The fixing beams to wall-plates is called cocking or cogging. When a beam is to connect two wall-plates, in order to bind the ſides of the building together, one method is to cut the end of the beam in the form of a dove-tail, and to make a correſponding notch in the wall-plate to receive it, as is ſhewn in *fig.* 6. No. 1. No. 2. is a tranſverſe ſection at the neck of the dove-tail. *Fig.* 7. ſhews the ſame thing, with a ſmall variation in the form of the dove-tail, fitted obliquely to the other piece. But when the timber has not been ſufficiently ſeaſoned, and when it begins to dry, the perpendicular piece may eaſily be drawn from the other, to a certain degree. Therefore, if the ſides of the building are affected by lateral preſſure, this mode of fixing the one piece to the other will not prevent the walls from coming nearer together, or expanding. The moſt effectual method of preventing this is ſhewn at *fig.* 8. No. 1. where a ſmall notch is cut out of the beam, and the contrary parts, viz. a double notch, cut in the wall-plate to receive it. No. 1. the beam ſhewn longitudinally upon a tranſverſe ſection of the wall-plate; No. 2. the upper face of the wall-plate. The beſt method of connecting any number of poſts with croſs-beams depends upon this principle. *Fig.* 9. No. 1. ſhews a tranſverſe ſection of a poſt with two beams longitudinally bolted to it, in the manner of cogging beams to wall-plates: No. 2. a part of one of the beams, ſhewing the notches. The ſtrongeſt method of fixing the purlins of a roof to the rafters alſo depends upon the ſame principle. *Fig.* 10. No. 1. is a ſection of the rafter, with the purlin longitudinally drawn; No. 2. the upper edge of the rafter; No. 3. the under ſide of the purlin, ſhewing the notch.

The method of joining timber laterally, by means of keys and dove-tails, is ingenious, and not generally known; it will be neceſſary to exhibit and deſcribe the manner of doing it *Fig.* 1. *Plate* LXI. of *Architecture,* No. 1. is a longitudinal ſection of two pieces joined in this manner, with the dove-tail pieces and the wedge or key, by means of which they are forced againſt the ends of the pieces to be fixed, and in order to make the one preſs harder to the other, the interior angle of the dove-tails is greater than the exterior one, formed upon the pieces to be joined; No. 2. is a tranſverſe view of the mortiſe, exhibiting the ends of the dove-tails and keys. *Fig.* 2. is the ſame method, applied in joining parallel pieces not touching each other together, which is plain to inſpection.

The modes in which beams are lengthened are of infinite variety; ſome of the moſt approved forms are as follow. A beam may be continued to any extenſion by building it in three thickneſſes; ſee *fig.* 1. *Plate* LX. of *Architecture.* It may alſo be done by ſplicing one to the end of another, called by carpenters ſcarfing, which is of various forms, as in *figures* 1, 2, 3, 4, 5, 6, 7, and 8. When a beam is to be lengthened, as in *fig.* 2. and 3. it is very difficult to get the joints cloſe when the pieces compoſing it are very large, and hence they are ſeldom uſed but for very ſmall pieces, which may be glued together. To remedy this inconvenience in large works, as well as to make it leſs dependent on the bolts; and to prevent every poſſibility of the one being drawn away from the other, is to indent them together, called tabling, as in *figures* 4, 5, 6, 7, 8, and 9, and to leave a ſmall ſpace at the end or meeting of each table for a wedge. In the operation of joining timbers in this manner, the pieces are laid ſo as to bring the joint as cloſe as poſſible, the wedge is then driven while another perſon ſtrikes the extremity of one of the pieces with a large hammer or mallet, which will bring the joint quite cloſe, if they have been well fitted together previouſly to the operation; of theſe two forms, *figures* 5, 6, and 7 ought to have the preference, as the faces of the tables are parallel to the fibres of the wood, which will make them reſiſt any longitudinal ſtrain with a much greater force; but as a diſadvantage ariſes from this form, that more than half the wood is cut quite through at the two ends of the joints, it has been found neceſſary to fix plates of iron acroſs them, as are ſhewn. However, there is leſs to be apprehended from the tearing of the fibres, by being drawn in a direction of their length, than from the bending of the bolts.

*Fig.* 6. is a ſcarfe with ſeveral tablings; in this it is to be obſerved, that the wedges in the two extreme mortiſes are only effective. A wedge in the middle would tend to force the joints open, and therefore the other two ſhould only be fixed. Long ſcarfings add to the ſtrength; but to increaſe the number of tables more than two, is, it is thought, rather diſadvantageous, as it ſhortens its fibres, and conſequently makes their reſiſtance leſs. *Fig.* 7. is an excellent method of ſcarfing in two pieces, each piece being tabled together, as in *fig.* 5. It has been thought by ſome that tabling ſcarfings leſſen the ſection of reſiſtance more than is neceſſary; and for this purpoſe they prefer *fig.* 8. with an oblique ſcarf, where the keys are let half into the one and half into the other: but in this mode, as a draught muſt be left for the keys, they will be apt to be turned round in the driving, and therefore will have leſs effect in keeping the pieces together. *Fig.* 9. is a mode of ſcarfing a beam by tabling the pieces together; No. 1. and 2. are the two halves; when bolted together they have the appearance of being quite ſtraight, as is ſhewn in No. 6. The tables are made in the form of obtuſe angles, with a ridge in the middle, depreſſed and raiſed alternately, in the form of re-entering and ſalient angles; No. 3. ſection acroſs the depreſſed part; No. 4. ſection acroſs the raiſed part; No. 5. ſection of the beam when bolted together. In all forms of ſcarfing whatever, every butting joint ſhould be ſtrapped acroſs with iron on both ſides; this will in a great degree prevent the bolts from being bent, and will increaſe the longitudinal reſiſtance at the weakeſt ſection. If a beam is to be ſcarfed and tabled as in this laſt mode, the utmoſt care ought to be taken in the workmanſhip, ſo that all the butting-places ought to be cloſely fitted together.

Connected with ſcarfing is the method of joining timbers, which may either be endways, ſideways, perpendicularly, or obliquely. When two pieces of timber are ſo joined that the common ſeam or joint is perpendicular to the fibres of both pieces, then the joint is ſaid to be butting, and is called by workmen a butting or heading joint. When two pieces of timber are joined together, ſo that the common ſeam is parallel to the fibres of both pieces, this then may be called lateral or longitudinal joining, and the joint may be called a longitudinal joint, as it runs in the direction of the grain; and when the fibres and ſeam of the one piece run perpendicular to the fibres of the other, this mode of joining timbers may then be called tranſverſe joining, and the joint may be called a tranſverſe or perpendicular joint. Laſtly, when the fibres of the one piece run obliquely to thoſe of the other, this is called oblique joining, and the joint is called an oblique joint.

Butting joints for many purpoſes are preferable to ſcarfings, particularly in ſmall work, ſuch as the hand-rails of ſtairs.

They are fixed together with bolts, having a ſcrewed nut at each end, the head of one of theſe nuts muſt be quite round and the other ſquare; the round one muſt be cut in its circumference full of notches. After having let in the bolt perpendicularly to the joint in both pieces, the nuts are ſunk from one ſide acroſs the grain, until the ends of the bolt may be able to paſs the interior ſcrew made on purpoſe to receive the exterior one; the ſquare nut is firſt put in and the one end of the bolt is firmly driven into the bore made on purpoſe to receive it, and ſcrewed to the nut. The other notched nut is then put in, and the bolt in its place; the one piece may be turned round upon the other until the joint is cloſe, but in order to ſecure the joint from turning round, two dowels may be inſerted on each ſide of the bolt. Drive the one piece as cloſe to the other as the nut will permit. Then by means of a narrow pointed ſcrew-driver and mallet, the nut may be turned round until the joint is quite cloſe.

*Fig.* 5. *Plate* LXII. of *Architecture* repreſents the meeting of a pair of rafters and the king-poſt, together with the manner of ſtrapping them. This mode of forming a junction by making the rafters meet each other, without the intervention of the joggle-head, which is generally made to the king-poſt, has the advantage over the common mode with a joggle-head, exhibited in *fig.* 6. *Plate* LXII. of *Architecture*, as the ſhrinking of the king-poſt at the joggle will allow the roof to deſcend, and conſequently put it out of ſhape.

One method of ſtrapping the tie-beam to the king-poſt is exhibited at *fig.* 7. *Plate* LXII. of *Architecture*. The mortiſe of the ſtrap on both ſides is made oblong, and that through the king-poſt is made ſomewhat lower, in order to give the wedges a proper draught. An idea may be formed by examining No. 1. which repreſents the bottom of the king-poſt with part of the tie-beam; No. 2. is a longitudinal ſection of the king-poſt, with a tranſverſe ſection of the beam, in the upper part of this is ſhewn the manner of fixing the wedges, with the form of the waſhers, which are neceſſary in preventing the ſtrap on each ſide from penetrating into the wood, the whole force of the friction being taken away from the ſtraps by them. Another mode of fixing the tie-beam to the king-poſt is by a bolt, as exhibited at *fig.* 8. *Plate* LXII. of *Architecture*. No. 1. ſhews the elevation of the bottom of the king poſt; No. 2. is a vertical ſection cutting the beam tranſverſely; in order to give greater ſecurity, there are two nuts, one let in from the face of the beam and the other from the edge. *Fig.* 1. *Plate* LXIII. of *Architecture* ſhews the meeting of a brace and ſtraining-piece under a truſs-beam, as the brace may be reſolved into two forces, one puſhing in a direction of the beam, that is, compreſſing the ſtraining-piece, and the other tending to break it tranſverſely, the end of the brace is cut in the form of a ſally, or bird's mouth, as it is called by workmen. Another method is ſhewn at *fig.* 2. *Plate* LXIII. of *Architecture*. This mode is uſed in the roof of Greenwich chapel. See the figures in the article Roof. It may, however, be obſerved, that this abutment is not of the beſt kind; the ſpace left for the brace to give preſſure to the ſtraining-piece is much too ſmall; the upper part ſhould not be let into the ſtraining or truſs-beam, this prevents the ſtraining piece from acting with its full force, and weakens the truſs-beam.

*Fig.* 3. *Plate* LXIII. of *Architecture* ſhews the method of ſecuring a collar-beam, at one extremity, to its adjacent rafter, in order to prevent its being pulled away at the joint, a bolt is made to paſs through the rafter at the angle of their meeting.

Beſides what has already been ſhewn of the hanging of king-poſts to their principal rafters, *fig.* 4. *Plate* LXIII. of *Architecture* is another. The rafters meet each other as in *fig.* 5. *Plate* LXII. of *Architecture*, but inſtead of the forked ſtrap, a bolt is here uſed, with a ſpreading head, ſo as to form a ſhoulder at right angles to the rafters, which are notched, in order to receive the bolt. This alſo prevents the rafters of a roof from ſinking in the middle. Inſtead of any part being of wood, the whole may be of iron, conſiſting of two parts, connected together by means of a ſcrew, which will draw the tie-beam higher and higher at pleaſure as it is turned round. No. 1. part of the king-poſt with the bolt; Nos. 2. and 3. part of the rafters; No. 4. view of the upper edge of the rafters. Various forms are ſometimes adopted for the abutments at the bottom of the king-poſt; for the braces, when the king-poſt is not ſufficiently broad at the bottom, as to allow the abutting ſhoulder to be at right angles to the length of the brace, and to its whole breadth. Two of the moſt approved forms are exhibited in *figures* 5 and 6. *Plate* LXIII. of *Architecture*. *Fig.* 5. ſhews the form of the abutment, when the part which makes the reſiſtance in the direction of the king-poſt is at right angles to it. *Fig.* 6. ſhews the form of the abutment, when the part of the ſhoulders which makes the reſiſtance is at right angles to the brace; this mode is better than the former, becauſe it is leſs liable to compreſs the king-poſt at the bottom.

*Fig.* 7. *Plate* LXIII. of *Architecture* repreſents one form of the heel of a principal rafter, with the ſocket cut in the end of the tie-beam to receive it; but as the ſmall part cut acroſs the fibres of the beam is ſo near to the extremity, and as this part ſuſtains the whole force of the rafters, in drawing the beam in a direction of its length, it will be liable to be forced away. To prevent this in ſome meaſure, a double reſiſtance is formed, as in *fig.* 8. *Plate* LXIII. of *Architecture*, equally deep into the beam; this mode gives the ſtrength of the intermediate part contained between the two abutments, in addition to the end reſiſtance, which is of itſelf equally ſtrong with that repreſented in *fig.* 7. The intermediate part in this mode being cut acroſs the fibres, it is eaſily ſplit away. A more effectual method of forming a double reſiſtance is ſhewn at *fig.* 9. *Plate* LXIII. of *Architecture*, where the heel of the rafter and the ſocket is cut parallel to the fibres of the beam; the tenon forms the ſecond abutment, being removed farther from the extremity. No. 1. the elevation of part of the rafter with part of the beam; No. 2. the upper edge of the beam, ſhewing the mortiſe. But the moſt effectual mode of forming a reſiſtance on the heel of the rafter and ſocket on the extremity of the beam is that repreſented by *fig.* 10. *Plate* LXIII. of *Architecture*, where the abutment is brought nearer to the inner part of the heel, which leaves a greater length on the end of the beam, in order that the reſiſtance may ſtill be greater than what is given by the wood. A ſtrap may be placed round the extremity of the rafter, and the two ends bolted together through the beam, as is ſhewn by this diagram at No. 1. and 2.

*Fig.* 11. *Plate* LXIII. *Architecture* repreſents two braces of a roof meeting an iron king-poſt, which is only a ſmall rod of iron ſufficiently ſtrong to hang up the middle of the beam, and to receive the force of the braces by the weight of the middle rafters. The ſtrap which prevents the braces from being puſhed downwards, has an eye through each ſide, and the bottom of the king-rod is formed with a croſs equal in length to the thickneſs of the braces; this croſs is perforated in its length to receive the bolt.

The purpoſes for which wood is employed in modern buildings, and particularly in thoſe of England, are very various. It is uſed to form the frame work of the roof, and in laths or boarding, to ſupport the covering of tiles, ſlates, &c. Long pieces, called *bond* or *chain* timber, are laid in the walls to ſtrengthen and bind them together: other flat pieces, called *plates* or *wall plates*, are placed to receive the ends of the girders, joiſts, and other timbers, which form the framing of the floors, and afford them a level bed. *Ties* are placed acroſs the building to aſſiſt in keeping the oppoſite walls in their ſituation, and counteract the lateral preſſure of the roof, and diagonal ties at the angles. *Lintels* are laid over the apertures of doors or windows to ſupport the incumbent walls. The floors are framed with various beams and joiſts. The rooms are divided with *quarter partitions*, being a frame work of ſmall poſts and horizontal and diagonal pieces placed at about a foot aſunder, and deſtined to be caſed with lath and plaſter on the outſide. Door and window-frames are alſo placed in the apertures of the walls. In bad foundations piles are ſometimes uſed; and ſometimes planking, and what are called *ſleepers*, pieces of timber, laid at ſhort intervals traſverſely, beneath the foundation wall, and extending about two feet wider: beſides all the finiſhing wood work, ſuch as doors, windows, wainſcoting, &c. which belongs to joinery. Carpentry is alſo employed to conſtruct the centres for arching and vaulting, and frequently in entire bridges. Coffer dams, caiſſons, flood-gates, and all the methods of building in water, derive large aſſiſtance from this art.

The general principles of meaſuring and valuing carpenter's work may be given very ſhortly; and to enter into minutiæ would be ſuperfluous in the preſent work. The timber uſed for building in London, and in the greateſt part of England, conſiſts entirely of oak and fir; the firſt the growth of this country, the ſecond imported chiefly from Norway. That timber which is out of ſight, as being covered with lath and plaſter or other facing at the completion of the building, which is by much the greater part, is uſed as it comes from the ſaw, without the operations of the plane. Of this, part is framed as the roof, floors, partitions. The quantity is meaſured by the cubic foot, and either valued as *fir framed*; or elſe the quantity of timber being aſcertained, is put down as fir without labour, *(fir no labour)* in the valuation of which is included the original price of the timber, with the expence of cartage, ſawing, waſte, and the profit to the carpenter; and a ſuperficial dimenſion is taken of the frame or ſpace in which the timber was employed under the denomination of *labour* and *nails*, to a floor of ſuch a kind, roof, quarter partition, &c. in which is eſtimated the value of the workmanſhip, with the maſter's profit. The choice between theſe two methods is influenced by cuſtom, and the convenience of the meaſurer. The timber uſed in the walls, as the plates, and bond timber, is meaſured ſeparately by the cubic foot, and put down under the denomination of *fir in bond*: this is valued at a medium price between fir framed, and fir without labour. As for the timber which remains apparent after the completion of the building, it is generally worked in ſome manner with the plane, and is meaſured by the cubic foot, and denominated and valued according to the workmanſhip; thus a doorcaſe is *framed*, *wrought*, *rebated*, and *beaded*. We have mentioned only fir becauſe it is infinitely more uſed than oak, however the latter is meaſured in the ſame way.

Boarding, ſuch as weather-boarding, boarding for ſlates, &c. is meaſured by the ſuperficial foot, and valued in the bill by the ſquare, or 100 ſuperficial feet. Timber uſed in very ſmall ſcantlings, as fillets, is valued, not by the cubic or ſuperficial foot, but by the foot in length, called foot run.

Having thus deſcribed what is properly included under the general head of carpentry, the reader is referred, for more particular information, to the articles Centre, Floor, and Roof; under which articles that part of conſtructive carpentry which depends on certain branches of mechanics and geometry will be fully explained.

CARPENTUM, in *Antiquity*, a denomination common to divers ſorts of vehicles, anſwering to coaches as well as waggons, or even carts among us: ſometimes on two and ſometimes on four wheels; and ſometimes covered, and at other times uncovered.

The carpentum was originally a kind of carr or vehicle wherein the Roman ladies were carried; though in after-times it was alſo uſed in war. The form of this carriage may be ſeen on antique coins, where it is repreſented as a two-wheeled carr, with an arched covering, and it was ſometimes hung with coſtly cloth. It was a later invention than the *lectica*, and the *arcera* mentioned in the 12 tables, which was a covered carriage uſed by ſick and infirm perſons.

Some derive the word carpentum a *carro;* others from *Carmenta*, mother of Evander, by a converſion of the *m* into *p*, *carpentum* for *carmentum*. Thus Ovid, Faſt. lib. i.

"Nam prius Auſonias matres Carpenta vehebant
Hæc quoque ab Evandri dicta parente reor."

CARPENZANO, in *Geography*, a town of Naples, in the province of Calabria Citra; 10 miles S. of Coſenza.

CARPERA, in *Ichthyology*, a name given by Cuba, and ſome other writers on fiſhes, to the common carp, cyprinus carpio.

CARPESIA, in the *Materia Medica of the Ancients*, a name given to a kind of ſpice, or aromatic drug, often mentioned by Ægineta and others, and made an ingredient in cordial and ſtomachic medicines. This was a vegetable ſubſtance, being the top ſhoots of young twigs of an odoriferous ſhrub, growing in Pamphylia, and ſmelling very like the fineſt cinnamon.

As the ancients uſed both this drug and cubebs, it is certain that had they both been the produce of the ſame tree, they muſt have known it; and this it is plain they did not know, for they have no where named any ſuch thing; but, on the contrary, they have expreſsly ſaid, that the *carpeſia* was the ſhoots of a tall tree, which produced no fruit. Avicenna gives alſo this account, and adds, that it grew, in his time, on mount Lebanon, and that the part gathered for this uſe was certain twigs, very long, cylindric, and but little thicker than a needle, which had a very fragrant ſmell.

CARPESIUM, in *Botany*, (Καρπησιον, Galen.) Linn. gen. 948. Schreb. 1284. Willd. 1478. Juſſ. p. 184. (Conyzoides; Tourn.) Claſs and order, *ſyngeneſia polygamia ſuperflua*. Nat. Ord. *Compoſitæ diſcoideæ*, Linn. *Corymbiferæ* Juſſ.

Gen. Char. *Cal. common*, imbricated; outer ſcales larger, ſpreading, reflexed; inner ones equal, cloſe, ſhorter. *Cor. compound*, equal; florets hermaphrodite in the diſk, funnel-ſhaped; border five-cleft, ſpreading; female in the circumference, tubular, five-cleft, converging. *Stamens* filaments five, ſhort. *Piſt.* ſimilar in both kinds of florets; germ oblong; ſtyle ſimple; ſtigma bifid. *Seeds* inverſely egg-ſhaped, naked. *Recep.* naked.

Eſſ. Char. *Receptacle* naked. *Down* none. *Calyx* imbricated; outer ſcales reflexed.

Sp. 1. C. *cernuum*, Linn. Sp. Pl. Jac. Auſt. tab. 204. Lam. Illuſt. Pl. 696. fig. 1. (After cernuus; Colum. Ecphr 1. tab. 252. Barrel. ic. 1142. Conyzoides flore flaveſcente; Tourn. Chryſanthemum conyzoides, Moriſ. hiſt. 3. tab. 5. fig. 26.) "Flowers terminal, ſolitary, nodding." Willd. *Root* perennial, Willd. Lam. biennial, Mil. *Stem* a foot and half high, branched, leafy, cylindrical, villous. *Leaves* alternate, oval-lanceolate, ſlightly ſerrated, narrowing at their baſe, cloathed with ſhort hairs. *Flowers* yellowiſh; peduncle thicker at the top, with four or five unequal, lanceolate bractes ſituated at the baſe of the calyx. A native of moiſt ground in Italy, Switzerland and Provence. 2. C. *abrotanoides*, Linn. Sp. Pl. Oſbeck it. tab. 10. Lam. Illuſt. 696. fig. 2. "Flowers axillary, generally ſolitary." *Root* perennial. *Stem* branched, rather hard. *Leaves* alternate, broad-lanceolate, ſlightly crenate, leſſening into a petiole, about the length of a finger. *Flowers* ſeſſile, or on very ſhort peduncles, about the ſize of a hazel nut, nodding; calyx umbilicated, ſurrounded by ſpreading leaflets; florets numerous; ſeeds oblong, naked, ſmooth, ſmeared with a kind of balſam. A native of China.

CARPESIUM, in *Ancient Geography*, a mountain of Aſia, in Pamphylia.

CARPESTRIERA, in *Geography*, a river of Italy, which runs into the ſea; 9 miles E. of St. Severino.

CARPET, a ſort of covering, worked either with the needle, or on a loom; to be ſpread on a table, trunk, an eſtrade, a paſſage, or a floor.

Perſian and Turkey carpets are thoſe moſt prized; eſpecially the former, for which there is a manufacture at Paris: carpets that had a hair or ſhag on one ſide only, were called by the ancients *tapetes*; ſuch as had a ſhag on both ſides, were called *amphitapetes*. Engliſh *carpets*, eſpecially thoſe of AXMINSTER, (which ſee) and thoſe, the manufacture of which was eſtabliſhed in London by the late Mr. Moore, are much valued. For a further account of this manufacture, ſee TAPESTRY.

Among *Jockeys*, to *ſhave the carpet*, is to GALLOP very cloſe, or near the ground; a fault foreigners charge on Engliſh horſes.

Figuratively, an affair, propoſal, &c. are ſaid to be brought on the *carpet*, or tapis, when they are under conſideration, &c.

CARPET-*knights*, a denomination given to gown-men, and others, of peaceable profeſſions, who, on account of their birth, office, or merits to the public, or the like, are, by the prince, raiſed to the dignity of knighthood.

They take the appellation *carpet*, becauſe they uſually receive their honours from the king's hands in the court, kneeling on a carpet. By which they are diſtinguiſhed from knights created in the camp, or field of battle, on account of their military prowefs.

Carpet-knights poſſeſs a medium between thoſe called *truck*, or *dunghill-knights*, who only purchaſe, or merit the honour by their wealth; and *knights bachelors*, who are created for their ſervices in the war.

CARPET-*way*, in *Agriculture*, a term applied to a green plat or path left unploughed up in an arable field; or, in common fields, to ſuch ſtrips as ſerve for diviſions.

CARPETANI, in *Ancient Geography*, a people of Hiſpania Citerior, ſituate on the W. towards Luſitania. Their principal towns were Complutum, Contrebia, Mantua, and Toletum. Ptolemy aſſigns to them 18 towns.

CARPETANIA, a country of Spain, in which Pliny places the towns of Contrebia and Hippona; and where this author, and alſo Ptolemy, place Oebura. The mountains of Carpetania are denominated by Pliny "Carpetana juga;" and he ſays that the chief town was Contrebia.

CARPHALEA, in *Botany*, (from Καρφαλεος, dry.) Lam. Illuſ. 155. Pl. 59. Juſſ. p. 198. Claſs and order, *tetrandria monogynia*, Linn. Nat. Ord. *Rubiaceæ*, Juſſ.

Gen. Ch. *Cal.* ſuperior, four-leafed; leaflets ovate, veined, ſcarious, permanent. *Cor.* funnel-ſhaped; tube long, ſlender, ſwelling near the top, hairy within; border four-cleft; lobes acute. *Stam.* Filaments four, very ſhort, inſerted within the tube; anthers linear, erect. *Piſt.* Germ. inferior; ſtyle briſtle-ſhaped, longer than the corolla; ſtigma bifid. *Peric.* Capſule crowned with the calyx, two-celled, two-valved, many-ſeeded; partition oppoſite to the valves, ſplitting into two. *Seeds* unknown. Eſſent. Ch. *Calyx* ſuperior, four-leafed, ſcarious. *Corolla* tubular. *Capſule* crowned with the calyx, two-celled, many-ſeeded.

Sp. C. *Madagaſcarienſis*. "Leaves oppoſite, linear-lanceolate; flowers in a corymbus." An arid ſhrub, with leaves like thoſe of hyſſop, and terminal flowers in a denſe corymbus or rather cyme. In La Marck's figure the younger branches are leafy, the older ones naked; and one of the younger branches there repreſented has a ſingle pair of oppoſite leaves near the top, and three ſets of ſix or ſeven in a whorl below; the other has five pair of oppoſite leaves, and appears rough near the bottom with the ſcars of the fallen whorls. Found by Comerſon in the iſland of Madagaſcar. Juſſieu obſerves that it has the habit of Seriſſa and the calyx of Petræa.

CARPI, UGO DA, in *Biography*, flouriſhed in 1500, and was leſs celebrated as a painter than in other reſpects. The Italians have aſcribed to him the honour of having been the firſt engraver on wood; but though this be not true, his claim to the invention of that ſpecies of engraving on wood, diſtinguiſhed by the name of chiaro-ſcuro, in imitation of drawing, appears to be better founded. For this purpoſe he cut the outlines on one block of wood; the dark ſhadows upon a ſecond; and the light ſhadows or half tint upon a third. The firſt being impreſſed upon the paper, the outlines only appeared: this block being removed, the ſecond was put in its place, and being alſo impreſſed upon the paper, the dark ſhadows were added to the outlines; and the third block being put in the ſame place, upon the removal of the ſecond, and alſo impreſſed upon the ſame paper, made the demi-tints; and the print was completed. In ſome few inſtances the number of blocks was increaſed, and being applied in the ſame manner, the print received an impreſſion from every block. His prints, though ſlight, are uſually very ſpirited, and wrought in a very maſterly ſtyle. Out of the great number which he engraved, we ſhall mention the following: viz. "A Sibyl reading in a book, with an infant holding a flambeau to light her;" "The burning of Troy, with Æneas ſaving his father Anchiſes;" "A deſcent from the croſs;" "David cutting off the head of Goliah;" all from Raphael; and a "Magician ſeated on the ground, with a book open before him, and in the back-ground a bird with its feathers plucked off," from Parmigiano. This ſpecies of engraving was carried to great perfection by Andrea Andriani, (ſee his article,) and alſo by Balthaſar Perezzi of Siena, and Parmigiano. Strutt. Pilkington.

Carpi, Girolano da, a painter of portrait and hiſtory, was born at Ferrara in 1501, and ſtudying under Gærofalo, had become the beſt artiſt among his diſciples. He afterwards ſtudied the works of Correggio, and for this purpoſe ſpent ſeveral years at Parma, Modena, and other cities of Italy, where the beſt of his works are preſerved. Such was his ſucceſs in the imitation of this eminent maſter's ſtyle, that many paintings, copied by Carpi from his pictures, were taken for originals, and eagerly purchaſed by connoiſſeurs. It is preſumed that at this day ſeveral of the paintings of Carpi paſs for the genuine productions of Correggio. He died in 1556. Pilkington.

Carpi, in *Ancient Geography*, a people of Valeria, according to Ammianus Marcellinus, tranſplanted by Diocleſian into Lower Pannonia, and placed in the vicinity of the Iſter. The mountains called "Carpates," were probably the firſt habitation of this people, who abandoned it under the empire of Alexander.

Carpi, a town of Proconſular Africa, according to Pliny, called Carpis by Ptolemy, and placed by him one third of a degree more northerly than Carthage; to this city pertained an epiſcopal ſee, noticed in the conference at Carthage. Dr. Shaw (Travels p. 87.) ſuppoſes the ſpot which this town occupies to be that which "Gurbos" or "Hammam-Gurbos" now ſtands upon; and that the hot-bath near it is the "Aquæ Calidæ" of Livy (l. xxx. 24.) which he places over againſt Carthage; informing us, that ſeveral veſſels belonging to the fleet of Octavius were here ſhipwrecked.

Carpi, in *Geography*, a ſtrong town of Italy, and capital of a principality in the duchy of Modena; taken by the French and abandoned in 1703, taken again by them in 1705, and retaken by prince Eugene in 1706: the ſee of a biſhop, ſuffragan of Bologna; 7 miles N. of Modena. N. lat. 44° 45′. E. long. 11° 12′.

Carpi, a town of Italy, in the Veroneſe, ſituate on the Adige, and ſubject to the Venetians; famous for a victory obtained by prince Eugene over the French in 1701. N. lat. 45° 10′. E. long. 11° 39′.

Carpi *extenſor radialis, longior et brevior*, in *Anatomy*, are two muſcles, which ariſe cloſe to each other from the lower extremity of the os humeri: the latter having its origin from the external condyle, and the former from the outer margin of the bone, immediately above the condyle. They are cloſely connected together, lie immediately on the radius, and paſs under the extenſor tendons of the thumb. Their tendons run in a groove of the inferior extremity of the radius, where they are ſurrounded by a burſa mucoſa, and then ſeparate from each other; the longer muſcle being inſerted into the metacarpal bone of the fore finger, and the ſhorter into that of the middle finger.

The action of theſe muſcles conſiſts in drawing the back of the hand towards the outſide of the fore arm, which motion is termed by anatomiſts, the extenſion of the wriſt.

When the radius is prone, or ſupine, they will bring it into the middle ſtate between theſe poſitions. The longer muſcle may aſſiſt in bending the elbow.

Winſlow, Albinus and Soemmerring call theſe muſcles "Radiales externi, longior et brevior."

Carpi *extenſor ulnaris* ariſes in common with ſome other muſcles from the external condyle of the humerus, and from the upper part of the ulna. Its tendon, which commences about the middle of the fore arm, is bound down at the back of the ulna by a tendinous burſa mucoſa, and is affixed to the metacarpal bone of the little finger. It extends the joint of the wriſt, and may aſſiſt in turning the hand ſupine. This muſcle is the ulnaris externus of ſeveral anatomiſts.

Carpi *flexor radialis* ariſes in company with the pronator teres, flexor ſublimis, flexor carpi ulnaris, &c. from the inner condyle of the humerus. It paſſes obliquely acroſs the ulna, and forms a tendon towards the wriſt, which penetrating a canal on the os naviculare is fixed to the metacarpal bone of the index. It moves the palm of the hand towards the front of the radius and ulna, or in anatomical terms bends the wriſt. It turns the radius into the prone poſition. Winſlow, Albinus, &c. call this muſcle "radialis internus."

Carpi *flexor ulnaris* ariſes by a common origin with the neighbouring muſcles from the internal condyle of the humerus, and alſo from the margin of the ulna. It paſſes over this bone, receiving fibres all the way to the wriſt. Its tendon is inſerted into the os piſiforme of the carpus. It bends the wriſt. It is called by many anatomiſts "ulnaris internus."

This muſcle concurs with the extenſor carpi ulnaris in producing a lateral motion of the wriſt, in which the ulnar ſide of the hand is moved towards the ulna. The extenſores carpi radiales and the flexor carpi radialis draw the radial ſide of the hand towards the radius. When the wriſt is bent, or extended without any inclination to either ſide of the fore arm, the effect is produced by the combined action of the radial and ulnar flexors or extenſors.

CARPIANI, in *Ancient Geography*, a people of European Sarmatia, who, according to Ptolemy, inhabited the diſtrict between the Peucini and the Baſterni.

CARPIGNANA, in *Geography*, a town of Italy, in the Novareſe; 12 miles N.W. of Novara.—Alſo, a town of Naples, in the province of Otranto; 7 miles N.W. of Otranto.

CARPINUS, in *Botany*, (a Latin radical) hornbeam, or hardbeam tree, French charme, charmille. Tourn. p. 582. Linn. Gen. 1073. Schreb. 1449. Juſſ. p. 409. Gært. 556. Claſs and order, *monæcia polyandria*. Nat. ord. *Amentaceæ*. Linn. Juſſ.

Gen. Ch. *Male flowers* in a cylindrical ament or catkin.

*Scales* looſely imbricated, ovate, concave, acute, often villous or ciliated, one-flowered. *Cor.* none. *Stam.* filaments about ten, very ſhort; anthers didymous, compreſſed, villous at the tip

*Female flowers* in a ſquarrous, looſe, pendulous ament. *Scales* oblong, entire, or divided, a little villous. *Cor.* none. *Piſt.* germ two-celled, compreſſed, with the rudiments of two ſeeds, but one generally abortive; ſtyles two, filiform. *Peric.* nut one celled.

Eſſ. Char. Male. *Scale* of the ament roundiſh. *Cor.* none. *Stamens* from eight to twenty. Female. *Scale* of the ament oblong. *Cor.* none. *Germ* two-celled. *Nut* one or two-celled.

Species, 1. C. *Betulus*, Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Ill. Pl. 780. Gært. tab. 89. fig. 2. Duham. Arb. tab. 49. (Oſtrya fructu in umbilicis foliaceis, Bauh. Pin. 427. Raii Syn. 451.) "Scales of the ſtrobiles flat." Linn. "Strobiles leafy, looſe; ſcales deeply trifid; lobes lanceolate, the middle one longeſt." Lam. A tree, ſometimes ſixty or ſeventy feet high, but ſlender in proportion to its height, never encreaſing to much more than a foot in diameter. Its moſt common height, in the woods of Picardy and Flanders, is from forty to fifty feet. *Trunk* tolerably ſtraight, but often imperfectly cylindrical; bark even, whitiſh, marked with grey ſpots; branches numerous. *Leaves* about three inches long and two broad, alternate, petioled, ovate, acuminate, doubly ſerrated, ſmooth, wrinkled above, with ſtraight and parallel veins below, remaining on the tree in a withered ſtate during the whole winter. *Male catkins*, about an inch long, lateral, ſolitary, appearing in ſpring a little before the leaves; ſcales ferruginous, concave, ciliated. *Female catkins* terminal, ſolitary, peduncled, looſe; ſcales green, ſmooth, with three lanceolate lobes, of which the middle one is largeſt; nut ſmall, ovate, lenticularly compreſſed, ſtriated, with longitudinal, filiform ribs; crowned with ſix, or, according to Scopoli, four teeth, ſeated at the bottom of the permanent enlarged ſcale. A native of woods in many parts of Europe. There is a variety with pinnatifid-angular leaves. 2. C. *orientalis*, Lam. ii. Cor. 40. (C. betulus, β. Mart. Mil.) "Strobiles leafy, ſhort; ſcales dilated, ſerrate-angular, nerved, flat, abbreviated on one ſide." A tree, from eighteen to twenty feet high. *Trunk* rather crooked and knotty, with a brown or greyiſh bark; branches finely divided, often pubeſcent towards the ſummit. *Leaves* ſmaller than thoſe of the preceding ſpecies, leſs wrinkled, on villous petioles, falling off before winter. *Male catkins* from ſix to eight lines long, ſolitary; ſcales ſmooth; anthers bearded. *Female catkins* ſhort, villous, whitiſh; ſcales not three-lobed as in the preceding ſpecies, but irregularly dilated, flat, nerved, angular, and toothed. *Nut* very ſmall, crowned with teeth. A native of the Eaſt. 3. C. *duinenſis*, Mart. 4. Scop. Carn. 1190. tab. 60. "Scales ſubcordate, doubly toothed; female ament ovate." About two fathoms high. *Trunk* ſoon dividing into branches. *Leaves* ovate-acuminate, doubly ſerrated, ſmooth, hardiſh, on ſhort petioles, with two deciduous ſtipules at the baſe. *Female aments* a little longer than the leaves; ſcales imbricated, ovate or ſemicordate, hard, inflexed on one ſide to the baſe; germ covered by the flexure of the ſcale, not ſtriated as in C. Betulus, gloſſy, crowned with five teeth. A native of Carniola. 4. C. *oſtrya*, hop hornbeam, Linn. Sp. Pl. 2. Mart. 2. Lam. 3. (Oſtrya fructu lupino ſimili, Bauh. Pin. 427. Oſtrya italica, Mich. Gen. 223. tab. 104. fig. 1, 2. Scop. Carn. 1191.) "Scales of the ſtrobiles inflated." Linn. "Strobiles reſembling thoſe of the hop, ovate; leaves ovate-acute; buds obtuſe." Lam. In general habit reſembling the common hornbeam, but ſmaller. *Leaves* leſs wrinkled, ovate, acuminate, doubly toothed, with ferruginous nerves. *Male catkins* long, pendant, faſciculated; filaments branched; anthers emarginate. *Female catkins* reſembling thoſe of the hop; ſcales inflated, cloſed on every ſide, villous at the baſe; nut two-celled, not crowned with teeth, hard, ſmooth, conical. A native of Italy and Germany. 5. C. *virginiana*, Miller, Lam. 4. Pluk. Phyt. tab. 156. fig. 1. "Strobiles reſembling thoſe of the hop, long; leaves ovate oblong, acuminate; buds acute." Lam. Perhaps only a variety of the former, as Linnæus and Duhamel conſidered it, differing chiefly in the ſize and form of the leaves, and the length of the female catkins. Its fruit is exactly ſimilar. Lam. According to Miller it is about thirty feet high, and of quicker growth than the other ſpecies, ſhedding its leaves in autumn, about the ſame time with the elm, and reſembling the long-leaved elm more than the hornbeam. A native of Virginia and Canada.

Obſ. Authors differ much from each other in deſcribing the ſtructure of the female flower. Linnæus aſcribes to it a one-leafed, ſix-cleft, calyx-ſhaped corolla, with two of the ſegments larger than the reſt. La Marck gives it a one-leafed, ſomewhat campanulate, ſix-cleft, ſuperior calyx; and Gærtner adopts the ſame idea. Juſſieu, as we apprehend, juſtly doubts whether the teeth, which crown the germ, conſtitute a proper calyx, and whether the germ ſhould not rather be conſidered as naked and ſuperior, like all the others of its natural family. As this part, or appendage, is wanting in the laſt two ſpecies, it muſt be excluded from the generic character, or, as La Marck propoſes, thoſe two ſpecies muſt form a diſtinct genus. Juſſieu alſo is inclined to ſeparate them from carpinus, not however, on account of theſe teeth, but of the inflated ſcales, which he thinks ſhould rather be called follicles of the branched filaments, of the emarginate anthers, and of the two-celled nut.

*Propagation and Culture.* The common hornbeam is valued as a timber tree in France and Germany. Its wood is hard and tough, and is an excellent material for wheel-cogs, ſcrew-preſſes, heads of beetles, handles of working tools, and other purpoſes in which ſtrength is required. Mr. Evelyn recommends it alſo for turners' uſe: but M. Feuille, a French writer, aſſerts, that it is too brittle for cabinet work. Its trunk, according to him, is ſeldom regularly grained, and ſtill more rarely well rounded. The texture of its fibres is ſingular: its annual layers are not uniformly circular as in the other trees, but aſſume an undulated or zig-zag form; and its tranſverſe fibres, which paſs from the circumference to the centre, have conſiderable intervals between them; the wood is conſequently refractory under the workman's tool, and apt to break into ſplinters. It is alſo in great requeſt abroad as a durable fuel, producing a vigorous flame, and yielding a powerful heat. In England it is ſaid, by Mr. Evelyn, to be moſt abundant in Hertfordſhire, and to be rare weſtward; but, as Mr. Miller obſerves, it is ſeldom ſuffered to grow as a timber tree, being generally reduced to a pollard by the country people. The largeſt and the loftieſt we have ever ſeen are in Bramham park, between Leeds and Tadcaſter, in Yorkſhire, where they form a part of thoſe ſtately clipt avenues which diſtinguiſh that curious ſpecimen of ancient ornamental gardening. The pleaſing verdure and luxuriance of its foliage, and its ready ſubmiſſion to the ſhears of the gardener, ſtrongly recommended it to our formal anceſtors as admirably fitted for eſpalier hedges, and cloſe plantations intended to ſhelter tender perennial exotics. The property of preſerving its withered leaves through the winter, which it poſſeſſes in common with the beech, and which honeſt Evelyn, attentive only to beautiful effect, reluctantly calls an infirmity, makes it eminently proper for the laſt mentioned purpoſe. Our venerable dendrologiſt ſpeaks with rapture of the eſpalier hedge in the Luxemburg garden at Paris, and of the cradle walk at Hampton-court; and while the paſſion for architectural gardening prevailed, the hornbeam was profuſely cultivated in our nurſeries. Brown, and his numerous followers, have now produced a more natural taſte, and the demand for it has conſequently diminiſhed. It is ſtill, however, entitled to the attention of the planter: and as, according to Evelyn, it preſerves itſelf beſt of all the foreſters from the brutting of deer, it is peculiarly proper for parks.

When intended for hedges or underwood, it is generally propagated by layers, but for timber-trees it ſhould always be raiſed from ſeeds. Theſe ſhould be ſown in the autumn, ſoon after they are ripe, and in two years time will be fit to tranſplant to the ſituation where they are to remain. If not intermixed with other trees they ſhould be planted pretty cloſe, eſpecially on the outſide of the plantations, that they may protect and draw each other up. If ſown in the ſpring the ſeeds ſhould be previouſly kept in ſand. In that caſe they will lie in the ground till the ſpring following, when, about the month of February, the ſurface ſhould be gently looſened and ſprinkled with freſh mould. After remaining three years in the native beds, the ſtraighteſt plants ſhould be tranſplanted for trees, and the reſt be removed to ten feet rows, and ſet five feet from each other, where, in four years, they will be fit to be again tranſplanted for hedges. Some prefer the ſpring for tranſplanting: others early in October. The tree plantations ſhould be thinned with caution, ſo as not to let in too much cold at once.

The hop hornbeam has in England been generally grafted upon the common hornbeam. This practice is condemned by Mr. Miller, the trees ſo raiſed being ſeldom of long duration: for, as the graft uſually grows much faſter than the ſtock, in a few years there is ſuch a diſproportion in their ſize, that, when expoſed to high winds, they are frequently broken at the point of their union.

Carpinus *viſcoſa*, Burm. Zeyl. tab. 23. See Dodonæa *viſcoſa*.

CARPIO, in *Geography*, a town of Spain, in the country of Leon; 3 leagues W.S.W. of Medina del Campo.—Alſo, a town of Spain, in the province of Cordova; 8 leagues N. of Cordova.—Alſo, a town of Spain, in the province of Eſtramadura; 2½ leagues from Badajoz.

CARPIONE, Giulio, in *Biography*, a painter of great eminence, was born at Venice, in 1611, made a very conſiderable proficiency under Aleſſandro Varotari, called Paduanino, and in a very ſhort time acquired a very great reputation for deſign, invention, and a charming tint of colouring. His pictures are generally ſmall, and the ſubjects which he commonly ſelected were bacchanals, proceſſions, and triumphs, in which he excelled; ſo that his paintings were highly valued and much ſought after: they are now very rare, and bear a high price. He alſo etched ſeveral plates, which, though ſlight, are performed in a very maſterly manner, and exhibit ſome reſemblance to thoſe of Guido. From his own compoſition, we may notice "Bacchanalian ſubjects, with Boys playing, &c.;" "Love blinding Temperance;" "Chriſt in the Garden of Olives;" "A holy Family, with Angels, and the Deity repreſented above;" and "A Repoſo; the Virgin reading, and Joſeph ſtanding by her." This artiſt died in 1674. Strutt. Pilkington.

CARPIONE, in *Ichthyology*, a name given by ſome old writers to the fiſh called in England the *charr*. See Salmo *alpinus*.

CARPIS, in *Ancient Geography*, a city of Pannonia, placed by Ptolemy near the Danube.—Alſo, a river, which ran into the Iſter, on the northern ſide. See alſo Carpi

CARPOBALSAM, or Carpobalsamum, the fruit of the tree which yields the true oriental balm, or balſam; very much reſembling, both in figure, ſize, and colour, that of turpentine. The word comes from καρπος, *fruit*; and βαλσαμος, *balſam*. The *carpobalſamum* is an oblong fruit with a ſhort foot-ſtalk, a brown wrinkled rind, marked with four ribs; of a grateful taſte and ſmell. See Balsam.

CARPOBOLUS, in *Botany*. See Lycoperdon *carpobolus*.

CARPOCRATIANS, in *Eccleſiaſtical Hiſtory*, a branch of the ancient Gnoſtics, ſo called from *Carpocrates*, who, in the ſecond century, adopted and taught philoſophical tenets, which agree, in general, with thoſe of the Egyptian Gnoſtics. He was born at Alexandria, and flouriſhed about the middle of the ſecond century. He acknowledged the exiſtence of one God, eternal and incomprehenſible, who made angels and powers of different orders, and to ſome of theſe he aſcribes the formation of this lower and viſible world. He taught that Jeſus was the ſon of Joſeph and Mary, according to the common courſe of nature; that he was endued with a moſt pure ſoul of great capacity and underſtanding, and that he retained the remembrance of the things which he had ſeen with the father, in his pre-exiſtent ſtate, which he revealed to men; that he wrought miracles, and excelled in the holineſs of his life, and in all virtue; and that he lived among the Jews, and ſuffered death; after which his ſoul aſcended to heaven and returned to God. He alſo inculcated the pre-exiſtence of human ſouls; and expected the ſalvation of the ſoul only, and not the reſurrection of the body. Some have aſſerted, that his doctrine, with regard to practice, was in the higheſt degree licentious. Accordingly, he is charged with not only allowing his diſciples to ſin, but recommending to them a vicious courſe of life, as a matter of obligation and neceſſity; and with aſſerting, that eternal ſalvation was attainable only by thoſe who had committed all ſorts of crimes, and had daringly filled up the meaſure of their iniquity. It is alſo ſaid, that, though he acknowledged the laws which Chriſt enjoined on his diſciples, he held that luſts and paſſions, being implanted in our nature by God himſelf, were not criminal and culpable; that all actions were indifferent in their own nature, and were rendered good or evil only by the opinions of men, or by the laws of the ſtate; that it was the will of God, that all things ſhould be poſſeſſed in common, the female ſex not excepted; but that human laws, by an arbitrary tyranny, branded thoſe as robbers and adulterers, who only uſed their natural rights. It has been ſaid alſo, on the authority of ſome ancient writers, that the Carpocratians marked their diſciples on the back part of one of their ears; that they had pictures and images of Chriſt and his apoſtles, and of ſome heathen philoſophers and poets; and that they honoured them with ſuperſtitious rites. They are charged alſo, not only with maintaining the community of women, but with allowing lewd and laſcivious practices at their ſuppers, or love-feaſts; and they were chargeable with unnatural uncleanneſs, as well as magic. Dr. Lardner, with his uſual impartiality and candour, examines the ground of theſe charges, and inclines to think that the immoral principles and immoral practices aſcribed to them are not proved, and that the charges are owing to miſtake or prejudice, or both. There might, he ſays, be looſe and wicked men among the Carpocratians, as there were in other ſects; but that they were countenanced either by Carpocrates, or by his ſon Epiphanes, who taught the ſame opinions with his father, and had many followers, though he died at the age of 18 years, or by the principles they taught, does not appear to him to be probable. Epiphanius ſays, that they rejected the Old Teſtament; but Dr. Lardner conjectures that poſſibly the fact only was this, that they did not reſpect the inſtructions of Moſes and the prophets equally with thoſe of Chriſt and his apoſtles. He apprehends alſo, that they received all the books of the New Teſtament, as they were received by other Chriſtians in their time. Moſheim, Eccl. Hiſt. vol. i. p. 227, &c. Larduer's Works, vol. ix. B. ii. ch. 3. p. 308—319.

CARPODETUS, in *Botany*, (from καρπος, *fruit*, and δεω, *to bind*, the fruit being ſurrounded or bound by a ring or fillet) Schreb. gen. 360. Mart. Willd. 410. Juſſ. 382. Forſt. gen. 17. Claſs and order, *pentandria monogynia.* Nat. Ord. *Rhamni*. Juſſ.

Gen. Ch. *Cal.* Perianth top-ſhaped, adhering to the germ, five-toothed: teeth awl-ſhaped, deciduous. *Cor.* Petals five, ovate, ſmall, inſerted into the margin of the calyx: anthers roundiſh. *Piſt.* Germ inferior (ſemiinferum: Juſſ.) ſtyle filiform, longer than the ſtamens: ſtigma capitate, depreſſed. *Peric.* Berry dry, globular, ſurrounded as with a ring by the adhering margin of the calyx, (ſemiinfera, Juſſ.) five-celled. *Seeds* ſeveral, ſomewhat angular.

Eſſ. Ch. Corolla pentapetalous, inſerted into the margin of the calyx. Berry inferior, dry, five-celled, annulated.

Sp. Carpodetus *ſerratus*. Forſt. Prod. iii. gen. p. 33. tab. 17. A native of New Zealand. According to Boſc. (nouv. dict.), it is one and the ſame plant with Ceanothus aſiaticus of Linnæus.

CARPOLOGY is that part of *Botany* which treats of the fruit of plants in the moſt extenſive ſenſe of the word, deſcribes its various appearances, divides it into diſtinct kinds, analyſes it into its ſeveral parts, and forms the whole into a regular ſyſtem. See FRUIT.

CARPUDEMUM, in *Ancient Geography*, a town placed by Ptolemy in the interior of Thrace.

CARPUS, in *Anatomy*, is the term applied to the wriſt. See SKELETON.

CARPUTH, in *Geography*, a town and fortreſs of Aſiatic Turkey, in the province of Aladulia; 12 miles from Arzengun.

CARPZOVIANUS, in *Biblical Hiſtory*, is the denomination of a MS. of the four goſpels, marked 78 in the firſt part of Wetſtein's New Teſtament, which Küſter, judging from the letters, ſuppoſed to be 600 years old. Gottlob Carpzow of Leipſick had it in his poſſeſſion, and Küſter procured from Dr. Boerner thoſe extracts, which he inſerted in Mill's edition of the Greek Teſtament.

CARPZOVIUS, BENEDICT, in *Biography*, was born in 1595, and ſucceeded his father, who was an eminent lawyer, as counſellor to the elector of Saxony, and aſſeſſor of the judges of appeals. His acquaintance with the juriſprudence and legal practice of Germany was very extenſive; and by availing himſelf of an induſtrious reſearch into the conſtitutions and determinations preſerved in the various archives of the country, he was the beſt writer on theſe ſubjects. Of his numerous works the principal are as follow, *viz.* "Practica rerum criminalium," fol. publiſhed in 1635, and ſeveral times reprinted and abridged; "Definitiones forenſes, vel juriſprudentia forenſis Romano-Saxonica ad conſtitutiones electoris Auguſti," 1638, fol.; A commentary "Ad legem regiam Germanorum," 1640; "Reſponſa juris electoralia;" fol. 1642; "Definitionum eccleſiaſticarum ſeu conſiſtoralium," &c. 1649; "Deciſiones Saxonicæ," 3 vols. 1646—52—54; and "Proceſſus Juris Saxonicæ," fol. 1657. The cloſe of his life at Leipſic was devoted altogether to the ſtudy of the ſcriptures, which he had read over, as it is ſaid, 53 times, beſides commentaries. He died in 1666. Several others of the ſame family and name diſtinguiſhed themſelves as theologians and philologiſts.

CARR, in *Agriculture*, is a ſort of cart made uſe of in ſome diſtricts for conveying light weights. There is an improved kind of carr, which is much employed in Leiceſterſhire, for conveying dung and other ſimilar matters upon land in an eaſy and expeditious manner, as a good horſe is capable of drawing near a ton weight in it. It is conſtructed in the following manner. The diameter of the wheels is four feet; the length of the body the ſame; the width of the body three feet ten inches; the extent of the ſhafts ten feet. Rails are capable of being occaſionally put on for the purpoſe of carrying turnips, or other roots of a ſimilar kind. It is made by Mr. Handford, of Hathern; and coſts when complete, 5*l.* 15*s.* 6*d.* and, with an iron axle-tree, 6*l.* 16*s.* 6*d.* This ſort of carriage was found very uſeful for various purpoſes on Mr. Bakewell's farm. And the *improved* Iriſh Carr is another uſeful ſort of carriage of this kind, which was much reccommended by the ſame intelligent farmer. It is obſerved, in the ſecond volume of communications to the Board of Agriculture, that "its principal advantages conſiſt in the facility with which it is loaded, from its lowneſs; and where gateways and roads are narrow, much room being gained by having the wheels under the body of the cart. In ſuch ſituations, this cart ſeems well calculated for carrying manure, eſpecially on meadow or ploughed land; and for that purpoſe its wheels ought to have a flat bearing, and be at leaſt ſix inches in breadth. Another advantage of this carr is, that from its conſtruction the wheels are neceſſarily cylindrical, at leaſt they are not neceſſarily conical; and the facility of draught ariſing from this unobſerved circumſtance has probably been imputed to ſome other part of the conſtruction, as we find by experiment, that the reſiſtance to the cylindrical wheel is not increaſed, but diminiſhed by increaſing the breadth, and the flat bearing of its rim. The knowledge of this fact is of very great importance to the farmer, as well as to the waggoner, ſince by this means, he may be enabled, in almoſt all ſeaſons, to drive his broad-wheeled carts, &c. on his meadow or plough grounds when no narrow wheel can be uſed; the advantages of which are too well known to be here inſiſted on: but when the width of gate-ways, and the breadth of roads, will admit of the wheels being placed at the ſides of the cart, without confining the width of its body, it will probably be more advantageous to have them ſideways than under the cart." A carr of this nature is repreſented at *fig.* 2. *Plate* III. of *Agriculture*.

CARR, *carrum*, in the *Middle Age*, denoted any ſort of vehicle, or carriage, either by land or ſea.

CARR, *Carrus*, a kind of rolling throne, uſed in *Triumphs*, and at the ſplendid entries of princes.

The word is from the ancient Gauliſh, or Celtic, *carr*; mentioned by Cæſar, in his Commentaries, under the name *carrus*. Plutarch relates, that Camillus having entered Rome in triumph mounted on a carr drawn by four white horſes, it was looked on as too haughty an innovation.

CARR is alſo uſed for a kind of light or open chariot. Pontanus obſerves, that Erichthonius was the firſt that harneſſed horſes, and joined them in a carr or chariot. The carr, on medals, drawn either by horſes, lions, or elephants, uſually ſignifies, either a triumph, or an apotheoſis: ſometimes a proceſſion of the images of the gods, at a ſolemn ſupplication; and ſometimes of thoſe of ſome illuſtrious families at a funeral.—The carr covered, and drawn by mules, only ſignifies a conſecration, and the honour done any one of having his image carried at the games of the circus. See Consecration.

The carr uſed by the ladies was called *pilentum*, *carpentum*, and *baſterna*. See Coach.

Carr, in *Geography*, a ſmall plantation in the county of Lincoln and diſtrict of Maine, North America.

CARRA, a river of the county of Kerry, Ireland, which riſes in Magillicuddy's reeks, W. of the lake of Killarney, and after a rocky courſe of a few miles flows into a lake of the ſame name, from which its waters are emptied into the bay of Caſtlemain. On, or very near the banks of this river was the village of *Blackſtones*, a romantic ſpot where Sir W. Petty erected iron works, which continued as long as the timber on the neighbouring mountains ſupplied wood for charcoal; but when this was exhauſted, from neglect of copſeing, the works ceaſed, and the village has gone to decay. Smith's Kerry.

CARRAC, or Carraca, a name given by the Portugueſe to the veſſels they ſend to Braſil and the Eaſt Indies; being very large, round built, and fitted for fight as well as burden. Their capacity lies in their depth, which is very extraordinary. They are narrower above than underneath, and have ſometimes ſeven or eight floors; they carry about 2000 tons, and are capable of lodging 2000 men; but of late they are little uſed. Formerly they were alſo in uſe among the knights of Rhodes, as well as among the Genoeſe, and other Italians.

It is a cuſtom among the Portugueſe, when the carracs return from India, not to bring any boat or ſloop for the ſervice of the ſhip, beyond the iſland of St. Helena; at which place they ſink them on purpoſe, in order to take from the crew all hopes or poſſibility of ſaving themſelves, in caſe of ſhipwreck.

In the year 1592, a Portugueſe carrack was captured by Sir John Barrough which is thus deſcribed. "This carrack was in burthen no leſs than 1600 tons, whereof 900 were merchandiſe: ſhe carried 32 pieces of braſs ordnance, and between ſix and ſeven hundred paſſengers: was built with decks, ſeven ſtory, one main aſlope, three cloſe decks, one fore-caſtle, and a ſpare deck, of two floors apiece. According to the obſervations of Mr. Robert Adams, an excellent geometrician, ſhe was in length from the beak-head to the ſtern 165 feet; in breadth near 47 feet; the length of her keel 100 feet: of the main-maſt 121 feet; its circuit at the partners near 11 feet; and her main-yard 106 feet."

CARRACA, in *Ancient Geography*, a town of Italy, in the country of the Bechuni according to Ptolemy; ſuppoſed to be *Caravaggio*.

CARRACCI. See Caracci.

CARRÆ, in *Ancient Geography*, a town of Aſia, in Syria, ſituate to the eaſt of a chain of mountains, on the banks of a ſmall river, S. W. of Goaria, and at ſome diſtance to the eaſt of Heliopolis.

CARRAGH *Lough*, a very pretty lake of the county of Mayo, Ireland, 5 miles long and 2½ broad, with wooded peninſulas and iſlands. In the ſurrounding barony which is called from it, and includes the town of Caſtlebar, the linen manufacture is carried on in a manner ſuperior in neatneſs to moſt parts of the county.

CARRAGHROE *Mountains*, mountains in the weſtern extremity of the county of Tyrone adjoining the county of Donnegal, and North of Lough Derg. Beaufort.

CARRAGO, in *Antiquity*, a kind of fortification, or defence about a camp, compoſed of carts, waggons, and the like vehicles, chained or faſtened together; chiefly uſed by the barbarous nations.

CARRANTAGEA *Lagoon*, in *Geography*, a large gulf on the ſouth ſide of the bay of Honduras, about 70 miles N. W. of Cape Gracios a Dios, and nearly as far S. E. from Brewer's Lagoon.

CARRANZA, Bartholomew, in *Biography*, an eminent catholic prelate, was born in 1503 at Miranda in Navarre, entered among the Dominicans in Caſtile, taught theology with high reputation at Salamanca, and diſtinguiſhed himſelf in the council of Trent by his zeal in maintaining the duty of clerical reſidence. In 1554 he was taken to England by his pupil Philip of Auſtria, afterwards king of Spain, when he went to marry queen Mary, with a view of ſucceſsfully combating proteſtantiſm, for which he was not deficient in his ardent efforts. He was appointed confeſſor to the queen, and in recompence of his ſervices to Philip, was promoted by him, in 1557, to the rich archbiſhopric of Toledo. He had the honour of attending the emperor Charles V. at his death, and of adminiſtering to him the laſt ſacraments. However he was ſoon after ſuſpected of hereſy, and in 1559 committed to the priſon of the inquiſition. In his way thither he ſaid to his companions; "I go between my beſt friend and my worſt enemy; my friend is my innocence; my enemy is my archbiſhopric of Toledo." After a confinement of 8 years in Spain, he appealed to Rome, and removing thither, it was not till after the expiration of 9 years more, viz. in 1576, that ſentence was pronounced againſt him. The ſentence of this deteſtable court was founded on mere ſuſpicion; and on the ground of the ſtrong preſumptions that were alleged againſt him, he was condemned to make a ſolemn abjuration of his ſuppoſed errors. In conſequence of this ſentence to which he ſubmitted with reſignation, he retired to the convent of Minerva, which belonged to his order. Here he ſoon after died in his 72d year, proteſting his innocence as to any mental offence reſpecting the faith, but at the ſame time acknowledging the juſtice of the proceedings againſt him. Such was his reputation for ſanctity, and ſo impreſſed were the minds of the people with reſpect to his innocence, that on the day of his funeral, the ſhops were ſhut; and his remains were venerated like that of a ſaint. Gregory XIII. placed on his tomb an epitaph, which did juſtice to his memory, and which repreſents him as illuſtrious both for his learning and his morals, modeſt in proſperity and patient in adverſity. His principal works are "Summa Conciliorum," 1681, 4to; a Collection of Councils held under the popes from St. Peter to Julius III.: a Latin treatiſe "On Reſidence," 1547; and a "Spaniſh Catechiſm," which was put into the prohibited index by the inquiſition. Gen. Dict. Nouv. Dict. Hiſt.

CARRAPATEIRA, in *Geography*, a town of Portugal, in the province of Algarve; 10 miles N. of Sagres.

CARRARA, a town of Italy, in the principality of Maſſa; 3 miles N. of Maſſa, celebrated for its marble.

Carrara *marble*, among our *Artificers*, the name of a ſpecies of white marble, which is called *marmor* lunense, and *liguſtrium* by the ancients: it is diſtinguiſhed from the Parian, now called the ſtatuary marble, by being harder and leſs bright.

CARRAT, Carat, or Caract. See Caract.

CARRE', Louis, an eminent mathematician, was born in 1663 in the province of Brie in France. His father intended him for the church, and he was engaged for three years in the ſtudy of theology; but refuſing to take orders, his means of ſubſiſtence at Paris were diſcontinued; and in this diſtreſſed ſituation he found an aſylum under the patronage of Father Mallebranche, who employed him as an amanuenſis. Here he acquired the mathematics and the moſt ſublime metaphyſics. Having continued ſeven years in this excellent ſchool, he undertook to teach the mathematics and philoſophy, and ſucceeded to ſuch a degree as to attach a great number of ſcholars, many of whom were females; of whoſe underſtandings in general, he formed a higher opinion than he did of thoſe of men. In this ſituation his time was ſo much employed, that he had not leiſure to purſue thoſe reſearches in the ſublime geometry to which his taſte inclined him. However, in 1697, he was admitted as an eleve into the Academy of Sciences by the favour of M. Varignon; and in 1700 he publiſhed the firſt entire work which had appeared on the integral calculus, under the title of "A Method of meaſuring ſurfaces and ſolids, and finding their centres of gravitation, percuſſion, and oſcillation." This work was afterwards corrected and improved in a ſecond edition. Under the patronage of Varignon, Carré ſoon became aſſociate, and afterwards penſioner: and he was thus enabled to devote his whole time to ſtudy. As he occupied the office of mechanic, he directed his principal views to that ſubject, and contrived every thing that relates to muſic, the theory of ſounds, the deſcription of different inſtruments, &c. But his labours were interrupted by ill health, and at length he cloſed his life with fortitude and calmneſs on the 11th of April, 1711, in the 48th year of his age. Many of his mathematical and philoſophical treatiſes were left to the Royal Academy, and remain unpubliſhed. His memoirs in the volumes of the Academy are the following: viz. "The Rectification of Curve Lines by Tangents," 1701; "Solution of a Problem propoſed to Geometricians, &c." 1701; "Reflections on the Table of Equations," 1701; "On the Cauſe of the Refraction of Light," 1702; "Why the Tides are always augmenting from Breſt to St. Malo, and diminiſhing along the Coaſts of Normandy," 1702; "The Number and the Names of Muſical Inſtruments," 1702; "On the Rectification, &c. of the Cauſtics by Reflection," 1703; "Method for the Rectification of Curves," 1704; "Obſervations on the Production of Sound," 1704; "On a Curve formed from a Circle," 1705; "On the Refraction of Muſket-balls in Water, and on the Reſiſtance of that Fluid," 1705; "Experiments on Capillary Tubes," 1705; "On the Proportion of Pipes to have a determined Quantity of Water," 1705; "On the Laws of Motion," 1706; "On the Properties of Pendulums, with ſome new Properties of the Parabola," 1707; "On the Proportion of Cylinders, that their Sounds may form the Muſical Chords," 1709; "On the Elaſticity of the Air," 1710; "On Catoptrics," 1710; "On the Monochord," &c. &c. Eloge par Fontenelle, 1711. Rozier's Index.

Carré, Henry, a painter of reputation, was born, as Weyerman and Deſcamps ſay, at Amſterdam, in 1656, but according to Houbraken in 1658, and became a diſciple, firſt of Jurian Jacobsz of Hamburgh, and afterwards of Jacques Jordaens. As ſtate painter at the court of Frizeland, he adorned the palace with ſeveral fine paintings, particularly landſcapes, in which he introduced huntings of the wild boar and of other animals, in all which ſubjects his manner reſembled that of Sayders. However, he ſpent the greateſt part of his life at Amſterdam and the Hague, where his works were in high eſteem. His uſual ſubjects were landſcapes, with peaſants attending flocks of ſheep, or herds of cattle; huntings; and ſometimes converſations. His ſtyle was pleaſing, and his manner of colouring good; his figures were well deſigned, and touched with ſpirit; though many of his pictures ſhew too great a degree of darkneſs. He died in 1721.

Carré, Michael, the younger brother of the former, was born at Amſterdam in 1666, and having commenced the ſtudy of his art under his brother, accompliſhed himſelf in his profeſſion as the diſciple of Nicholas Berchem; he afterwards preferred the ſtyle of Vander Leew to that of Berchem. He reſided ſeveral years in London, without obtaining much employment or reputation. After his return to his native city, he was invited to the Pruſſian court and liberally recompenſed for his works as an artiſt. His taſte led him to embelliſh grand ſaloons, halls, and large apartments; and in works of this kind he was fond of introducing ſubjects that excited terror; ſuch as ſtorms with lightning, the deſtruction of caſtles and towers, and the tearing up of trees by the roots. In his eaſel pictures he had a ready hand, and a neat manner of pencilling. Pilkington.

CARREA *Pollentia*, in *Ancient Geography*, a town of Italy, in Liguria, N. of *Auguſta Vagiennorum*, celebrated for its black wool.

CARREI, a people who, according to Pliny, inhabited the interior of Arabia Felix, and to whom he aſſigns the town of Carriatha, called by Ptolemy Chariatha.

CARREL, in *Antiquity*, a cloſet or apartment for privacy and retirement. This term, which has been long diſuſed, was principally applied during what are called the middle ages to the cloſets for ſtudy which were uſually given to each monk in the cloiſter of his monaſtery. In the viſitations of the old religious houſes the prior or ſuperior is frequently enjoined to viſit theſe *Carolæ*, or cells, once or twice a year. (See Cowel's Law Interpreter, *v.* Carola.)

CARRHÆ, in *Ancient Geography*, a very ancient city of Aſia in Meſopotamia, near the Euphrates, at the diſtance of eighty miles from Hierapolis. It was famous for the defeat of the Romans by the Parthians, and the death of Craſſus, the Roman general, and alſo for a temple of the moon. M. D'Anville places it to the weſt of a ſmall chain of mountains, which ſeparated it from Chaboras. See Haran.

CARRI, in *Geography*, a town of Italy, in the province of Piedmont; eight miles N.N.W. of Ceva.

CARRIAGE, a vehicle for the conveyance of perſons, goods, &c. from place to place.

Carriage *Artillery*, in French *affuts des canons*, are wooden frames or machines, on which cannons are mounted and tranſported from one place to another. They are of various kinds.

*Garriſon-gun-carriages* are thoſe, on which garriſon-guns are commonly mounted. Such a carriage with its gun on it moves on four caſt-iron trucks or ſmall low wheels ſeldom exceeding twenty-four inches in diameter.

A *Ship-gun-carriage* differs from a garriſon-gun-carriage only in having its trucks of wood, and breach-rings, which the other has not.

There are copper clouts underneath the axle-trees of garriſon-carriages to diminiſh the friction of the iron on the wood.

*Travelling-carriages* and field carriages are ſuch as guns are mounted and tranſported on when employed at ſieges or on ſervice in the field. They are much longer than garriſon or ſhip gun-carriages and are differently conſtructed. Every ſuch carriage has two wheels and a long trail. And the limber for moving it with by means of the pintle-pin or iron bolt has two wheels alſo.

*Limbers*, are two-wheel-carriages, made commonly each with two ſhafts, but ſometimes with a beam or pole, for drawing double with. They ſupport the trails of travelling or field carriages, by means of the pintle-pins or iron bolts, when the guns are to be tranſported, or removed from one place to another. The pieces are generally fired with the trails of their carriages taken off from the limbers—but they may be fired with them on the ſame, and ſometimes are on a march when attacked, or preſſed on by an enemy.

*Galloper-carriages*, are for one and a half pounders. Such a carriage has ſhafts to be drawn without a limber, and is regarded by many artilleriſts, as more convenient than other field-carriages, and preferable to them. It is a carriage, that anſwers very well alſo for a light three, or ſix pounder.

*Howitzer-carriages*, are for ſupporting, and tranſporting howitzers. Thoſe for the 6 and $\frac{5}{8}$ inch howitzers are made with ſcrews, for elevating them in the ſame manner as the light ſix-pounder-carriages are. They are therefore made without a bed, and the centre-tranſom is nine inches broad for fixing the elevating ſcrew in, inſtead of four, as in thoſe that are made without ſuch a ſcrew. In the centre, between the trail and centre-tranſom, there is a tranſom-bolt, which is not in others, becauſe the centre-tranſom muſt be made to be taken out; and when it is, the howitzer may be elevated to any degree under ninety.

*Tumbrel*, or *Tumbrel-carriages*, are carriages with two wheels, commonly made uſe of for carrying the pioneers', miners', and artificers' tools. They are alſo ſometimes employed for carrying the money of the army.

*Block-carriage*, is one that is made out of a ſolid block, or piece of timber, ſo hollowed or cut into, as to receive the gun or howitzer into the cap-ſquares: the flat, or lower part of the cap-ſquare is let into the ſolid wood, and the gun or howitzer is elevated or depreſſed by means of a ſcrew, as on another carriage. The limber of this carriage carries two large cheſts for ammunition, and takes four men. The pintle-pin, or iron bolt of the limber, is ſo conſtructed as to take the gudgeon of the carriage, by which means a greater relief is obtained when the carriage paſſes over rough or uneven ground. Block-carriages are chiefly made for the purpoſe of conveying mortars and their beds from one place to another.

Block-carriages are alſo uſed by the horſe-artillery, as curricles. They are very uſeful on ſervice. The original inventor of theſe is the ingenious General Congreve, to whom the Board of Ordnance is indebted for many improvements, and the nation for important ſervices; which merit attention and recompence.

*Truck-carriages*, are for carrying timber and other heavy articles from one place to another, at no great diſtance from it. They are alſo employed for moving guns and mortars, where their own carriages cannot go, and are drawn by men as well as horſes and other beaſts of burthen.

*A Ponton-carriage* is ſolely for tranſporting the pontons. Formerly it had only two wheels, but now it has generally four.

Beſides theſe, there are other artillery carriages, as land and ſea mortar-beds, which have no wheels, as mortars are not tranſported on their carriages; powder carts; ammunition waggons; ſling waggons; travelling forges; and pontons.

*Figure* 1. (See *Artillery-carriages* in the plates) is the outſide elevation or profile of a garriſon or ſhip carriage; and *fig.* 2. is the inſide elevation of one of the cheeks or ſide pieces, ſhewing ſome of the irons in it, that would not otherwiſe be ſeen; the manner in which theſe pieces ſhould be let into the axletrees, and the poſition of the tranſom.

The height of each ſide-piece before, is equal to 4¾ diameters of the ſhot, and its height behind is only half as much. The length of the ſide-piece is ſuppoſed to be biſected or divided into two equal parts, and of theſe two, the hind part is ſuppoſed to be divided into four equal parts, as a ſcale for making the ſteps by. Each of theſe ſide-pieces is hollowed or cut out beneath, in the form of a circular arc, of which the radius is about half the length of the piece. This makes it ſomewhat lighter without diminiſhing its ſtrength. Both the axletrees are ſunk into the ſide-pieces in the manner repreſented in *fig.* 2. The tranſom is placed directly over the fore-axletrees, in the middle of the height of the ſide-pieces, and is one diameter of the ſhot broad, and two deep.

The following are the names of the different pieces of iron-work in a ſhip and garriſon-carriage, with the number of each. See *Artillery-carriages*, *fig.* 1. and .

| | |
|---|---|
| *a.* The curved parts of the cap-ſquares, - - | 2 |
| *b.* Eye-bolts, - - - - - | 2 |
| *c.* Joint-bolts, - - - - - | [illegible] |
| *d.* Tranſom bolts, - - - | 1 |
| *e.* Bed-bolt, - - - - - | 1 |
| *f.* Bracket-bolts, - - - | 2 |
| *g.* Hind axletree-bolts, - - - | 4 |
| *h.* Breeching-bolts with rings, - - - | 2 |
| *k.* Burs, - - - - | 2 |
| *l.* Loops, - - - - | 6 |
| *m.* Dowel-pins, - - - - - | 4 |
| *n.* Square rivetting plates, - - - | 8 |
| *p.* Rings with keys, - - - - | 10 |
| *q.* Traverſing plates, - - - | 2 |
| *r.* Linch-pins, - - - - | 4 |
| *s.* Axletree-hoops,. - - - | 2 |
| *t.* Axletree-ſtays, - - - - - | 2 |
| *w.* Keys, chains, and ſtaples, - - | 2 |
| *x.* Stoolbed-bolts, with rivetting plates, - - | 2 |

*N. B.* The garriſon-carriage has all theſe irons as well as the ſhip-carriage, except the two breeching-bolts with rings.

The conſtruction of theſe carriages is as follows. See *fig.* 3. Let A B be any indefinite right line. In it take any two points, C, D, ſo that the diſtance between them ſhall be equal to three ſeventh parts of the gun's length, or to the diſtance from the centre of the trunnions to the extremity of the breech. Through theſe points draw two right lines at right angles to A B. On the firſt of theſe, take C E, C F, in oppoſite directions and each of them equal to half the diameter of the ſecond reinforce-ring of the gun. On the ſecond take alſo D G, D H, in oppoſite directions, and each of them equal to half the diameter of the baſe-ring. Then right lines drawn through the points E, G, and F, H, will determine the inſide width of the carriage.

If parallel to theſe two laſt mentioned right lines, there be drawn two others at the diſtance of one caliber of the gun from them reſpectively, theſe again will determine the breadth of each of the ſide-pieces and the outſide width of the carriage. And if, from D towards B, there be ſet off D I, equal to the length of the caſcables, and from C towards A, there be ſet off C K, equal to half the diameter of one of the trunnions, with half the diameter of one of the fore-trucks, I K will be the length of the carriage.

The right line E F, paſſes through the centre of the trunnion-holes, the diameter of each of which is equal to a caliber of the gun. The centre of each of theſe holes is about a quarter of an inch below the upper ſurface of the ſide-piece. Six inches are ſet on each ſide of G H, for the axletree, which is always twelve inches broad.

The dimenſions of ſuch a carriage are ſpecified in the following Table.

| Natures of the guns. | | 42 Pounder | 32 Pounder | 24 Pounder | 18 Pounder | 12 Pounder | 9 Pounder | 6 Pounder | 3 Pounder |
|---|---|---|---|---|---|---|---|---|---|
| | | Inches and decimals. | Inches and decimals. | Inches and decimals. | Inches and decimals. | Inches and decimals. | Inches and decimals. | Inches and decimals. | Inches and decimals. |
| Width encloſed before - - | | 18.0 | 18.0 | 16.5 | 15.5 | 14.0 | 13.0 | 11.5 | 9.0 |
| Width encloſed behind - - | | 23.5 | 23.5 | 22.5 | 21.5 | 19.5 | 18.5 | 16.8 | 12.5 |
| Fore axle-tree length - - | | 57.0 | 57.0 | 54.5 | 51.5 | 45.5 | 42.5 | 38.8 | 32.5 |
| Body - - | Length - | 35.4 | 36.6 | 34.9 | 33.1 | 29.5 | 27.5 | 24.8 | 19.5 |
| | Height - | 10.8 | 10.8 | 10.0 | 10.0 | 10.0 | 9.5 | 9.0 | 8.5 |
| | Breadth - | 6.8 | 6.8 | 6.8 | 6.0 | 5.5 | 5.2 | 5.0 | 4.0 |
| Arms - - | Length - | 10.8 | 10.2 | 9.8 | 9.2 | 8.0 | 7.5 | 7.0 | 6.5 |
| | Diameter - | 6.2 | 6.2 | 6.2 | 5.8 | 5.2 | 5.0 | 4.5 | 3.5 |
| Hind axle-tree length - - | | 57.0 | 57.0 | 54.0 | 51.5 | 45.5 | 42.5 | 38.8 | 32.5 |
| Body - - | Length - | 35.4 | 36.6 | 34.9 | 33.1 | 29.5 | 27.5 | 24.8 | 19.5 |
| | Height - | 6.8 | 6.8 | 6.8 | 6.0 | 5.5 | 5.2 | 5.0 | 4.0 |
| | Breadth - | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 |
| Arms - - | Length - | 10.8 | 10.2 | 9.8 | 9.2 | 8.0 | 7.5 | 7.0 | 6.5 |
| | Diameter - | 6.2 | 6.2 | 6.2 | 5.8 | 5.2 | 5.0 | 4.5 | 3.5 |
| Fore-trucks - | Diameter - | 19.0 | 19.0 | 18.0 | 18.0 | 16.0 | 16.0 | 14.0 | 14.0 |
| | Breadth - | 6.5 | 6.0 | 5.5 | 5.0 | 4.5 | 4.0 | 3.5 | 3.0 |
| Hind-trucks - | Diameter - | 16.0 | 16.0 | 16.0 | 15.0 | 14.0 | 14.0 | 12.0 | 10.0 |
| | Breadth - | 6.5 | 6.0 | 5.5 | 5.0 | 4.5 | 4.0 | 3.5 | 3.0 |
| Side-pieces - | Height before | 26.8 | 26.2 | 26.0 | 23.6 | 20.0 | 18.8 | 16.0 | 13.6 |
| | Length - | 78.0 | 78.0 | 72.0 | 69.0 | 66.0 | 63.0 | 60.0 | 37.5 |
| | Breadth - | 6.5 | 6.0 | 5.5 | 5.0 | 4.5 | 4.0 | 3.5 | 3.0 |
| Diſtance of trunnions from the head | | 8.0 | 8.0 | 8.0 | 8.0 | 6.8 | 6.6 | 6.6 | 6.0 |

Mr. Muller, in his "Treatiſe on Artillery," gives another conſtruction for gun-carriages to ſuit his conſtruction of guns. In conſtructing both he ſuppoſed the diameter of the ſhot to be divided into 24 equal parts; and on this ſuppoſition, in conſtructing the gun-carriage, he takes CD, (ſee *fig.* 3.) equal to ſix diameters of the ſhot, and ten parts; CE, CF, each equal to 34 parts; DG, DH, each equal to 39.5 parts; the breadth of each of the ſide-pieces equal to one diameter, or 24 parts; DI equal to one diameter and 12 parts; and CK equal to two diameters and a half. He makes the breadth of the fore axle-tree equal to 30 ſuch parts; its length equal to ſix diameters and a third; the length of each of the arms equal to 44 ſuch parts, and the diameter of each of them equal to 24 ſuch parts. In the elevation he makes the height of each of the ſide-pieces before, equal to four diameters and three quarters, and equal to half that height behind. The height or depth of the fore axle-tree he makes equal to 42 ſuch parts; and that of the hind axle-tree equal to 30 ſuch parts. The bed-bolt paſſes under the middle of the fourth ſtep and is even with the laſt, or hind ſtep.

He makes the breadth, or thickneſs of each of the wooden trucks equal to that of each of the ſide-pieces, which by his conſtruction is equal to one diameter of the ſhot, or to 24 ſuch parts; the diameter of each of the fore-trucks equal to four diameters of the ſhot, and that of each of the hind-trucks equal to three diameters and a half. Theſe diameters, however, muſt of courſe be increaſed or diminiſhed to ſuit the height of the port-holes in ſhips.

*Of travelling, or field carriages.* The long ſide-pieces, PQ, RS, (ſee *fig.* 12.) are called the cheeks; the fore part, QR, of the carriage, is called the breaſt, and the hind part, PS, the trail. T denotes the trail-tranſom; X the bed-tranſom; V the centre-tranſom; and Y the breaſt tranſom; GH the body of the axle-tree; W the pintle-hole; and m,n denote the trunnion-holes.

The following are the dimenſions of the cheeks.

| Natures of the guns. | | 24 Pounder | 18 Pounder | 12 Pounder | 6 Pounder | 3 Pounder |
|---|---|---|---|---|---|---|
| | | Inches and decimals. | Inches and decimals. | Inches and decimals. | Inches and decimals. | Inches and decimals. |
| Lengths of the cheeks | | 156.0 | 150.0 | 144.0 | 132.0 | 120.0 |
| Thickneſs of ditto | | 5.8 | 5.2 | 4.6 | 3.6 | 3.0 |
| Height of the plank | | 22 0 | 21.6 | 19.0 | 16.0 | 13.0 |
| Height of the cheek | Before | 20.0 | 19.6 | 17.0 | 14.0 | 11.5 |
| | Centre | 17.0 | 16.6 | 15.0 | 12.0 | 9.5 |
| | Trail | 12 0 | 11.6 | 11.0 | 10.0 | 7.5 |
| Head from the centre | | 74.0 | 72.0 | 69.0 | 60.0 | 51.5 |
| Length of the trail | | 18.0 | 16.6 | 15.0 | 12.0 | 10.0 |

The following are the dimenſions of the axle-trees.

| Natures of the guns. | | 24 Pounder | 18 Pounder | 12 Pounder | 6 Pounder | 3 Pounder |
|---|---|---|---|---|---|---|
| | | Inches and decimals. | Inches and decimals. | Inches and decimals. | Inches and decimals. | Inches and decimals. |
| Body | Length | 38.5 | 38.8 | 39.0 | 40.0 | 40.5 |
| | Breadth | 7.0 | 6.8 | 6.5 | 6.0 | 5.5 |
| | Height | 9.0 | 8.8 | 8.5 | 8.0 | 7.5 |
| Arms | Length | 21.0 | 20.8 | 20.5 | 19.0 | 17.5 |
| | Body diameter | 7.0 | 6.8 | 6.5 | 6.0 | 5.5 |
| | Linch diameter | 5.0 | 4.8 | 4.5 | 4.0 | 3.5 |
| Total length | | 80.5 | 80.4 | 80.0 | 78.0 | 75.5 |

And the following are the dimenſions of each of the wheels.

| Natures of the guns. | | 24 Pounder | 18 Pounder | 12 Pounder | 6 Pounder | 3 Pounder |
|---|---|---|---|---|---|---|
| | | Inches and decimals. | Inches and decimals. | Inches and decimals. | Inches and decimals. | Inches and decimals. |
| The diameter of each of the wheels | | 58.0 | 58.0 | 58.0 | 58.0 | 58.0 |
| The length of the nave | | 17.5 | 17.5 | 17.0 | 15.5 | 12.5 |
| Diameter of ditto | Body | 15.0 | 15.0 | 15.0 | 13.0 | 12.5 |
| | Middle | 16.0 | 16.0 | 16.0 | 14.0 | 13.0 |
| | Linch | 13.5 | 13.5 | 13.5 | 10.0 | 10.0 |
| Felloes, or fellies | Thickneſs | 5.0 | 5.0 | 4.5 | 4.0 | 3.0 |
| | Breadth | 6.5 | 6.5 | 6.0 | 5.5 | 5.0 |
| Spokes | Thickneſs | 2.3 | 2.3 | 2.2 | 2.1 | 2.0 |
| | Breadth | 4.5 | 4.5 | 4.0 | 3.5 | 3.0 |

The following are the names and numbers of the different irons, or pieces of iron-work in a travelling carriage.

| | | |
|---|---|---|
| Tranſom bolts with burs | Breaſt | 1 |
| | Centre | 2 |
| | Trail | 2 |
| Tranſom-bolts with hooks | Breaſt | 2 |
| | Centre | 2 |
| | Trail | 2 |
| Trunnion-plates | | 2 |
| Cap-ſquares with joint-bolts | | 2 |

| | | |
|---|---|---|
| Spring keys with chains and ſtaples | | 4 |
| Eye-bolts | Fore | 2 |
| | Hind | 2 |
| Single fore-lock keys | | 8 |
| Breaſt-plates | | 2 |
| Bed piece chain and ſtaple | | 1 |
| Plates with roſes | Garniſh | 2 |
| | Trail | 2 |
| Garniſh | Bolts | 2 |
| | Nails | 6 |
| Axle-tree bands | | 2 |
| Side-ſtraps | | 4 |
| Locker | Hinges | 2 |
| | Haſp with ſtaple | 1 |
| Draught-rings with bolts and burs | | 2 |
| Locking plates | | 2 |
| Laſhing-rings with loops | | 8 |
| Nails | Roſe-buds | 4 |
| | Diamond-headed | 8 |
| | Counter-ſunk | 0 |
| | Trail | 26 |
| Pintle-plates | | 2 |

The names and numbers of the parts and irons of a travelling carriage-wheel are the following.

| | |
|---|---|
| Nave | 1 |
| Spokes | 12 |
| Felloes, or fellies | 6 |
| Dowel-pins | 6 |
| Streaks | 6 |
| Streak-nails | 48 |
| Nave-boxes | 2 |
| Nave-hoops | 3 |
| Dowledges | 6 |
| Rivets for ditto | 24 |
| Nave hoop-ſtubs | 9 |
| Box-pins | 6 |

The dowel-pins are wooden pegs about three inches long each, and three quarters of an inch in diameter. They ſerve for joining or faſtening the felloes together.

The dowledges are iron plates, which are ſunk into the felloes on the outſide, and are each of them faſtened to the ſame with four pins, or rivets. They ſerve to faſten the felloes ſtrongly together, and to ſtrengthen the joints.

The nave is almoſt always made of elm, cut ſix months before it is uſed, and left all that time in the bark. Larch, however, would probably be found on trial to anſwer full as well, if not much better. The ſpokes are made of elm, or young oak, as dry and well ſeaſoned as poſſible. The felloes are for the moſt part alſo of elm, but are ſometimes made of ſplit beech, which makes to the full as good, if not better ones. And the axle-tree is generally made out of dry elm, young oak, or young beech. Swamp-maple is, however, much preferable for this purpoſe to either elm or beech.

The cheeks and tranſoms are always made of dry elm. But either young oak, or ſwamp-maple, are preferable to it for both.

The names and the numbers of irons, or pieces of iron-work in the axle-tree of a travelling-carriage, are the following.

| | | |
|---|---|---|
| Axle-tree bar | | 1 |
| Clouts | Body | 2 |
| | Linch | 2 |
| Axle-tree hoops | Linch | 2 |
| | Arms | 2 |
| | Body | 2 |
| Hurlers with ſtraps | | 2 |
| Waſhers | | 2 |
| Linch-pins | | 2 |
| Axle-tree bolt | | 1 |
| Single fore-locks | | 2 |
| Clout-nails | | 12 |
| Dog-nails | | 8 |
| Axle-tree hoops | | 2 |

The uſual conſtruction of travelling-carriages is the following. See *fig.* 11.

Let A b c d be the plank, out of which one of the cheeks is to be made, and let A B be the height of the ſaid cheek before. Set off from B to C the ſum of the ſaid height, or of the head, A B, and the diſtance from the hind part of the trunnions to the extremity of the caſcable. Then, from the point, A, as a centre with the radius, A C, deſcribe an arc, in which, as a chord, apply a right line, C D, equal to the height of the cheek at the centre, and draw the right lines, A D, B C. On B C, take B E, equal to the head, A B, or height of the cheek before, and from the point, E, ſet off towards B the right lines, E r, r S, equal each to half the diameter of one of the trunnions. Then, E S being equal to the diameter of the trunnion, cut the trunnion-hole out of the cheek, ſo that its centre may be about a quarter of an inch below the line, B C, or E S. From the point, r, draw the right line, r F, perpendicular to A D, or parallel to A B, and in A D, take F H, equal to the breadth of the axle-tree, which is ſunk or let in about an inch into the cheeks. On the right line, F H, conſtitute a ſquare, and from I, the point of interſection of its diagonals, as a centre with a radius of 29 inches, which is equal to the radius of the wheel, deſcribe an arc. This arc will repreſent a part of the wheel; and if a ruler touching the ſaid arc be ſo laid acroſs the plank, that the diſtance, M L, between the points, M, L, where their edges meet, be equal to the length of the trail, and from the points, M, L, perpendiculars, M N, L O, to M L, be alſo erected, equal each to the height of the trail, the right lines, C N, N O, and D M, being drawn, will, with the right lines, A B, B C, and A D, give the figure, A B C N O P M D A, of the cheek required.

The lower part, M P, of the trail is rounded in order that the carriage may ſlide with more eaſe on the ground, or on a platform, which rounding is formed by firſt dividing L O into four equal parts, and taking L P equal to one of them; ſecondly, by erecting right lines at the points, M, P, perpendicular reſpectively to D M, M P, and meeting in the point Q; and laſtly, by biſecting M Q in the point, R, and from R, as a centre with the radius, R M, deſcribing the arc, M P.

The mortiſe, V, of the centre-tranſom is aſcertained or determined by drawing a right line through the point, C, perpendicular to the horizon, K M, in which C p is taken equal to a fourth part of the ſhot's diameter, and p q equal to twice that diameter for its height. Its breadth, p x, taken in a right line, p z, parallel to K M, is equal to one diameter of the ſhot. The diſtance between the centre-tranſom, V, and the bed-tranſom, X, is equal to two diameters of the ſhot; and the height and breadth of this laſt are each equal to one diameter. The breaſt-tranſom, Y, is one diameter of the ſhot broad and two high. The ſides of it are parallel to the head, A B, and terminate above, or at top in a right line parallel to B E, and equally diſtant from it with the bottom of the trunnion-hole. And the inſide one of them, if produced, would paſs through the point at the ſide of the ſaid hole, that is next to the head, A B. The mortiſe of the trail-tranſom is equal in length to the trail itſelf; its height is equal to one diameter of the ſhot, and it is parallel to the upper ſide, N O, of the trail. Its lower ſide, if produced, would paſs through the point, P.

All theſe mortiſes, viz. of the breaſt-tranſom, the bed-tranſom, the centre-tranſom, and the trail-tranſom, are divided by horizontal right lines into four equal parts, the upper one of which is ſunk or let in half an inch into each of the cheeks, the two middle ones to the depth of two-thirds of the thickneſs of one of the cheeks, and the lower one not at all.

And the following is the conſtruction of the plan of a travelling gun-carriage. See *fig.* 12.

Draw any indefinite right line, A B. In it take the right line, C D, equal to the diſtance from the centre of the trunnions to the extremity of the baſe-ring of the gun. Through the points C, D, draw right lines perpendicular to A B, and let them be produced indefinitely. On that drawn through the point C, take C E, C F, contrary ways and equal each to the radius of the ſecond reinforce-ring. And on that drawn through the point D, take D K, D L, alſo contrary ways, and equal each to the radius of the baſe-ring. Then right lines drawn through the points F, L, and E, K, will determine or aſcertain the width of the carriage within; and if two right lines be drawn parallel to theſe, and at a diſtance from them reſpectively equal to the length of either of the trunnions they will give the equal thickneſſes of the cheeks Q P, R S.

The poſitions of the trunnion-holes m, n, are aſcertained by ſetting off a diſtance both from the point E, and the point F, equal to half the diameter of either of the trunnions. The breaſt-tranſom, Y, muſt be drawn with a breadth equal to one diameter of the ſhot, and with its inſide in a line with the fore parts of the trunnion-holes. Take C A equal to r B in the laſt figure. Then a right line, R A Q, perpendicular to A B, will determine the breaſt of the carriage; and its total length is aſcertained by the immediately preceding figure.

If two diameters be ſet off from the right line K L, we ſhall get the hind part of the centre-tranſom, V, the width or breadth of which as well as that of the bed-tranſom is equal to one diameter of the ſhot. The diſtance between theſe is equal to two diameters, and the poſition and breadth of the trail-tranſom are determined as in the immediately preceding figure. In the middle of this tranſom is the pintle-hole, of an oval form, wider above than below, in order that the pintle may have room to play in it when the carriage is moving on or going over uneven ground. The bed, w, is a piece of an inch and half-board one foot broad and is ſunk or let down into the bed and centre-tranſoms. The plane of the fore-part of the axle-tree would, if produced, paſs through the centres of the trunnion-holes. There is a board fixed with one end on the axle-tree and the other on the bed-tranſom, for laying hay, ſtraw, &c. upon for wadding. From about one diameter and a half from the centre-tranſom, to about a diameter from the trail, the breadth or thickneſs of each of the cheeks is diminiſhed by a ſixth part of the ſame.

This is the conſtruction that has been commonly obſerved and made uſe of for travelling carriages. But Mr. Muller has given a general conſtruction for them to ſuit his conſtruction of guns, the lengths of which he ſuppoſes to be reſpectively equal to 20 or 21 diameters of their ſhot.

The general dimenſions of travelling gun carriages, according to this conſtruction, are the following. See *fig.* 11. The length, A d, of the plank is equal to ſeven feet and a half together with twelve diameters of the gun's ſhot. The height, A B, of each of the cheeks is equal to three diameters and a quarter. B b is equal to half a diameter, and the height, D C, at the centre is equal to 70 ſuch equal parts as thoſe, of which the ſaid diameter contains 24. The length of the trail is equal to three diameters, and its height, M N, to two. The breadth, F H, of the axle-tree is equal to two diameters, and the reſt of the dimenſions are regulated by the ſize of the gun.

The following is his conſtruction of travelling carriages for ſuch guns. See *fig.* 11.

Make the length, A d, of the plank for either cheek of the carriage equal to ſeven feet and a half together with 10 diameters of the ſhot of the gun; its height, A b, equal to three diameters and three quarters of a diameter; and the height, A B, of the cheek itſelf equal to three diameters and a quarter. Take B C equal to eight diameters, together with 20 ſuch parts as thoſe, of which one diameter of the ſhot contains 24; from the point, A, as centre with the radius, A C, deſcribe an arc, in which apply as a chord C D, equal to 70 ſuch parts, and draw the right lines A D, B C. On B C ſet off B E equal to the head A B, or the height of the cheek, and from the point, E, ſet off towards the point, B, the right lines, E r, r S, equal each to nine ſuch parts, making E S equal to 18 ſuch parts or the width of the trunnion-hole, of which the centre is about a quarter of an inch below B C or the upper ſurface of the cheek. From the point r, draw the right line r F, perpendicular to A D, and on A D take F H equal to 30 ſuch parts for the breadth of the axle-tree, which is let in or ſunk into the cheek about an inch. On F H conſtitute a ſquare, and from the interſection, I, of its diagonals as centre with a radius of 29 inches deſcribe an arc, which will repreſent a part of one of the wheels. Apply a ſtraight ruler touching this arc ſo to the ſaid plank that the diſtance M L, between the points, M, L, where its edge coincides with the edges of the plank, may be equal to three diameters, and from theſe points draw M N, L O, perpendicular to K M, and equal each of them to two diameters. Then if the right lines C N, N O, and D M, be drawn and the under part of the trail be deſcribed as above pointed out from R, the biſecting point of the right line, M Q, as a centre, we ſhall have A B C N O P M D A for the outline of the cheek.

And the conſtruction of the plan of ſuch a carriage is as follows. See *fig.* 12.

Draw any indefinite right line, A B. In it take C D equal to ſeven diameters and 17 ſuch parts. Through the points, C, D, draw right lines, E F, K L, at right angles to A B, making C E, C F, equal each of them to 27.5 ſuch parts, and D K, D L, equal each of them to 32.5 ſuch parts. Then right lines drawn through the points F, L, and E, K, will determine or aſcertain the width of the carriage on the inſide. And if parallel to theſe lines two other right lines be drawn at the diſtance from them reſpectively of 18 ſuch parts, we ſhall have the thickneſſes of the cheeks and the outſide width of the carriage.

The poſitions, m, n, of the trunnion-holes are determined by ſetting off on both ſides of the points, E, F, nine ſuch parts for the radius of each of the trunnions. And if C a be taken equal to r B in the laſt *fig.* or *fig.* 11. the line, R Q, drawn at right angles to A B, will determine the breaſt of the carriage; and its total length, a I, is aſcertained from the ſaid figure. The other parts of the conſtruction are the ſame as thoſe above.

Figure 13. is the elevation of a ſix-pounder travelling carriage with the irons marked on it, and *figure* 14. is the plan of the ſame.

*Field-carriages* are ſhorter and much lighter than thoſe above mentioned, and deſcribed, being in theſe reſpects proportioned to the weights and lengths of the pieces mounted on them. They are nearly in the ſame form, however, but have their wheels eight inches lower, which reduction of height makes them perhaps lower than they ought to be.

Their dimenſions are the following:

| Calibers or natures of the guns | | 24 Pounder | 12 Pounder | 6 Pounder |
|---|---|---|---|---|
| | | Inches and Decimals. | Inches and Decimal. | Inches and Decimals. |
| Plank | Length | 108.0 | 106.0 | 94.0 |
| | Height | 15.6 | 14.0 | 12.4 |
| | Thickneſs | 14.5 | 3.7 | 3.0 |
| Cheeks | Height before | 14.5 | 12.7 | 11.0 |
| | Ditto at the centre | 12.0 | 10.9 | 9.8 |
| | Ditto at the trail | 10.0 | 9.2 | 8.4 |
| Length of the trail | | 11.0 | 10.5 | 10.0 |
| Length from head to centre | | 50.0 | 45.0 | 40.0 |
| Width within | Before | 11.5 | 10.7 | 10.0 |
| | Behind | 17.0 | 15.0 | 13.0 |
| Lockers | Length | | | 23.0 |
| | Breadth | | | 13.3 |
| | Depth | | | 4.3 |
| Length of the trail hand-ſpike | | 63.0 | 60.0 | 57.0 |
| Diameter of ditto at the trail | | 4.0 | 3.5 | 3.0 |
| Elevation ſcrew | Handles in length | | 5.0 | 4.0 |
| | Height | | 10.5 | 9.0 |
| | Diameter | | 2.0 | 1.5 |
| | Diameter of ſocket | | 3.0 | 2.5 |
| Wheel | Height | 50.0 | 50.0 | 50.0 |
| Length of each nave | | 15.0 | 13.0 | 12.7 |
| Diameter of ditto | Body | 13.0 | 11.0 | 10.6 |
| | Middle | 14.0 | 12.0 | 11.6 |
| | Linch | 12.0 | 11.0 | 10.0 |
| Felloes | Height | 4.7 | 4.0 | 3.6 |
| | Breadth | 3.3 | 2.8 | 2.4 |
| Spokes | Breadth | 2.0 | 1.8 | 1.7 |
| | Thickneſs | 3.5 | 3.2 | 2.9 |
| Length of axle-tree | | 75.0 | 72.0 | 73.4 |
| Body | Length | 39.0 | 40.0 | 42.0 |
| | Breadth | 6.0 | 5.5 | 5.0 |
| | Height | 8.0 | 7.0 | 6.0 |
| Length of each arm | | 18.0 | 16.0 | 15.7 |
| Diameters | Body | 6.0 | 5.5 | 5.0 |
| | Linch | 4.0 | 3.0 | 3.5 |

The length of the plank for either cheek in one of theſe carriages is equal to four feet, together with thirteen diameters of the ſhot. And the width within varies with the thickneſs of the metal in the piece.

The conſtruction for travelling carriages anſwers likewiſe for field carriages, if theſe dimenſions be made uſe of inſtead of thoſe delivered above. See *figs.* 15 and 16. The latter, however, differ from the former in the following particulars.

They have no bed-tranſoms, as ſcrews, inſtead of wedges, are made uſe of for elevating or depreſſing them; for which reaſon the centre tranſom in each of them is two diameters broad, and but one thick, and is ſo placed in the middle of the height of the cheeks, that the neck of the caſcable anſwers to the middle of the breadth of the tranſom, where the ſcrew is fixed.

On each ſide of one of theſe carriages there is a box or locker, about twenty-three inches, or two feet long, with its upper ſurface even with, or rather about an inch above the upper part of the axle-tree, and extending from thence towards the trail. Theſe boxes, or lockers, ſerve for carrying ſhot on a march, and are covered each of them by another box holding cartridges, which ſlides on and is faſtened with a bolt.

The iron-work in one of theſe carriages is nearly the ſame as that in a travelling carriage, but not quite ſo ſtrong. It has only one garniſh-bolt, and no garniſh-nails. The eye-bolt next to the joint-bolt paſſes through the axle-tree band behind and not before as in other carriages, and the fore part of this band is only faſtened by the fore eye-bolt. The draught-hooks are fixed ſometimes to the breaſt-tranſom plates, and ſometimes to the axle-tree. But the nearer they are fixed on a level with the breaſts of the horſes the better. There are ſometimes hooks to the trail tranſom-plates, and ſometimes nails about four inches long. The waſhers have alſo hooks, to which are faſtened the ropes, by which the gunners or their aſſiſtants drag the gun along.

*A galloper-carriage* is for a pound and a half gun. *Fig.* 19 is an elevation of one, and *fig.* 20 a plan of one. The following are its dimenſions.

| | Feet | Inches |
|---|---|---|
| Total length of each ſhaft | 11 | 0.27 |
| From the fore end to the fore croſs-bar | 6 | 4.16 |
| From the hind end to the round part | 5 | 0.11 |
| Height at the hind end | 0 | 6.0 |
| Height at the fore end | 0 | 3.0 |
| Breadth behind and before | 0 | 3.5 |
| Breadth in the middle | 0 | 4.5 |
| Inſide width behind | 2 | 6.5 |
| Do. at the fore croſs-bar | 2 | 4.0 |
| Do. at the fore end | 2 | 1.0 |
| From the hind end to the axle-tree | 0 | 11.0 |
| Croſs bar from the hind end | 0 | 3.12 |
| Length of each cheek | 4 | 2.11 |
| Breadth of do. | 0 | 2.5 |
| Height of do. | 0 | 6.5 |
| Inſide width before | 0 | 8.0 |
| Do. behind | 0 | 11.5 |
| Total length of the axle-tree | 6 | 4.18 |
| Length of the body of do. | 3 | 6.5 |
| Length of each arm | 1 | 4.84 |
| Breadth of the body | 0 | 5.0 |
| Height of do. | 0 | 6.0 |
| Greateſt diameter of each arm | 0 | 5.0 |
| Leaſt diameter of do. | 0 | 3.3 |
| Diameter of each wheel | 4 | 3.13 |
| Length of the nave | 1 | 1.0 |
| Diameter of the body of do. | 0 | 11.0 |
| Diameter of the middle of do. | 1 | 0.0 |
| Do. of the linch of do. | 0 | 10.0 |
| Breadth of each ſpoke | 0 | 1.5 |
| Thickneſs of do. | 0 | 3.0 |
| Breadth of each felloe | 0 | 3.0 |
| Thickneſs of do. | 0 | 4.5 |

The reſt of the dimenſions not inſerted here may be taken from the draughts, *fig.* 19 and 20. A galloper-carriage is made with ſhafts to be drawn, as we have already obſerved, without a limber.

The dimenſions of limbers both for travelling and field-carriages are the ſame, and are the following.

| Nature of the guns. | 24 Pounder. | 12 Pounder | 6 Pounder. | 3 Pounder. |
|---|---|---|---|---|
| | Inc. | Inc. | Inc. | Inc. |
| Diameter of each wheel - - | 48 | 48 | 48 | 48 |
| Length of the nave - - | 16 | 15 | 14 | 10 |
| Diameter of the body of do. - | 13.5 | 13.5 | 12 | 12 |
| Do. of the middle of do. - | 14.0 | 14.0 | 13.0 | 12.5 |
| Do. of the linch of do. - - | 12.0 | 12.0 | 11.0 | 10.0 |
| Breadth of each felloe - - | 4.5 | 4.0 | 3.5 | 3.0 |
| Height of do. - - | 5.0 | 4.5 | 4.0 | 3.5 |
| Breadth of each ſpoke - - | 1.8 | 1.6 | 1.4 | 1.2 |
| Thickneſs of do. - - | 4.0 | 3.5 | 3.0 | 2.5 |
| The length of the axle-tree - | 78 | 76 | 74 | 69 |
| Length of the body of do. - | 40 | 40 | 40 | 43 |
| Height of the body of do. - | 7.6 | 7.0 | 6.0 | 5.5 |
| Breadth of the body of do. - | 6.0 | 5.5 | 5.0 | 5.0 |
| Length of each arm of do. - | 19 | 18 | 17 | 13 |
| Diameter of the body of do. - | 5 | 4 | 4 | 4 |
| Do. of the linch of do. - - | 4 | 3 | 3 | 3 |
| The length of each ſhaft - - | 94 | 94 | 94 | 94 |
| Breadth of hind end of do. - | 6 | 5.5 | 5 | 4 |
| Do. of fore end of do. - - | 3 | 3 | 2.5 | 2.5 |
| Height of hind end of do. - | 3.3 | 3 | 3 | 3 |
| Do. of fore end of do. - - | 3 | 3 | 2.5 | 2.5 |
| Length of the beams - - | 110 | 110 | 110 | 110 |
| Breadth of do. at hind end - | 4.5 | 4.0 | 3.5 | 3.0 |
| Do. of do. at fore end - - | 4.0 | 3.5 | 3.0 | 2.5 |
| The height of the bolſter - | 12.5 | 10.0 | 8.0 | 7.0 |
| The length of do. - - | 40 | 40 | 40 | 43 |
| The breadth of do. - - | 6 | 5.5 | 5.0 | 5.0 |
| Breadth of the fore croſs-bar - | 4.5 | 4.0 | 3.5 | 3.0 |
| The height of do. - - | 1.5 | 1.5 | 1.5 | 1.5 |
| Breadth of hind croſs-bar - | 3.5 | 3.5 | 3.5 | 3.0 |
| The height of do. - - | 1.5 | 1.5 | 1.5 | 1.5 |
| Diſtance of axle-tree from the fore croſs-bar - - - | 11.5 | 11.5 | 11.5 | 11.5 |

The ſhafts of limbers are about two feet open before, two feet ten inches in the middle, and a little leſs near the axle-tree according as the wood, out of which they are made, happens to be more or leſs crooked. For it ought never to be cut acroſs the grain for fear of weakening it too much. The height of the bolſter diminiſhes towards both ends, as in *fig.* 22. That given in the immediately preceding table is for the middle of it.

The following are the names of the irons, or pieces of iron-work in the ſhafts and beams of limbers with the number of each. See *fig.* 21, 22, and 23.

| | | |
|---|---|---|
| *a.* | Limber-bolt - - - - | 1 |
| *b.* | Shaft-rings - - - - | 2 |
| *c.* | Shaft-pins with chains - - - - | 2 |
| *d.* | Breech-hooks - - - - | 2 |
| *e.* | Ridge-chain with hook and loop - - - | 1 |
| *f.* | Limber-chain with hook and rings - - | 1 |
| *g.* | Single fore lock keys - - - | 4 |
| *h.* | Diamond-headed nails - - - | 8 |
| *k.* | Dog-nails - - - - - | 6 |
| *l.* | Bolſter-hoops - - - - - - | 2 |
| *m.* | The pintle - - - - - | 1 |
| *n.* | The pintle-waſhers - - - - | 2 |
| | Stubs for bolſter-hoops - - - - | 8 |

The irons, or pieces of iron-work in the wheels and axle-tree are the ſame in form and number as thoſe mentioned above, but ſomewhat lighter and ſmaller, and need not therefore be ſpecified.

*Howitzer-carriages* are for mounting and tranſporting howitzers on. Thoſe for the 6 and 5.8 inch howitzers are made with ſcrews for elevating or depreſſing them in the ſame manner as the light ſix pounders are elevated or depreſſed. For this reaſon they are made without a bed, and the centre-tranſom in each of theſe is nine inches broad, for fixing the ſcrew on inſtead of four, the breadth of it in thoſe that are without ſcrews. In them that is alſo between the trail and centre-tranſom, a tranſom-bolt, which is not in others, becauſe the centre-tranſom muſt be ſo made as to be taken out in order that the howitzer may be elevated to any angle under 90 degrees.

The iron-work of a howitzer-carriage is the ſame as that of a field-carriage, with this exception, that in it there are only four garniſh nails, viz. two of a ſide, becauſe it is ſo ſhort as not to admit of more. The wheels and axle-tree are the ſame as thoſe of an 18 and 12 pounder-carriage.

The following are the dimenſions of an eight-inch howitzer-carriage.

| | | Feet | In |
|---|---|---|---|
| The length of each check - - | | 8 | 5 |
| The thickneſs of do. - - - | | 0 | 4.5 |
| The height of do. before - - | | 1 | 6 |
| Do. of do. at the centre - - | | 1 | 4 |
| Do. of do. at the trail - - | | 1 | 2 |
| Length of the trail - - | | 1 | 3 |
| Height of the plank - - | | 1 | 6 |
| Diſtance from the head to the centre - | | 3 | 7 |
| Do. of trunnions from the head - - | | 0 | 9 |
| Breaſt-tranſom | Length - - - | 1 | 2.5 |
| | Height - - | 0 | 2 |
| | Thickneſs - - | 0 | 4.5 |
| Centre-tranſom | Length - - | 1 | 4.5 |
| | Height - - | 0 | 2.5 |
| | Thickneſs - - | 0 | 4.5 |
| Trail-tranſom | Length - - | 1 | 7 |
| | Breadth - - | 1 | 3 |
| | Thickneſs - - | 0 | 4.5 |

*Of mortar-beds.*

A mortar-bed anſwers for mounting a mortar on as a gun carriage does for mounting a cannon on. Land mortar-beds are commonly made ſolid, each of them conſiſting of four pieces of timber well ſecured and ſtrongly faſtened together with iron-work, except thoſe for royals and coehorns, each of which is made out of a ſingle block.

| Bores of the mortars and natures of the beds - - | | 13 Inch | 10 Inch | 8 Inch | 5.8 Inch | 4.6 Inch |
|---|---|---|---|---|---|---|
| | | Inc. | Inc. | Inc. | Inc. | Inc. |
| Lower bed | Length - | 84 | 66 | 50 | 0 | 0 |
| | Breadth - | 33 | 26 | 20 | 0 | 0 |
| | Height - | 13 | 10 | 9 | 0 | 0 |
| Upper bed | Length - | 83 | 65 | 49 | 31.5 | 28.5 |
| | Breadth - | 32 | 25 | 19 | 16 | 14 |
| | Height - | 13 | 12 | 11 | 10 | 9 |
| Breadth of quarter round - | | 3 | 2.5 | 2.5 | 0 | 0 |
| Do. of the ogee and fillet - | | 4 | 3.5 | 3 | 0 | 0 |
| The length of the cavity - | | 20 | 16 | 12 | 8 | 5.7 |
| Diſtance of the trunnion-holes from the fore end - | | 31 | 20 | 15.5 | 13.3 | 11.7 |
| The diameter of the trunnion-holes - - - | | 7.2 | 6.4 | 5.4 | 3.4 | 2.4 |
| The depth of the trunnion-holes - - | | 7 | 6 | 5 | 3.2 | 2.2 |

The diſtance of the trunnion-holes is meaſured from the quarter round, and not from the very end of the bed. The joint of the two pieces of the upper bed of a 13, 10 and 8 inch mortar-bed is ſo contrived as not to be directly over the joint of the two pieces in the lower bed.

The following are the names and numbers of the irons in a 13, 10, or 8 inch mortar bed. See *fig.* 24, 25, 26, and 27.

| | |
|---|---|
| *a.* Cap-ſquares - - - - | 2 |
| *b.* Eye-bolts - - - - | 2 |
| *c.* Joint-bolts - - - - | 2 |
| *d.* Under and upper bed-bolts - - - | 9 |
| *e.* Dowel-bars - - - | 4 |
| *g.* Rings with bolts - - - | 4 |
| *h.* Reſerve-bars - - - - | 2 |
| *k.* End rivetting plates - - - | 2 |
| *l.* Middle plate - - - - | 1 |
| *m.* Rivetting bolts - - - - | 6 |
| *n.* Square rivetting bolts - - - | 12 |
| *p.* Traverſing bolts - - - | 6 |
| *q.* Keys, chains, and ſtaples - - - | 2 |

Names and numbers of irons in a royal or coehorn bed.

| | |
|---|---|
| *a.* Cap-ſquares - - - - | 2 |
| *b.* Eye-bolts - - - - | 2 |
| *c.* Joint-bolts - - - - | 2 |
| *d.* Rivetting bolt with ring - - - | 1 |
| *f.* Handles with ſtarts - - - | 2 |
| *g.* Square rivetting plates - - - | 5 |
| *h.* Keys, chains, and ſtaples - - - | 2 |

Mr. Muller gives the following dimenſions for mortar beds to ſuit his general conſtruction of three kinds of mortars, ſuppoſing, as in his conſtruction of them, the diameter of the bore to be always divided into thirty equal parts, as a ſcale to go by.

| Diameter of the bore in each kind divided into | 30 equal parts. | | 30 equal parts. | | 30 equal parts. | |
|---|---|---|---|---|---|---|
| | Diameter of the bore. | Parts of the diameter. | Diameter of the bore. | Parts of the diameter. | Diameter of the bore. | Parts ot the diameter. |
| Lower bed: Length | 6 | 0 | 5 | 10 | 4 | 25 |
| Lower bed: Breadth | 2 | 10 | 2 | 2 | 1 | 26 |
| Lower bed: Thickneſs | 0 | 28 | 0 | 25 | 0 | 22.5 |
| Upper bed: Length | 5 | 28 | 5 | 8 | 4 | 23 |
| Upper bed: Breadth | 2 | 8 | 2 | 0 | 1 | 24 |
| Upper bed: Thickneſs | 0 | 28 | 0 | 25 | 0 | 22.5 |
| The breadth of the ogee | 0 | 6 | 0 | 5 | 0 | 4.5 |
| The breadth of the quarter round the fillet | 0 | 6 | 0 | 5 | 0 | 4.5 |
| The diameter of each of the trunnion holes | 0 | 14 | 0 | 13 | 0 | 12 |
| The depth of each of the trunnion holes - | 0 | 10 | 0 | 9.5 | 0 | 9 |
| The interval between them | 1 | 5 | 1 | 5 | 1 | 4 |
| The length of each of them | 0 | 15 | 0 | 14 | 0 | 13 |

The dimenſions of the firſt of theſe kinds of mortar beds correſpond nearly to thoſe of the mortar beds that have been generally in uſe.

The general dimenſions of the iron work for ſuch beds are the following:

| | Diameters of the bore. | Parts of the diameter divided into 30. | Diameters of the bore. | Parts of the diameter divided into 30. | Diameters of the bore. | Parts of the diameter divided into 30. |
|---|---|---|---|---|---|---|
| Of each cap ſquare - Length - | 1 | 18 | 1 | 14 | 1 | 9 |
| Of each cap ſquare - Breadth - | 0 | 12 | 0 | 10 | 0 | 8 |
| Of each cap ſquare - Thickneſs - | 0 | 3 | 0 | 2.5 | 0 | 2 |
| Fore end from the trunnion-hole - - | 0 | 16 | 0 | 14 | 0 | 13 |
| Of each eye-bolt-head Height - - | 0 | 8 | 0 | 7 | 0 | 6 |
| Of each eye-bolt-head Breadth - | 0 | 7 | 0 | 6 | 0 | 5 |
| Of each eye-bolt-head Thickneſs - | 0 | 3.5 | 0 | 3.5 | 0 | 3 |
| The diameter of each joint bolt head - | 0 | 11 | 0 | 8.5 | 0 | 7.5 |
| The thickneſs of ditto - - - | 0 | 3.5 | 0 | 3.5 | 0 | 3 |
| Diſtance from the trunnion-hole - - | 0 | 10.5 | 0 | 9.5 | 0 | 7.5 |
| The length of each traverſing-bolt - - | 0 | 23 | 0 | 20 | 0 | 16 |
| The diameter of the head of ditto - - | 0 | 4.5 | 0 | 3.5 | 0 | 3 |
| The diameter of the bolt itſelf - - | 0 | 3 | 0 | 2 | 0 | 2 |
| The diſtance from the end - - | 1 | 2 | 0 | 29 | 0 | 24 |
| Its diſtance from below - - - | 0 | 12 | 0 | 11 | 0 | 10 |
| Of the middle plate - Length - - | 2 | 8 | 2 | 0 | 1 | 24 |
| Of the middle plate - Breadth - | 0 | 9 | 0 | 7 | 0 | 6 |
| Of the middle plate - Thickneſs - | 0 | 1.6 | 0 | 1.5 | 0 | 1.5 |
| The length of the bed-bolt - - | 2 | 10 | 2 | 2 | 1 | 26 |
| The diameter of ditto - - - | 0 | 3 | 0 | 2.5 | 0 | 2 |
| The diameter of the ring - - - | 0 | 14 | 0 | 12 | 0 | 10 |
| The thickneſs of the ring - - | 0 | 3 | 0 | 2.5 | 0 | 2 |

| | Diameters of the bore. | Parts of the diameter divided into 30. | Diameters of the bore. | Parts of the diameter divided into 30. | Diameters of the bore. | Parts of the diameter divided into 30. |
|---|---|---|---|---|---|---|
| The diameter of each rivetting bolt | 0 | 3 | 0 | 2.5 | 0 | 2 |
| The diameter of the ring of ditto | 0 | 3 | 0 | 2.5 | 0 | 2 |
| Diſtance from the ends of the plates | 0 | 6 | 0 | 5 | 0 | 4 |
| Diameter of the bed bolts burs | 0 | 6 | 0 | 5 | 0 | 4 |
| Rivetting plates — Length | 1 | 27 | 1 | 19 | 1 | 14 |
| Rivetting plates — Breadth | 0 | 8 | 0 | 6 | 0 | 5 |
| Rivetting plates — Thickneſs | 0 | 1 | 0 | 1 | 0 | 1 |
| From the quarter-round | 0 | 8 | 0 | 6 | 0 | 5 |
| Diameter of the traverſing bolt-plates | 0 | 11 | 0 | 10 | 0 | 10 |

He ſuppoſes theſe mortars, contrary to what has been the common practice, to be ſo placed in their beds as to be moveable, and capable of being raiſed from an angle of 10 degrees to any under 90, and alſo the cavity in each bed to be ſo made as to receive the wedges for raiſing the mortar with.

*Sea-Mortar-beds* are likewiſe made ſolid with very ſtrong timbers but differ from the land-mortar-beds in point of form or figure, and have each of them a hole in the middle, or centre, for receiving the pintle-pin, or ſtrong iron bolt, round which the bed may turn. They are placed on ſtrong wooden frames fixed into the bomb ketches, to which the pintles are faſtened. The fore-part of a ſea-mortar-bed is an arc of a circle deſcribed from the centre of the pintle-hole.

The following are their dimenſions in inches. See *fig.* 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38 and 39.

| Diameters of the bores | 13 inch<br>inches. | 10 inch<br>inches. |
|---|---|---|
| The lengths of the beds | 94 | 84 |
| The breadths of the beds | 54 | 47 |
| The heights of the beds | 27 | 23 |
| Diſtances of the pintle-holes from the fore-ends | 39 | 32 |
| Diameters of the pintle-holes | 6.5 | 6.5 |
| Diſtances of the trunnions from the fore-ends | 46 | 42.5 |
| Diameters of the trunnion-holes | 10 | 8 |
| Depths of the trunnion-holes | 8 | 5 |
| Diameters of the circular beds | 59 | 59 |
| Heights of the circular beds | 8 | 6 |
| Diſtances to the bed bolſters | 16 | 15 |
| Depths of the cavities | 15 | 12 |
| Their openings above | 30 | 21 |
| The lengths of the bed-bolſters | 53 | 44 |
| Their lengths below | 29 | 22.1 |
| Their breadths | 14 | 12 |

And the names and numbers of the irons in both the 13-inch mortar-bed and 10-inch mortar-bed are the following.

| | |
|---|---|
| *a.* Cap-ſquares | 2 |
| *b.* Eye-bolts | 6 |
| *c.* Loop-bolts | 4 |
| *d.* Traverſing-bolts | 4 |
| *e.* Middle-plate | 1 |
| *f.* Rivetting-plate | 1 |
| *g.* Rivetting bolts | 6 |
| *h.* Croſs-bed bolts | 7 |
| *l.* Square rivetting plates for ditto | 7 |
| *k.* Down bed-bolts | 15 |
| *m.* Bed-bolſter plates | 2 |
| Keys, chains and ſtaples | 6 |
| Nails to the bed-bolſter bed | 4 |
| Bed-bolſter rings with loops | 2 |

*Tumbrels*, as we have already obſerved, are carriages with two wheels, only are commonly made uſe of for carrying tools for miners, artificers, and pioneers, and ſometimes the money of the army. The dimenſions of one are the following. See *fig.* 40 and 41.

| | inches. |
|---|---|
| The diameter of each wheel | 60 |
| The length of the nave | 15 |
| The diameter of the body of ditto | 12 |
| Ditto of middle of ditto | 13 |
| Ditto of linch of ditto | 10 |
| The breadth of each ſpoke | 2.2 |
| The thickneſs of ditto | 3.3 |
| The breadth of each of the felloes | 4.5 |
| The thickneſs of ditto | 3.5 |
| The length of the axle-tree | 76 |
| The length of the body of ditto | 42 |
| The breadth of ditto of ditto | 5 |
| The height of ditto of ditto | 6.7 |
| The length of each arm | 17 |
| The diameter of the body of ditto | 4.5 |
| Ditto of the linch of ditto | 3 |
| The total length of each ſhaft | 147 |
| The diſtance from the hind end of each to the croſs-bar | 7 |
| Ditto from the hind croſs-bar to the fore end | 62 |
| Diſtance from the fore-cut to the fore-end | 78 |
| The breadth of ditto behind | 4 |
| Ditto of ditto at the fore-cut | 4.5 |
| Ditto of ditto in the middle | 3.5 |
| Ditto of ditto at the fore-end | 2.3 |
| Height of ditto from the hind end to the fore-cut | 3.5 |
| Ditto of ditto at the fore-end | 2.3 |
| Inſide width behind and at the fore-cut | 34 |
| Ditto in the middle | 35 |
| Ditto at the fore end | 25 |
| Croſs-bars — Breadth | 3.5 |
| Croſs-bars — Thickneſs | 2 |
| Croſs-bars — Length | 31 |

| | | Inches. |
|---|---|---|
| Fore-cut | Length | 51 |
| | Breadth | 4 |
| | Thickneſs | 2 |
| Raves | Length | 62 |
| | Breadth | 2 |
| | Thickneſs | 3 |
| Standards | Length | 24 |
| | Breadth | 2.8 |
| | Thickneſs | 1.3 |
| Head-bars | Length | 36 |
| | Breadth | 1.2 |
| | Thickneſs | 1.8 |
| Uprights | Length | 22 |
| | Breadth | 1.3 |
| | Thickneſs | 3 |

And the following are the irons in one of them.

| The irons of a pair of wheels and axle-tree complete. | N° |
|---|---|
| Axle tree pins with rings and keys | 2 |
| Fore-cut pins | 2 |
| Breech-hooks | 2 |
| Shaft-rings | 2 |
| Shaft-pins with chains and ſtaples | 2 |
| Ridge chain with hook and loop | 1 |
| Bail ſtaples | 6 |

*Block-carriages*, as we have obſerved above, are chiefly for conveying mortars and their beds from one place to another.

The dimenſions of one of them are the following. See *fig.* 42, 43, and 44.

| | inches. |
|---|---|
| The height of each fore-wheel | 48 |
| The length of the nave | 15 |
| The diameter of the body of ditto | 14 |
| Ditto of the middle of ditto | 15 |
| Ditto of the linch of ditto | 13 |
| The height of each felloe | 5.5 |
| The breadth of ditto | 3.5 |
| The breadth of each ſpoke | 2 |
| The thickneſs of ditto | 3 |
| The height of each hind-wheel | 60 |
| The length of its nave | 17 |
| The diameter of the body of ditto | 14 |
| The diameter of the middle of ditto | 15 |
| The diameter of the linch of ditto | 13 |
| The height of each of its felloes | 6.5 |
| The breadth of each felloe | 4 |
| The breadth of each of its ſpokes | 4 |
| The thickneſs of each of its ſpokes | 2.3 |
| The total length of the fore axle-tree | 77 |
| The length of its body | 39 |
| The breadth of its body | 6.5 |
| The height of its body | 8 |
| The length of each of its arms | 19 |
| The diameter of the body of each of ditto | 6 |
| The diameter of the linch of each | 4 |
| The length of the bolſter | 49 |
| The breadth of the bolſter | 6.5 |
| The height of ditto | 7 |
| The total length of the hind axle-tree | 77 |
| The length of the body of ditto | 37 |
| The breadth of the body of ditto | 7 |
| The height of the body of ditto | 8.7 |
| The length of each arm of ditto | 20 |
| The diameter of the body of each of ditto | 6 |
| The diameter of the linch of ditto | 4.8 |
| The length of the bolſter | 47 |
| The breadth of the bolſter | 7 |
| The height of ditto | 8 |
| The length of each ſide-piece | 132 |
| The breadth of ditto | 6.5 |
| The height of ditto | 6.5 |
| The diſtance between the axle-trees | 72 |
| The ſide pieces project equally by | 24 |
| The length of each ſhaft | 96 |
| The breadth of each behind | 5.3 |
| The breadth of each in the middle | 6 |
| The breadth of each before | 3 |
| The length of the ſtraight bar | 19 |
| The opening behind | 28.5 |
| Ditto in the middle | 32.5 |
| Ditto before | 24 |
| The height of each ſhaft | 3 |
| The length of the rider | 46 |
| The breadth of the rider | 6.5 |
| The height of ditto | 8 |
| The interval between the ſide pieces | 12 |
| The ſide pieces are let into the rider and hind bolſter | 2 |

And the irons in ſuch a carriage are the following.

| Irons complete for wheels, axle-tree, and ſhafts. | N° |
|---|---|
| Iron bar for faſtening the hind axle-tree to the fore one | 1 |
| Bolts for fixing this bar to the axle-trees | 2 |
| Bolſter-bolts | 4 |
| Hooks faſtened to the ſide-pieces with two bolts and bars | 4 |
| Bar for faſtening the ſide pieces to the middle | 1 |
| Staples for the ſhafts and iron bands with loops | 2 |
| Loops, one faſtened to the rider, and another to the hind bolſter | 2 |

The principal uſe of a *truck carriage*, as we have already obſerved, is to carry timber and other heavy articles from one place to another, and ſometimes guns and mortars, where their own carriages cannot go.

The following are the dimenſions of one. See *fig.* 45, 46, 47, and 48.

| | Inches. |
|---|---|
| The length of the body of the fore axle-tree | 32 |
| The breadth of the body of do. | 5 |
| The height of the body of do. | 11.5 |
| The length of each arm of do. | 6.5 |
| The diameter of each arm of do. | 3 |
| The length of the body of the hind axle-tree | 32 |
| The breadth of the body of do. | 6 |
| The height of the body of do. | 7.8 |
| The length of each arm of do. | 6.5 |
| The diameter of each arm of do. | 3 |
| The length of each ſide-piece | 100 |
| The breadth of each ſide-piece | 10 |
| The height of each ſide-piece | 2.5 |
| The interval between them | 10 |
| Interval between the ſide-pieces and fore axle-tree | 15 |
| Ditto between the ſide-pieces and hind axle-tree | 15 |
| The length of the fore bolſter | 32 |
| The breadth of do. | 5 |
| The height of do. | 6 |
| The length of each ſhaft | 96 |
| The height of each ſhaft | 3.3 |
| The opening of do. near the bolt | 23 |
| Ditto in the middle | 35 |
| Ditto before | 24 |
| The breadth of each ſhaft before | 3 |
| The breadth of each in the middle | 4 |
| The breadth of each at the bolt | 3.5 |

Diſtance

| | | Inches. |
|---|---|---|
| Diſtance from the end to the ſtraight croſs-box | | 12 |
| Fore-guide | Length | 30 |
| | Breadth | 21 |
| | Height | 4 |
| | Interval | 10 |
| The diameter of each truck | | 25 |
| The thickneſs of each truck | | 4 |
| The breadth of the croſs-piece fixed to the fore end of the ſide-pieces | | 5 |
| The height of do. before | | 3 |
| The height of do. behind | | 1.5 |
| The breadth of the croſs-piece under the ſide-pieces behind the fore-boltter | | 10 |
| The thickneſs of do. | | 1.5 |

The plan and elevation of the carriage ſhew the iron-work ſufficiently.

The following are the dimenſions of a *ponton*, or *ponton carriage*.

| | | |
|---|---|---|
| The diameter of each wheel both behind and before | | 63 |
| The length of each nave | | 15 |
| The diameter of the body of do. | | 14 |
| The diameter of the middle of do. | | 15 |
| The diameter of the linch of do. | | 12 |
| The breadth of each felloe | | 4 |
| The height of do. | | 4.5 |
| The breadth of each ſpoke | | 2 |
| The thickneſs of do. | | 3.5 |
| The length of each axle-tree | | 86 |
| The length of the body of do. | | 46 |
| The breadth of the body of do. | | 6 |
| The height of the body of do. | | 8.5 |
| The length of each arm of do. | | 18 |
| The diameter of the body of each arm | | 6 |
| The diameter of the linch of do. | | 3.8 |
| The length of each of the under ſide-pieces | | 210 |
| The breadth of do. | | 7 |
| The height of do. | | 6 |
| The length of each of the upper ſide-pieces | | 206 |
| The breath of do. | | 5 |
| The height of do. | | 2.6 |
| Of the fore and hind croſs-bars | Breadth | 6.5 |
| | Height | 3.5 |
| | Length | 52 |
| The diſtance of the centre of the fore axle-tree from the fore end | | 10 |
| The diſtance of the centre of the hind axle-tree from the hind-end | | 9.3 |
| Opening between the upper ſide-pieces | | 51 |
| Ditto between the under ſide-pieces | | 18 |
| The diſtance of the fore-ſupporter from the fore-end | | 45 |
| The diſtance of the hind-ſupporter from the hind-end | | 32 |
| The height of each ſupporter | | 12 |

The *artillery-carriage*, commonly called a travelling forge, is the carriage of a ſort of portable ſmith's ſhop, at which all kind of ſmith's work is done in camp, and even on a march. Formerly it uſed to have but two wheels, and had wooden ſupporters to prop up the forge for working at when in the park of artillery. But now it has uſually four wheels, and is much more convenient.

The dimenſions of ſuch a carriage are the following.

| | Inches. |
|---|---|
| The height of each fore-wheel | 104 |
| The length of its nave | 14 |
| The diameter of the body of do. | 12 |
| The diameter of the middle of do. | 13 |
| The diameter of the linch of do. | 9 |
| The breadth of each felloe | 3 |
| The height of do. | 4 |
| The breadth of each ſpoke | 1.7 |
| The thickneſs of do. | 3 |
| The height of each hind-wheel | 64 |
| The length of its nave | 14 |
| The diameter of the body of do. | 12 |
| The diameter of the middle of do. | 13 |
| The diameter of the linch of do. | 9 |
| The breadth of each felloe | 4 |
| The height of do. | 3 |
| The breadth of each ſpoke | 1.7 |
| The thickneſs of do. | 3 |
| The total length of the fore axle-tree | 76 |
| The total length of the hind axle-tree | 76 |
| The length of the body of each | 42 |
| The breadth of the body of each | 6 |
| The height of the body of each | 7 |
| The length of each arm of each | 17 |
| The diameter of the body of do. | 5 |
| The diameter of the linch of do. | 3 |
| The total length of each ſhaft with the ſide | 203 |
| The breadth of do. behind | 4 |
| The breadth of do. in the middle | 4.5 |
| The breadth of do. before | 2.8 |
| The height of do. behind | 3 |
| The height of do. in the middle | 2.8 |
| The height of do. before | 2 |
| The opening between them before | 25 |
| Ditto in the middle | 35 |
| Ditto behind | 30 |
| The length of each rave | 124 |
| The breadth of do. | 3 |
| The height of do. | 6 |
| The length of each upright | 27 |
| The breadth of do. | 3 |
| The thickneſs of do. | 2.2 |
| The breadth of the fore croſs-bar | 3 |
| The thickneſs of do. | 2.2 |
| The breadth of the hind croſs-bar | 2 |
| The thickneſs of do. | 2.2 |
| Diſtance from the fore end to the fore axle-tree | 23 |
| Diſtance from the hind end to the hind axle tree | 14 |
| Diſtance between | 74 |

An *ammunition-waggon* is an artillery carriage for carrying all ſorts of military ſtores. It has four wheels, has its ſides railed in with ſtaves and raves, and is lined on the inſide with baſket or wicker-work. It carries 12 cwt. and is ſometimes employed for carrying bread. Its dimenſions are the following. See *fig.* 49, 50, 51, and 52.

| | |
|---|---|
| The height of each of the fore wheels | 48 |
| The length of its nave | 13 |
| The diameter of the body of do. | 12 |
| The diameter of the middle of do. | 14 |
| The diameter of the linch of do. | 10 |
| The height of each felloe | 4 |
| The breadth of do. | 3 |
| The breadth of each ſpoke | 1.5 |
| The thickneſs of do. | 3 |
| The height of each of the hind wheels | 60 |
| The length of its nave | 13 |
| The diameter of the body of do. | 12 |
| The diameter of the middle of do. | 14 |
| The diameter of the linch of do. | 10 |
| The breadth of each of its felloes | 3 |
| The height of each of do. | 4 |
| The breadth of each ſpoke | 1.8 |
| The thickneſs of do. | 3.5 |

The

| | | Inches. |
|---|---|---|
| The total length of the fore axle-tree | | 72 |
| The length of its body | | 40 |
| The breadth of its body | | 5 |
| The height or depth of its body | | 6 |
| The length of each of its arms | | 16 |
| The diameter of the body of do. | | 5 |
| The diameter of the linch of do. | | 3 |
| The total length of the hind axle-tree | | 70 |
| The length of its body | | 38 |
| The breadth of its body | | 6.5 |
| The height or depth of its body | | 6 |
| The length of each of its arms | | 16 |
| The diameter of the body of do. | | 5 |
| The diameter of the linch of do. | | 3 |
| The length of the fore-bolſter | | 49 |
| The breadth of do. | | 5 |
| The height or depth of do. | | 6 |
| The length of the hind-bolſter | | 46 |
| The breadth of do. | | 5 |
| The height or depth of do. | | 6 |
| The length of the rider | | 49 |
| The breadth of do. | | 5 |
| The height of do. | | 4.7 |
| Sommers and ſides | Length | 144 |
| | Breadth | 3 |
| | Height | 3 |
| The length of the pole | | 120 |
| Its ſquare before | | 4 |
| Its ſquare behind | | 3 |
| The length of the middle bar | | 40 |
| The breadth of do. | | 3.5 |
| The height or depth of do. | | 6.5 |
| Hind-guide | Length to the axle-tree | 28 |
| | Breadth at the head | 5 |
| | Square at the axle-tree | 3 |
| | Opening at the axle-tree | 24 |
| Fore-guide | Length to the axle-tree | 32.5 |
| | Breadth before | 5 |
| | Breadth behind | 4 |
| | Thickneſs | 3 |
| The length of the ſtraight part | | 20 |
| The length from the axle-tree to the hind end | | 28 |
| Opening | to receive the tongue | 4 |
| | near the axle-tree | 19 |
| | behind | 40 |
| The length of the ſweep-bar | | 50 |
| The breadth of do. | | 3.5 |
| The height or depth of do. | | 2.5 |
| The length of each rave | | 144 |
| The breadth of do. | | 2.2 |
| The height of do. | | 2.2 |
| The length of each ſlate ſtave | | 15.5 |
| The breadth of do. | | 2.5 |
| The thickneſs of do. | | 1 |
| The length of each ſhaft | | 67 |
| The length of the ſtraight part | | 10 |
| The breadth | behind | 3.2 |
| | at the fore ſhaft bar | 5 |
| | before | 3 |
| The thickneſs before | | 3.2 |
| Opening | at the ſhaft bolt | 15 |
| | at the fore ſhaft-bar | 21 |
| | in the middle | 30.5 |
| | before | 24 |
| The breadth of each ſhaft-bar | | 3 |
| The thickneſs of do. | | 2 |
| The length of the tongue | | 17 |
| The breadth of do. | | 3.6 |
| The thickneſs of do. | | 3 |
| The length of the guide-bar | | 50 |
| The breadth of do. in the middle | | 3 |
| The breadth of do. at the end | | 1.5 |
| The thickneſs | | 1.5 |
| The diſtance from the centre of one axle-tree to that of the other | | 89 |
| The ſommers reach | beyond the fore axle-tree | 10 |
| | beyond the hind | 38 |

The iron-work of ſuch a waggon.

| | No. |
|---|---|
| Pintle | 1 |
| Pole-pin | 1 |
| Bolſter-pins with keys | 4 |
| Locking-plates | 2 |
| Bail ſtaples | 16 |
| Sweep-bar pins | 2 |
| Shaft-bolt with key | 1 |
| Swing-tree pins | 2 |
| Hooks for do. | 2 |
| Bars for fixing the ſwing-tree to the axle-tree | 2 |
| Plate for the croſs-bar of the fore-guide | 1 |
| Waſhing-plates for the ſhafts | 2 |
| Bolſter bands | 4 |
| Pole plate | 1 |

With irons complete for the ſhafts, axle-trees, and the wheels, the dowledges excepted.

*Powder carts*, or *carriages*, are for carrying powder along with the army. Each of them is divided into four parts, by boards of an inch thick, which enter about an inch into the ſhafts. Only four barrels of powder are ſtowed in one of theſe carts. The roof of ſuch a cart is covered with oil-cloth, to prevent dampneſs from getting to the powder, and its dimenſions are the following: ſee *figs.* 53 and 54.

| | | Inches. |
|---|---|---|
| The diameter of each wheel | | 65 |
| The total length of each ſide with its ſhaft | | 180 |
| Diſtance from the hind end to the croſs-bar | | 5.5 |
| Diſtance from the hind croſs-bar to the fore croſs-bar | | 88.5 |
| Diſtance from the fore croſs-bar to the fore-end | | 77.5 |
| Breadth | behind | 3.3 |
| | at the fore croſs-bar | 4.4 |
| | in the middle | 3.7 |
| | before | 2.8 |
| Height | behind | 3 |
| | at the fore croſs-bar | 4 |
| | before | 2.8 |
| The opening behind and at the fore croſs-bar | | 34 |
| The opening at the middle | | 35 |
| The opening before | | 25 |
| Two ſhaft croſs-bars | Length of each | 34 |
| | Breadth | 2 |
| | Height | 3 |
| Under croſs-bars | Length of each | 40 |
| | Breadth | 3 |
| | Height | 2 |
| The length of each ſide piece | | 100 |
| The breadth of do. | | 13 |
| The height of do. | | 3 |
| Diſtance from the bottom, where the axle-tree paſſes through the ſide-pieces | | 3 |
| Diſtance from the ſhafts to the beginning of the roof | | 6 |
| The height of the roof | | 12 |
| The length of the lids or ſides | | 88 |
| The breadth of do. | | 10 |

| | Inches. |
|---|---|
| The thickneſs of do. | 1 |
| The length of the roof-ſides or lids | 88 |
| The breadth of do. | 11 |
| The thickneſs of do. | 1 |

| And the iron work is the following: | No. |
|---|---|
| *a*. Side bolts with ſcrews | 8 |
| *b*. Croſs bolts with ſingle keys | 2 |
| *c*. Double hinges for the ſhort lids | 6 |
| *d*. Staples and keys with chains | 4 |
| *e*. Hinges for roof-lids | 2 |
| *f*. Haſps, ſtaples, and keys for do. | 3 |
| *g*. Axle-tree pins with keys | 2 |

With irons complete for ſhafts, wheels and axle-tree.

A *ſling waggon* is an artillery carriage for moving mortars and heavy guns, from one place to another, at no great diſtance.

The following are the dimenſions of one: ſee *fig*. 55, 56, 57, and 58.

| | | Inches. |
|---|---|---|
| Side-pieces | Length | 152 |
| | Breadth | 6 |
| | Height | 7.8 |
| | Opening | 32 |
| | Exceed axle-tree | 10 |
| Interval between the centres of the axle-trees | | 123 |
| The height of each fore-wheel | | 48 |
| The length of its nave | | 14 |
| The diameter of the body of do. | | 13 |
| Do. of the middle of do. | | 14 |
| Do of the linch of do. | | 11 |
| The breadth of each of its felloes | | 3.8 |
| The height of do. | | 5.5 |
| The breadth of each of its ſpokes | | 2.2 |
| The thickneſs of do. | | 3.5 |
| The height of the hind-wheel | | 68 |
| The length of its nave | | 17 |
| The diameter of the body of do. | | 16 |
| Do. of the middle of do. | | 17 |
| Do. of the linch of do. | | 13 |
| The breadth of each of its felloes | | 4.4 |
| The height of do. | | 6 |
| The breadth of each of its ſpokes | | 2.3 |
| The thickneſs of do. | | 4 |
| The length of the fore axle-tree | | 75.5 |
| The length of the body of do. | | 41.5 |
| The breadth of the body of do. | | 5 |
| The height of the body of do. | | 8 |
| The length of each arm of do. | | 17 |
| The diameter of the body of each arm | | 5 |
| Do. of the linch of do. | | 3 |
| The length of the hind axle-tree | | 81 |
| The length of the body of do. | | 41 |
| The breadth of do. of do. | | 5 |
| The height of do. of do. | | 7 |
| The length of each of its arms | | 20 |
| The diameter of the body of each | | 5 |
| The diameter of the linch of each | | 4 |
| The length of the fore bolſter | | 41.5 |
| The breadth of do. | | 5 |
| The height of do. | | 12 |
| The length of the hind bolſter | | 51 |
| The breadth of do. | | 5 |
| The height of do. | | 11 |
| The length of the rider | | 54 |
| The breadth of do. | | 5 |
| The height of do. | | 7.2 |
| Of checks to ſupport the rack-work | the length below | 60 |
| | the length above | 22 |
| | the height | 20 |
| | the breadth | 6 |
| The length of each ſhaft | | 94 |
| Breadth | behind | 5.5 |
| | in the middle | 4 |
| | before | 3 |
| Opening | behind | 23 |
| | middle | 34 |
| | before | 25 |
| Thickneſs of the ſhafts | | 3 |

| And the iron-work of it is as follows: | No. |
|---|---|
| Cap-ſquares | 2 |
| Eye-bolts | 4 |
| Trunnion plates | 2 |
| Beam hooks | 2 |
| Iron to faſten the tooth-wheel | 1 |
| Rack-work with pland and handle | |
| Iron bar to ſtop the jack | 1 |
| Bolts with ſcrews to faſten the checks to the ſide-pieces | 8 |
| Hind axle-tree ſtays with bolts | 2 |
| Croſs-bar to faſten the ſide-pieces together | 1 |
| Hooks faſtened to the ſide-pieces with bolts and bars | 4 |
| Bolſter bolts with rings and keys | 4 |
| Pintle with band and waſher | 1 |
| Bolſter-hoops | 4 |
| Iron-work complete for ſhafts and wheels | |

And the following are the dimenſions of a *ſling cart*: ſee *figs*. 59 and 60.

| | | Inches. |
|---|---|---|
| The height of each wheel | | 60 |
| The length of its nave | | 15.5 |
| The diameter of the body of do. | | 14 |
| The diameter of the middle of do. | | 16 |
| The diameter of the linch of do. | | 12 |
| The breadth of each of its felloes | | 3.4 |
| The height of each of do | | 5.5 |
| The breadth of each of its ſpokes | | 2 |
| The thickneſs of each of do. | | 3 |
| The length of the axle-tree | | 77.5 |
| The length of its body | | 40.5 |
| The breadth of do. | | 5 |
| The height of do. | | 5.5 |
| The length of each of its arms | | 18.5 |
| The diameter of the body of each | | 5 |
| Do. of the linch of each | | 4 |
| The total length of each ſhaft | | 168 |
| From the centre of the axle-tree to the fore end | | 144 |
| Breadth of each from the hind end to the croſs-bar | | 7 |
| Do. of do. in the middle | | 5.5 |
| Do. of do. at the fore end | | 3.4 |
| The height of each ſhaft | | 3.6 |
| The breadth of each croſs-bar | | 4 |
| The thickneſs of do. | | 2 |
| Checks to ſupport the roller | length below | 28 |
| | above | 7 |
| | height | 9 |
| | thickneſs | 4 |
| | interval | 32 |
| Diameter of the roller | | 7 |
| From the centre of the axle-tree to the hind end | | 24 |

| And its iron-work is the following: | No. |
|---|---|
| Croſs bars | 2 |

| | |
|---|---|
| Round-headed nails to faſten the croſs bars - | 4 |
| Bolts with ſcrews to faſten the cheeks - | 7 |
| Iron-work complete for ſhafts and wheels. | |

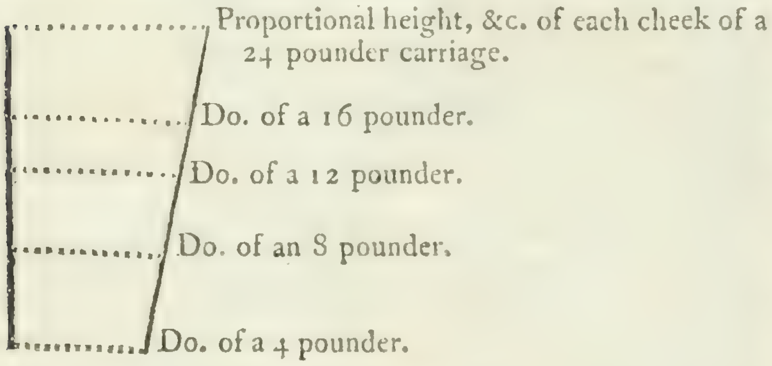
The French have been in the practice of uſing gun carriages on board their ſhips, or of having their *affuts de marins* with only two fore trucks, or roulettes pleines, to each, inſtead of ordinary wheels. Theſe carriages do not recoil ſo much as thoſe with four trucks, and are rather more eaſily pointed.

Their garriſon carriages uſed to be conſtructed a good deal in the ſame manner. But the trucks were made conſiderably larger than thoſe of their ſhip carriages, and conſiſted each of ſeveral pieces. They had alſo trails like travelling carriages, but much ſhorter.

Beſides theſe, they have travelling carriages, or *affuts a rouage*. Each of theſe conſiſts of two long cheeks of elm, rounded and ſhaped nearly as thoſe of one of our own travelling carriages, and like them are faſtened or joined together by means of four oak tranſoms, called by the French entretoiſes; the firſt of them, or breaſt tranſom, they call *entretoiſe de volée*; the ſecond, *entretoiſe de touche*; the third, *entretoiſe de mire*; and the fourth, which runs the whole length of the trail, or of thoſe parts of the cheeks that touch or reſt on the ground, *entretoiſe de lunette*. When ſuch a carriage with its gun is to be moved, a limber, or *avant train*, is faſtened to the trail of it.

*Fig.* 61. is an elevation in profile of one cheek of the travelling carriage called l'affut du capitaine Eſpagnol, repreſenting the relative dimenſions of the different parts.

The figure that follows repreſents the relative or proportional heights or depths of the heads of the cheeks of carriages for the five calibers of 24, 16, 12, 8, and 4 pounders, according to the French ordinance or regulation of 1732.



Carriage, in *Rural Economy*, in the practice of irrigation, a ſort of conduit made of timber or brick; if of the latter, an arch is turned over the ſtream that runs under it, and the ſides are bricked up; if of the former, which is commonly the caſe, it is conſtructed with a bottom and two ſides, as wide and as high as the *main* it lies in. It muſt be made very ſtrong, cloſe, and well jointed. Its uſe is to convey the water in one *main* over another, which runs at right angles with it; its depth and breadth are of the ſame dimenſions with the main it belongs to; its length in proportion to the breadth of the *main* it croſſes. Wherever it is neceſſary, it is the moſt expenſive conveyance belonging to the watering of land. See Irrigation, *and* Watering of Land.

Carriage *Drain*, a term applied to a furrow or trench, for the conveying of water to overflow and improve meadow land. Drains of this kind are diſtinguiſhed into two ſorts: the *main carriage*, which ſhould be made with a convenient deſcent; and the *leſſer carriage*, which ſhould be ſhallow, and as many in number as poſſible. Much in the watering of land depends upon their being properly laid out and formed.

Carriage alſo ſignifies the removal of goods, or other things from one place to another, eſpecially with a carr or cart.

Carriage alſo denotes the money or hire paid to a carrier, or other bearer of goods. See Carrier.

The carriage of letters is called *poſtage*. See Post.

Carriage *by ſea*, is denominated freight.

Carriage, *bill of*, *lettre du voiture*, among the French, denotes a paper given to a carrier, expreſſing the quantity and quality of the goods and parcels committed to him, partly to entitle him to receive his hire from the perſon to whom they are directed, and partly that this letter may ſhew whether all be brought, and whether in due time, and in the condition required.

Carriage is alſo uſed, in *Geography*, to denote the ſpace of ground, over which the inhabitants of New France, and other colonies of North America, who trade with the ſavages, uſually, by means of canoes, are obliged to carry their boats and proviſions, &c. on their ſhoulders. This they are forced to when they come to places in lakes or rivers, covered with willows, or otherwiſe rendered impracticable to paſs by water, till they meet with ſome new place, convenient for re-embarking.

CARRICK, or Carrig, the name of ſome towns, pariſhes, and headlands in Ireland, and the prefix to many more: it is ſuppoſed to ſignify a rock or ſtony place; and we accordingly find Carrick-fergus called alſo Knock-fergus and Cragfergus, all ſignifying the *rock of Fergus*.

Carrick, the name of a ſtrong fort on a rock near the town of Wexford, built by Fitzſtephens ſoon after his landing in Ireland, and afterwards enlarged and improved. Some time after, according to a note of Hooker's on Giraldus Cambrenſis, it was pulled down and deſtroyed, becauſe "it was not altogether ſufficient for a prince, and yet it was thought too good for a ſubject." The name is ſtill retained in the pariſh, and in a village called *Ferry Carrig*, where a wooden bridge was erected over the Slaney, by Samuel Cox, in 1795. It is two miles weſt from Wexford. Hollingſhed.

Carrick-*on-Shannon*, a poſt town of the county of Leitrim, Ireland, ſituated on the Shannon, and ſo called to diſtinguiſh it from the town mentioned in the following article. It was originally called *Carrick drum-ruſk*, but being planted by an Engliſh colony, and made a borough town, it acquired its preſent appellation. It is a ſmall place, not remarkable for any trade or manufacture; it is, however, the ſhire town of the county, and before the Union ſent two Members to Parliament. Its diſtance from Dublin is 77 miles N.W. N. lat. 53° 55'. W. long. 8° 1'.

Carrick-*on-Suire*, a market and poſt town of the county of Tipperary, Ireland, ſituated on the river Suire, between Clonmell and Waterford. The country in the neighbourhood is very beautiful, and the river being navigable for large ſloops gives it the benefit of a communication with Waterford by water. Formerly this was a walled town, and had a caſtle belonging to the Butler family, a branch of which takes the title of Earl from it. Before the bridge of Waterford was built, which is a late ſtructure, the bridge of Carrick was the neareſt paſſage to that city from Dublin, by land, which in times of diſturbance made it a very important paſs. For many years, however, it has been more remarkable for its woollen manufactures, eſpecially that of *ratteens*, which is carried on very extenſively. The town is irregularly built, but large and very populous; and the inhabitants are induſtrious. On the Waterford ſide of the river is the ſuburb of *Carrick-*

*Carrick-beg*, or *little* Carrick, which has ſome ruins, eſpecially of an old abbey. A ſteeple erected on one of the ſide walls of the church, is accounted a great curioſity, projecting about two feet over the wall, from which it takes its riſe in a point at twenty feet from the ground.

This town is mentioned by the abridger of Camden, in 1701, and called Carrick-mac-Griffin, but it is only of late years it has attained its preſent conſequence. Its diſtance from Dublin is 75 Iriſh miles S. by W. N. lat. 52° 20′. W. long. 7° 26′. Beaufort. Smith, &c.

CARRICKAMACHIN *Iſles*, a cluſter of ſmall iſlands and rocks off the coaſt of the county of Galway, Ireland, a few miles north of the Iſles of Arran. N. lat. 53° 13′. W. long. 9° 48′. M'Kenzie. Beaufort.

CARRICKAREDE. See Ballintoy.

CARRICKFERGUS, Cragfergus, or Knockfergus, *i.e.* the *rock of Fergus*, a market and poſt town of the county of Antrim, Ireland, on the northern ſhore of Carrickfergus Bay, or, as it is now uſually called, Belfaſt Lough. It was an early ſettlement of the Engliſh, and was deemed a place of great importance. In 1232, Hugh de Lacy, Earl of Ulſter, founded a monaſtery there, in the precincts of which he was buried a few years after. In the 14th century, when Edward Bruce invaded Ireland, his brother King Robert landed near Carrickfergus, and beſieged the caſtle; which held out ſo long that the garriſon were reduced to the neceſſity of eating leather, and ſurrendered only through want of food. In the reign of Henry the Seventh, this caſtle was one of thoſe which an act of Parliament declared ought to be only entruſted to Engliſhmen. It was not, however, 'till the government of ſir H. Sydney, in the reign of queen Elizabeth, that the adjoining town, the trade of which had become conſiderable, was ſurrounded with walls, and it was then made a corporation and endowed with many privileges. On the diviſion into counties, a large diſtrict was allotted to it, and it ſtill has a ſeparate juriſdiction. The mayor was alſo made admiral of the coaſt of Antrim and Down, and certain duties were paid to the corporation of Carrickfergus by veſſels going to any of the little neighbouring ports, excepting Bangor and Belfaſt. This privilege was purchaſed in the adminiſtration of lord Strafford, and the cuſtom-houſe transferred to Belfaſt. See Belfast. Lord Chicheſter, anceſtor of the preſent marquis of Donegal, having purchaſed the grant of the monaſteries at Carrickfergus about the year 1610, built a caſtle which was eſteemed ſplendid in thoſe days; but his attention ſeems to have been chiefly directed to the improvement of Belfaſt. Carrickfergus, however, continued a place of ſtrength, and as ſuch was taken poſſeſſion of by general Monk, on behalf of the Parliament of England. In the year 1690, it was the landing place of king William; but though it continues to have a governor regularly appointed, its fortifications have been ſuffered to decay. In 1759, Thurot, an adventurer, who commanded a ſmall French ſquadron, ventured to land here, and took hoſtages for the ranſom of the town, but he was ſoon obliged to retire, and his ſhips were taken or deſtroyed by the Engliſh. Carrickfergus is the aſſize town of the county of Antrim, and ſends one repreſentative to the Imperial Parliament. It is diſtant 88 Iriſh miles N. from Dublin, and 8 N. E. from Belfaſt. N. lat. 54° 43′. W. long. 5° 42′.

CARRICKHOULT, a bay or anchorage on the county of Clare ſide of the river Shannon, Ireland, near its mouth. This bay has clear ground, and good anchorage between Carrickhoult caſtle and Kilcadraan points. N. lat. 52° 33′. W. long. 9° 36′. Mackenzie.

CARRICKMACROSS, a market and poſt town of the county of Monaghan, Ireland, near the boundary of the county of Louth. From its being mentioned by Stanihurſt, it muſt be a place of antiquity, but does not appear to have been of much conſequence. It is now an improving town and a vein of good coal diſcovered near it will probably contribute to the eſtabliſhment of ſome manufacture, eſpecially as there is plenty of water, and a poſſibility of obtaining water carriage to Dundalk at no great expence. It is 44 Iriſh miles N. by W. from Dublin. N. lat. 53° 57′. W. long. 6° 43′.

CARRIER, a perſon who undertakes to convey perſons, goods, papers, money, or the like, from place to place, on condition of a certain price, either fixed by authority or cuſtom, or left to private agreement. See Carriage.

In Holland *carriers* are called *routiers*, becauſe they always keep the ſame road, or route; ſetting out, and arriving at fixed hours.

All perſons carrying goods for hire, as maſters and owners of ſhips, lightermen, ſtage-coachmen, (but not hackney-coachmen in London) and ſuch like, are legally comprehended under the denomination of common carriers, and are chargeable on the general cuſtom of the realm for their faults or miſcarriages. See Bailment. In an action on the caſe againſt the maſter of a ſtage-coach, it was adjudged that he was not chargeable (e. g. for a trunk loſt) unleſs the maſter takes a price for the carriage of the goods as well as for the carriage of the perſon, in which caſe he is within the cuſtom as a carrier; but by the cuſtom and uſage of ſtages, every paſſenger pays for the carriage of goods above a certain weight; and then the coachman ſhall be charged for the loſs of goods beyond ſuch weight. If a common carrier loſes goods which he is entruſted to carry, a ſpecial action in the caſe lies againſt him, on the cuſtom of the realm; and ſo of a common carrier by boat. 1 Rol. Abr. 6. An action will lie againſt a porter, carrier, or bargeman, upon his bare receipt of the goods, if they are loſt by negligence. 1 Sid. 36. Alſo, if a lighterman ſpoils goods which he is to carry, by letting water come to them, an action on the caſe lies againſt him on the common cuſtom. Palm. 528. If a carrier entruſted with goods opens the pack, and takes away any part of its contents, he is guilty of felony. H. P. c. 61. And it is the ſame alſo if a carrier receives goods to carry them to a certain place, and carries them to ſome other place, with intent to defraud the owner. 3 Inſt. 607. If a common carrier, having convenience and being offered his hire, refuſes to carry goods, he is liable to an action. 2 Show. Rep. 327. But he may refuſe to admit goods into his warehouſe at an unſeaſonable time, or before he is ready to take his journey. Lord Raym. 652. A common carrier may have action of trover or treſpaſs for goods taken out of his poſſeſſion by a ſtranger; and where goods are ſtolen from a carrier, he may bring an indictment againſt the felon as for his own goods; and the owner may likewiſe prefer an indictment againſt the felon. Kel. 39. By ſtat. 3 Car. 1. c. 1. carriers are not to travel on the Lord's day on pain of 20s. By 3 W. and M. c. 12. the juſtices are annually to aſſeſs the price of land carriage of goods that are to be brought into any place within their juriſdiction by any common carrier, who is not to take more, under the penalty of 5l. And by 21 Geo. II. c. 28. §. 3. a carrier is not to take more for carrying goods from any place to London than the juſtices have ſettled for the carrying of goods from London to ſuch a place, under the ſame penalty. This act of 21 Geo. II. c. 28. ſtands repealed by 7 Geo. III. c. 40. ſo much of it excepted as relates to the price or rate for carriage of goods; and the 7 Geo. III. c. 40. (except ſo much as repeals the ſeveral acts within-mentioned) was repealed by 13 Geo. III. c. 78. §. 83. By 24th Geo. II. c. 8. §. 9. commiſſioners for regulating the navigation of the river Thames are to rate the price of water-carriage; and by 30 Geo. II. c. 22. §. 3. juſtices of the city of London are to aſſeſs the rates of carrying goods between London and Weſtminſter. By 13 Geo. III. c. 78. carriers and waggoners are to write or paint on their waggons or carts their names and places of abode; and the owner of every common ſtage, waggon, or cart, travelling from town to town, ſhall paint "common ſtage waggon or cart," as the caſe may be, under the pain of forfeiting not more than 5l. nor leſs than 20s.

At common law a carrier is liable by the cuſtom of the realm to make good all loſſes of goods entruſted to him to carry; except ſuch loſſes as ariſe from the act of God, or inevitable accident; from the act of the king's enemies; and from the default of the party ſending them. 1 Inſt. 89. 2 Lord Raym. 909. Eſp. N. P 619. But, in order to charge the carrier, the following circumſtances are to be obſerved, 1. The goods muſt be loſt while in the poſſeſſion of the carrier himſelf, or in his ſole care. 2. The carrier is liable only ſo far as he is paid, for he is chargeable by reaſon of his reward. 3. Under a ſpecial or qualified acceptance the carrier is bound no further than he undertakes; and, therefore, it ſeems ſafeſt, that in all inſtances of ſending things of value by a carrier, the carrier ſhould have notice and be paid accordingly. 4. A delivery to the carrier's ſervant is a delivery to himſelf, and ſhall charge him; but they muſt be goods, ſuch as it is his cuſtom to carry, not out of his line of buſineſs, Salk. 282. 5. Where goods are loſt, which have been ſent on board a ſhip, the action may be brought either againſt the maſter or againſt the owner. 2 Salk. 440. 6. It is not neceſſary in order to charge the carrier that the goods are loſt in *tranſitu*, while immediately under his care; for he is *bound to deliver them* to the conſignee, or ſend notice to him according to the direction; and though they are carried ſafely to the inn, yet if left there till they are ſpoiled, and no notice given to the conſignee, the carrier is liable. *3* Wilſ. 429. 2 Bl. Rep. 916. Jacob's Dict. by Tomlins.

Carrier *pigeon*, a ſort of pigeon uſed, when properly trained up, to be ſent with letters from one place to another. This is the Columba *Tabellaria* of the Linnean ſyſtem.

It is larger in ſize than moſt of the other kinds. Its length from the tip of the beak to the end of the tail being often fifteen inches; but its greateſt weight not twenty ounces. Its fleſh is firm and its feathers cloſe; it is long-necked, and of a better ſhape than moſt other pigeons. The upper chap of the bill is half covered from the head with a white or blackiſh tuberous furfuraceous fleſh, which projects or hangs over both its ſides, on the upper part neareſt the head, and ends in a point about the middle of the bill. This is called the *wattle*. The eyes are ſurrounded with the ſame ſort of corrugated fleſh for the breadth of a ſhilling, and their iris is red. Their beak is long, ſtraight, and thick; their wattle generally broad acroſs the beak, ſhort from the head toward the point, and tilting forward from the head; and the head narrow, long, and flat; the neck very long and thin, and the breaſt broad; the feather is chiefly black or dun, though there are blues, whites, and pyed.

It has its name from its remarkable ſagacity in returning to the place where it was bred, though carried to great diſtances; from which property it was made uſe of to carry letters to diſtant places, as a ſpeedy and ſafe method of conveyance.

They were trained to this method in Turkey and Perſia, and were carried firſt, while young, ſhort ſlights of half a mile, and afterwards more, till at length they would return from the fartheſt part of the kingdom. Every baſhaw had a baſket of theſe pigeons, bred at the ſeraglio, which, upon any emergent occaſions, as an inſurrection, or the like, he diſpatched with letters, braced under their wings, to the ſeraglio, only ſending out more than one, for fear of accidents. Lightow aſſures us, that one of theſe birds would carry a letter from Babylon to Aleppo, which is thirty days journey, in forty-eight hours. This pigeon was employed, in former times, by the Engliſh factory, to convey intelligence from Scanderoon, of the arrival of the Company's ſhips in that port, the name of the ſhip, the hour of her arrival, and whatever elſe could be comprifed in a ſmall compaſs, being written on a ſlip of paper, which was ſecured in ſuch a manner under the pigeon's wing as not to impede its flight; and her feet were bathed in vinegar, with a view to keep them cool, and prevent her being tempted by the ſight of water to alight, by which the journey might have been prolonged, or the billet loſt. The pigeons performed this journey in 2½ hours. The meſſenger had a young brood at Aleppo, and was ſent down in an uncovered cage to Scanderoon, from whence, as ſoon as ſet at liberty, ſhe returned with all poſſible expedition to her neſt. At the ſeaſon of the arrival of the annual ſhips, it was uſual to ſend pigeons to be ready at the port. Some have aſſerted that the pigeon was at once ſent down to Scanderoon in a cage; but others with greater probability affirm, that ſhe was taught by degrees to fly from ſhorter diſtances on the Scanderoon road. It is alſo ſaid, that the pigeons, when let fly from Scanderoon, inſtead of bending their courſe towards the high mountains ſurrounding the plain, mounted at once directly up, ſoaring ſtill almoſt perpendicularly till out of ſight, as if to ſurmount at once the obſtacles intercepting their view of the place of their deſtination.

The cuſtom of carrying on a correſpondence between Aleppo and Scanderoon by means of pigeons was common in M. D'Arvieux's time. Mem. T. v. p. 496. Maillet, in his "Deſcription de l'Egypt," vol. ii. p. 271, has given a very circumſtantial account of this mode of conveying intelligence; and he alſo relates a ſtory of a pigeon diſpatched from Aleppo to Scanderoon, which, miſtaking its way, was abſent for three days, and in that time had made an excurſion to the iſland of Ceylon; a circumſtance then deduced from finding green cloves in the bird's ſtomach, and credited at Aleppo. Baumgarten mentions the flying of pigeons in his time (1504) in Egypt. Sir John Mandeville alſo mentions it in his Travels. In the time of the holy war, certain Saracen ambaſſadors who came to Godfrey of Antioch from a neighbouring prince, ſent intelligence to their maſter of the ſucceſs of their embaſſy, by means of pigeons, fixing the billet to the bird's tail. Bochart has collected numerous authorities for the antiquity of this cuſtom both in Syria and Greece, (vol. ii. p. 15,) and more reſpecting its antiquity may be found in Pennant's Britiſh Zoology. Hirtius and Brutus, at the ſiege of Modena, held a correſpondence with one another by means of pigeons. And Ovid tells us, that Tauroſthenes, by a pigeon ſtained with purple, gave notice to his father of his victory at the Olympic games, ſending it to him at Ægina. Ælian. Var. Hiſt. lib. ix. cap. 2. Pliny, lib. x. cap. 24. Anacreon tells us, that he conveyed a billet-doux to his beautiful Bathyllis, by a dove. Ode 9. The uſe of pigeons, as couriers between Aleppo and Scanderoon, and alſo Bagdad, has been diſcontinued for the laſt 40 or 50 years, becauſe the Curd robbers killed the pigeons. See Dragoon and Horseman.

CARRIERA, Rosalba, in *Biography*, an eminent female painter, was a native of Chiozza, in the Adriatic, where ſhe was born, in 1675; and being deſtitute of perſonal charms, ſhe gave ſcope to her mental abilities. Having manifeſted an early taſte for painting, her father procured for her the inſtruction of an artiſt, from whom ſhe learned to paint full ſize in oil; but afterwards ſucceeding in miniatures, ſhe confined herſelf to this branch of the art, and carried crayon painting to a high degree of perfection. Her portraits, ſpread all over Europe, are as elegant and graceful in conception and attitude, as they are freſh, neat, and alluring in colour. Her Madonna, and other religious ſubjects, blend dignity, and even majeſty, with grace. Her reputation was very widely extended; and whilſt ſhe exhibited ſpecimens of her ſingular ſkill in Italy, at Paris, and Vienna, ſhe received diſtinguiſhed marks of reſpect and eſteem. She lived with diſtinction in her native country, and her works were eagerly ſought by the curious in diſtant nations. Inceſſant application deprived her of ſight during the laſt ten years of her life. She combined muſic with painting; and at the advanced age of 82 years, cloſed her life, in 1757, after having amaſſed conſiderable property of her own acquiſition. D'Argenville. Pilkington, by Fuſeli.

CARRIERE. See Career.

CARRION, in *Geography*, a river of Spain, which joins the Piſuenga, near Duennas.

Carrion *di los Condes*, a town of Spain, ſeated on the river Carrion, in the province of Leon, on the frontiers of Old Caſtile; containing 10 pariſh churches, 10 convents, and 2 hoſpitals; 14 leagues W. of Burgos.

CARROBALISTA, in the *Ancient Military Art*, denotes a ſpecies of *baliſta*, mounted on wheels, and drawn by horſes; by which it differed from the *manubaliſta*, which, being leſſer and lighter, was thrown by the hand.

CARROCIUM, or Carrocerum, in *Middle Age Writers*, denotes the banner, or chief flag of an army, which was mounted on a kind of chariot, and drawn by oxen.

CARROCK, in *Geography*, a mountain of England, in the county of Cumberland, 2265 feet above the level of the ſea.

CARRODUNUM, in *Ancient Geography*, a town of Germany, according to Ptolemy, ſuppoſed to be the preſent Radom, in the palatinate of Sendamir.—Alſo, a town of Vindelicia, ſuppoſed to be the preſent Crainburg, on the Inn.—Alſo, a town of Upper Pannonia, which the interpreters of Ptolemy ſuppoſe to be the preſent Carnburg, on the banks of the Rab.—Alſo, a town of European Sarmatia, ſeated on the river Tyras. Ptolemy.

CARROG, a river of Wales, which runs into the ſea, about 4 miles S.W. from Caernarvon.

CARRON, a river of Scotland, which runs into the ſea, near Stonehaven, in the county of Kincardine.—Alſo, a ſmall river of Scotland, which riſes about the middle of the iſthmus between the friths of the Forth and Clyde, and, after a courſe of about 14 miles, dividing the county of Stirling into two nearly equal parts, falls into the Forth, three miles E. from the Carron works, in the county of Stirling. This river ſeems to have been the boundary of the Roman province in North Britain; Antoninus's wall being in the vicinity of this river, and running parallel to it for ſeveral miles. This opinion is rendered probable by the ſituation of "Arthur's Oven," as it is called, which is ſuppoſed to have been a temple dedicated to Terminus, and erected near the Roman frontier. It ſtood on the weſt ſide of the river Carron, or between that river and Kinnaird. The moſs of Kinnaird, which was without doubt formerly united to that of Froſk, is diſtant only one mile and a half from the river, and the moſs of Kincardine is only twelve miles diſtant from the ſtation at Camelon. Foreſts, therefore, in either of theſe places, would have afforded very convenient refuge to the Caledonians, whether they were making incurſions into the Roman province, or haraſſing the Roman armies in their expeditions towards the north. Beſides, that a people more civilized than the ancient Caledonians muſt have been in this country before the moſs of Kincardine exiſted, is completely eſtabliſhed by the diſcovery of a road on the ſurface of the clay at the bottom of that moſs, after the peat, to the depth of eight feet, had been removed. The direction of this road is from the Forth acroſs the moſs towards a road, ſuppoſed to be Roman, which paſſes between the moſs and the river Teith. Theſe roads probably communicated, and were parts of the military works of the Romans, and deſigned for the uſe of the troops employed to repel the incurſions made by the Caledonians from the mountains into the Roman province. A paſſage in Herodian favours the opinion here advanced. That hiſtorian (lib. iii. cap. 48.) mentions the army of Severus paſſing τα προβεβλημενα ῥευματα τε και χωματα της Ρωμαιων αρχης. He adds, that on this frontier the Barbarians uſually made their eſcape, "and concealed themſelves in the thickets and marſhes." Edinb. Tranſ. vol. iii. p. 276. Near the middle of the courſe of this river, in a pleaſant valley, ſtand two beautiful mounts, called the "hills of Dunipace," which are now planted with firs, and between which is ſeated the church of Dunipace. Tradition reports, that theſe mounts were raiſed as monuments of a peace concluded in that place between the Romans and Caledonians, and that their name is compounded of the language of both people; *dun*, ſignifying a hill in the old language of this iſland, and *pax*, peace, in the language of Rome: ſo that Dunipace denotes "the hills of peace." Others, however, have ſuppoſed that they are ſepulchral monuments, which is an opinion, not improbable. See Barrow. As this river runs ſo near the boundary of the Roman province, if it be not itſelf the preciſe boundary, the adjacent country muſt unavoidably be the ſcene of many rencounters and battles. Accordingly, hiſtorians mention a bloody battle fought near this river between the Romans and the confederate army of the Scots and Picts in the beginning of the 5th century; and the tranſlator, or the author, of Oſſian's poems lays the ſcenes of ſome of them upon the banks of this river. About the diſtance of half a mile from the river, and near the town of Falkirk, lies the field of that battle which was fought by William Wallace and the Engliſh, in the beginning of the 14th century. It bears the name of "Graham's Muir," from the valiant John Graham, who fell there, and whoſe grave-ſtone is ſtill to be ſeen in the church-yard of Falkirk.

Carron, a village of Scotland, in the county of Stirling, ſeated on a river of the ſame name; celebrated for its extenſive iron forges; two miles N. of Falkirk, and three miles above the entrance of the Carron into the frith of Forth. The river is navigable for ſome miles from its mouth, and a conſiderable trade is carried on upon it by ſmall craft; for the convenience of which its channel has of late years been ſtraightened and much ſhortened, and the great canal is connected with it by a cut and lock. See *Forth and Clyde* Canal. The Carron ore is deſcribed by Mr. Kirwan, (Miner. vol. ii. p. 174.) as being an argillaceous ſtone, of a bluiſh grey, internally of a dark ochre yellow. It is found in ſlaty maſſes, and in nodules, in an adjacent coal-mine, of which it ſometimes forms the roof. At the Carron-works, this ore is often ſmelted with the red greaſy iron ore from Ulverſton, in Lancaſhire, which imparts eaſier fuſion, and ſuperior value. Theſe works, which have attained ſuch diſtinguiſhed celebrity, were firſt eſtabliſhed principally under the direction of Dr. Roebuck, an ingenious chemiſt and phyſician of Birmingham, and by means of a capital furniſhed by his relations and friends, as well as thoſe of his aſſociate Mr. Garbet, in addition to their own. After a careful and minute compariſon of the advantages and diſadvantages of different ſituations in Scotland, he made choice of a ſpot, on the banks of the river Carron, as the moſt advantageous ſituation for the eſtabliſhment of the propoſed iron manufacture. There he found they could eaſily command abundance of water for the neceſſary machinery; and in the neighbourhood of it, as well as every where along both the north and ſouth coaſts of the Frith, were to be found inexhauſtible quarries of iron ſtone, lime-ſtone, and coal. From Carron alſo, they could eaſily tranſport their manufactures to different countries by ſea. The communication with Glaſgow, at that time, by land-carriage, which opened to them a ready way to the American market, was ſhort and eaſy. To aid him in the execution of his undertaking, he engaged the co-operation of Mr. Smeaton, then the firſt engineer in England, and alſo of Mr. James Watt, then of Glaſgow, but ſince better known for his inventive genius in the mechanic arts, both in Scotland and England. The neceſſary preparations for the eſtabliſhment of the iron-works at Carron were finiſhed towards the cloſe of the year 1759; and on the firſt of January, 1760, the firſt furnace was blown; and in a ſhort time afterwards a ſecond was erected. See the article Roebuck. For the extenſion and improvement of this foundery, about 100 acres of land have been converted into reſervoirs and pools, for water diverted from the river Carron, by magnificent dams built about two miles above the works, which, after turning 18 large wheels for the ſeveral purpoſes of the manufacture, falls into a tide-navigation that conveys its produce to the ſea. For a further account of the machinery of theſe works, the number of its furnaces, the annual amount of iron ſmelted, &c. &c. ſee Blast *Furnace*. See alſo Cannon. The preſent proprietors of this foundery are a chartered company, with a capital of 150,000l. ſterling, a common hall, &c.; but their ſtock is confined to a few individuals.

CARRONADE, in the *Military Art*. See Cannon.

CARROOR, in *Geography*, a town and fort of Hindooſtan, in the country of Myſore, and province of Coimbetore, ſeated on the Ambravetty; evacuated by the troops of Tippoo Sultan, on the 15th of June, 1790, when general Meadows, commander of the Britiſh forces, took poſſeſſion of it, and made it a depôt for proviſions; 38 miles W. of Trichinopoly. N. lat. 10° 57′. E. long. 78° 12′.

CARROT, in *Botany*. See Daucus *carota*.

Carrot, in *Gardening*. See Daucus.

Carrot, in *Huſbandry*, is a large well-known tap-rooted plant, which, at preſent, is much employed in the feeding of different ſorts of live ſtock; in which view it is a root of conſiderable utility and importance to the farmer. It is, however, only within theſe few late years that its application in this intention has been carried to any extent in this country. It was probably firſt introduced into field culture in the ſouthern parts of the iſland from the Low Countries. There are ſeveral varieties of this valuable plant, but that which is the moſt proper for being cultivated in the field for the above uſe is that which is uſually termed the *orange carrot*, in which the colour of the root is of a much more dark orange appearance than in any of the others; and, beſides, it riſes to a much larger ſize, and is more ſaccharine and juicy. See Daucus.

This ſort of crop is capable of being cultivated probably to the greateſt advantage on the warm, light, loamy, or ſandy ſoils; but it ſucceeds well on other kinds, as on gravelly lands. Mr. Young properly remarks, that the proper ſort of ſoil "ſhould not be miſtaken through common notions, or confined to a compaſs much within the reality. It is, ſays he, a general idea, that nothing but ſands will do for carrots, but this is a miſtake, the beſt ſoil for them is a ſandy loam, rather light, but moiſt, of a great depth; in which there is little difficulty in ploughing to the very beam of the plough, all the ſoil brought up being of the ſame kind, and as fit for vegetation as the ſurface." But, though he conſiders this ſort of ſoil as the moſt perfectly adapted to this kind of crop, "it will, he conceives, thrive to great profit on the heavier loams, but not on wet ones, or clays. On good wheat loams of the gravelly kinds that plough eaſily they do well. At firſt ſight, he ſuppoſes, they might, perhaps, be thought too ſtiff; but they will yield large carrots, though the expences of cultivation will run higher in cleaning the ground, &c."

In the preparation of the land for this ſort of crop much tillage is by ſome conſidered unneceſſary: "the beſt culture of carrots is," ſays the above author, "to let the barley or wheat ſtubble lie till you plough and ſow, putting them in on one earth." But others are inclined to more tillage, and think that on whatever ſort of ſoil this root may be grown, or after whatever kind of crop, the ground ſhould conſtantly be ploughed as deep as poſſible in October, a ſecond time in dry weather in February, and a third in March, for the reception of the ſeeds. By ploughing the land deep in October, two beneficial purpoſes are, they ſuppoſe, anſwered; the new ſoil is expoſed to the influence of the winter's froſts, by which it is mellowed and rendered more fit for nouriſhing the plants; and the roots of the carrots are enabled, with more freedom, to puſh downwards, a circumſtance of conſiderable importance in this kind of huſbandry; for, if the roots meet with any obſtruction in getting down, they are apt to grow forked, and throw out lateral roots, by which the crop is injured in a very material degree. Mr. Young, however, only conceives the ſecond ploughing in February neceſſary, in caſes when the ſurface mould is not expected to be in a ſtate of ſufficient fineneſs at the period of ſowing. When the laſt ploughing or ſeed-furrow in March has been given, the land ſhould be harrowed, and the ſurface made as fine as poſſible for the ſeed to be put in upon.

Though it is not abſolutely neceſſary to make uſe of manure for this ſort of crop, as good carrots may be grown without it, it is plain, from the numerous trials which have been made and recorded in different works, that it is only by the liberal application of it, that the largeſt quantity of produce can be afforded. Where it is applied it ſhould be turned into the ground in a well-rotted ſtate during the laſt ploughing in March.

At this period the ſeed ſhould be ſown in an even manner over the ſurface, in the proportion of five pounds to an acre, and harrowed in immediately in a light way. Mr. Young, however, adviſes, that where the land is ſufficiently fine and mellow at the time of ploughing, in February, and proper for being harrowed upon, not to omit ſowing upon that ploughing, "for, although March is the common ſeaſon, the uncertainties of the weather are ſuch, that the ſtate of the land, in moſt caſes, requires a greater attention than the name of the month; and carrot ſeed, let the weather be ever ſo ſevere, will take no harm. It may, ſays he, be ſown without danger in November. In caſe March turns out very wet, and the ſowing is driven into April, it is twenty to one that the crop will ſuffer." About the 25th of March is, however, the time moſt generally obſerved in the Suffolk practice.

In regard to the ſeed, it has been recommended by the author of "Practical Agriculture," for cultivators to be careful in ſaving it, by ſelecting ſome of the beſt and moſt perfectly formed roots annually of the preceding year's growth, and ſetting them out ſeparately in the beginning or middle of March, in an open piece of ground for the purpoſe. The ſeed in this way will be ready in Auguſt; by which means the farmer will always be in poſſeſſion of ſuch good freſh ſeed as may be fully depended upon; which can ſeldom or ever be the caſe where it is purchaſed. As this ſort of ſeeds is liable to adhere or cling cloſe together, it is almoſt impoſſible to ſow them with any degree of regularity or exactneſs, without adopting ſome method of ſeparating them, before they are made uſe of in the way of ſeed. With this intention the beſt mode is probably that of mixing them with ſome ſort of material that may render them more capable of being diſperſed over the land, ſuch as ſaw-duſt, bran, or a light kind of dry ſand, uniting the whole well by rubbing them together. By this means the ſeeds may be ſo diſengaged and ſeparated from each other, as to enable the ſeedſman to ſcatter them with much more evenneſs over the ſurface of the ground. There is alſo another improvement in the culture of this crop, with reſpect to the ſeed, which is that of ſteeping it from one to two days in water, by which, it is ſaid, the vegetation of it is greatly forwarded, which is a circumſtance of much conſequence to the crop.

Though we have ſeen that five pounds of ſeed are made uſe of to the acre in the broad-caſt method; where the drill plan is followed, two or three pounds may be fully ſufficient. The firſt of the above modes of ſowing is, however, the moſt commonly practiſed, the ſeed being afterwards lightly harrowed in by a ſmall harrow; and, as it is not much ſuited for being diſperſed or delivered with exactneſs by the drill-machine, and the young plants eaſily ſet out to proper diſtances by the hoe, it is probably the moſt ſuitable method of putting in the crop.

The drill plan has, notwithſtanding, been attempted in order to leſſen the expence of hand labour in hoeing the crops by ſome farmers. In theſe caſes, the ſeed is put in in equidiſtant rows, at twelve, fifteen, or eighteen inches diſtance from each other, according to the land and the mode of hoeing that is employed. In ſome inſtances drill-machines are not made uſe of, but the land is ſtricken into ſmall drills or furrows by hoes or other implements for the purpoſe, and then the ſeed caſt over the ground by the hand, and harrowed in lightly, or covered, by hoeing in the tops of the ridgelets, in a light even manner. When a drill machine is employed for this purpoſe, it is recommended by Mr. Amos to put the ſeed in to the depth of one inch in the rows, leaving the ſpace of fourteen inches between them as an interval. The ſeed is prepared by previous ſteeping and mixing in the manner mentioned above, and the land afterwards harrowed over once in a place, in a light manner.

It is of great conſequence that this ſort of crop ſhould be properly thinned out while the plants are in their early growth, and kept perfectly free from all ſorts of weeds by repeated hoeings. In the firſt of theſe, which ſhould be given as ſoon as the plants can be fully diſtinguiſhed from the weeds that are about them, the work ſhould be performed with three inch hoes, having handles not more than two feet in length, and be executed with great care and attention, as it is often extremely difficult to diſtinguiſh the young carrot plants from the weeds. The ſecond hoeing ſhould be given in a few weeks afterwards, according to the ſtate of the crop, which may be performed with common hoes, and the plants be ſet out to proper diſtances. From eight to fifteen or eighteen inches each way are the moſt uſual diſtances at which they are ſuffered to ſtand; and it has been found, from the experience of many years, in diſtricts where they are the moſt cultivated, that carrots, which grow at ſuch diſtances, conſtantly prove a more abundant crop than when the plants are permitted to ſtand cloſer together. The third hoeing is moſtly given about the middle or towards the end of June, and in this, beſides deſtroying the weeds, another material circumſtance to be attended to is, to ſet out the carrots at proper diſtances, and alſo whenever any have been left double at the former hoeings, to take the worſt of the two plants away, ſo as to leave the reſt perfectly clear and free from interruption. When the crop has been put in earlier than the uſual period, the firſt hoeing ſhould, Mr. Young ſays, be performed in the latter end of April, and when the weather is fine, as much injury may be done in executing it when there is much wet. And where the firſt hoeing has been given at the above time, the crops ſhould, in the beginning of May, be well harrowed, and have a ſecond hoeing towards the end of it. The harrowing will not, he aſſerts, "damage the young carrots, nor pull up one in twenty; but it will diſplace the weeds ſet again by rain, and check the growth of thoſe that are got up ſince." The crops ſhould likewiſe be looked over towards the latter end of Auguſt, and ſuch ſtraggling weeds as may be met with removed. This is more neceſſary than farmers in general ſuppoſe.

The expence of theſe different hoeings differs conſiderably in different ſituations, but is generally from 10s. to 18s. the acre, and in ſome places rather more.

There are differences in the carrot huſbandry in different diſtricts. In Suffolk, the farmers ſow them after turnips, ſummer-land-barley, and peaſe ſet upon a rye graſs lay; the crops upon the firſt are generally moſt productive; next to that they prefer the latter. In the firſt caſe they feed off the turnips by the beginning of February, and then lay the land up in ſmall balks or furrows, in which ſtate it remains till the ſecond week in March, when it is harrowed down, and double-furrowed to the depth of about twelve inches, and the ſeed ſown thereon, at the rate of four pounds and a half to the acre. As ſoon as the plants appear diſtinctly, they are ſet out with a ſmall hoe at the diſtance of ſix inches from each other, they are afterwards hoed twice more at different times, according as the crop ſeems to require it; and it is not unuſual to harrow them between the hoeings, which does no injury to the root, and frequently ſaves the expence of the third hoeing. When carrots are intended to be ſown after peaſe, they uſually plough the ſtubble as ſoon as the harveſt is over, in order that the land may clear itſelf of weeds; in December, it is laid up in ſmall balks to receive the benefit of the froſts; in February, it is harrowed down and manured at the rate of fifteen loads per acre; the manure is ploughed in to the depth of about four inches, and in the month of March the land is double-furrowed and the ſeed ſown. By purſuing this method they ſay the manure lies in the centre of the ſoil, and not only affords nouriſhment and ſupport to the carrot in its perpendicular progreſs, but renders it eaſy to be turned up by a ſingle ploughing, and greatly promotes the growth of the ſucceeding crop of barley. But in Norfolk, where it is the practice alſo to ſow carrots after a crop of turnips, the manure, after being put on the land in the beginning of March, is firſt ploughed in with a common plough, and afterwards the land is trench-ploughed about fourteen or fifteen inches deep, it is then harrowed very fine, and the ſeed ſown about the middle of March, though the latter end of that month is probably better, as then plants come up early as ſoon as the early ſown, and are attended with fewer weeds. The carrots are in this way generally ready to hoe in the beginning of May, and when tolerably free from weeds, may be hoed with large hoes. Carrots are alſo frequently grown with the ſame preparations on the ſame land where potatoes have grown. The manner in which Mr. Billing cultivated his land for theſe plants, is the following: The wheat and clover ſtubbles were ſplit down by him with the plough the preceding November, and he is ſatisfied, that whether the wheat ſtubble, be, as it is called in Norfolk, flat work, or in ridges, or the carrots are to be ſown after clover or rye graſs, the land cannot be ploughed too early, ſo that the froſt and ſnow may have their full effect in mellowing the ground for the reception of ſo ſmall a ſeed; and this is the more neceſſary to be attended to, the ſtiffer and tougher the ſoil is. He ploughs the wheat and clover ſtubble three times, but the land on which the turnips have been, but twice; the firſt time ſhallow, but the laſt as deep as the ſtaple of the ground will permit, and on this ploughing the carrots are ſown. Sometimes the land is immediately dunged for the carrots, but at other times only for the previous crop: the former is probably the better method. Mr. Billing thinks four pounds of ſeed an acre is fully ſufficient. It is generally three weeks after ſowing, and ſometimes longer before the carrots appear, and they are frequently ſeven or eight weeks before they are fit for the hoe, which affords the weeds an opportunity to get ſtrength in this ſeaſon, as they grow faſt. Mr. Billing is therefore of opinion, that it is better to ſow them as late as you can with ſafety to the crop, as he found thoſe ſown in April on clover-ſtubble, came much the ſooneſt to the hoe, though later ſown. In this mode where the crop of carrots is very clean, one hoeing may, he thinks, be ſufficient; but, where the weeds are ſtrong, it is neceſſary to hoe them a ſecond time; but about ten days or a fortnight after the firſt hoeing, they ſhould be harrowed: this will diſplace the weeds, and prevent their growing again, which many of them will probably otherwiſe do, eſpecially if it be ſhowery weather. The harrowing does not hurt the carrot plants, as has been obſerved above, but, on the contrary, does them ſervice, by bringing freſh earth to them, as well as by deſtroying the weeds. In about three weeks after harrowing where the ground is not cleared, or in caſe new weeds ſpring up, Mr. Billing hoes the carrots a ſecond time; and after this, if there ſtill remain any weeds, which will be the caſe if much rain falls during the time of the ſecond hoeing, a third harrowing is beſtowed. But where the weather has been favourable, and thoſe employed in hoeing have done their duty, the carrots once hoed and harrowed have been, he ſays, as clean as thoſe on which two hoeings and as many harrowings have been practiſed.

It is the remark of an Eſſex farmer, that carrots will amply repay every expence of the fineſt culture, and ſhould from their extenſive utility, on ſound, deep, and friable land, be every where attempted. He ſows in March or April; hoes three times, and harrows after each hoeing.

The expence of cultivating this crop on poor ſandy land of five ſhillings an acre in the Suffolk method, is thus ſtated.

| *Expences.* | *£.* | *s.* | *d.* |
|---|---|---|---|
| One deep ploughing, | 0 | 7 | 0 |
| Seed and ſowing, | 0 | 4 | 6 |
| Hoeing, | 1 | 1 | 0 |
| Taking up 1s. a load of forty buſhels topped, that is on two hundred, | 0 | 5 | 0 |
| Carting home, | 0 | 5 | 0 |
| Rent, tythes, and rates, | 0 | 7 | 0 |
|  | £2 | 9 | 6 |

The charges at preſent ſtand conſiderably higher, even on ſoils of this ſort, as well as thoſe of the better kind.

In an experiment of the Rev. Mr. Young's, detailed in a late volume of the Annals of Agriculture, made on a good ſandy friable loam, ſufficiently dry for turnips being eaten off, on it; having a ſub-ſoil of the gravelly loam kind, the expences and produce were as below, on eight acres. The land was ploughed nine inches deep in the early part of March; and in the laſt week of it three pounds of ſeed per acre were harrowed in; but the work does not ſeem to have been performed with ſufficient accuracy.

| *Expences.* | *£.* | *s.* | *d.* |
|---|---|---|---|
| Ploughing at 8s. | 3 | 4 | 0 |
| Seed, 45 lbs. at 1s. 6d. | 3 | 7 | 6 |
| Sowing, | 1 | 6 | 0 |
| Harrowing, | 0 | 8 | 0 |
| Hoeing four acres at 25s. and four at 21s. | 9 | 9 | 9 |
| Ditto, ſecond time, eight acres at 10s. | 4 | 0 | 0 |
| Taking up and clearing 4360 buſhels, at 3s. per load of 40 buſhels, | 16 | 6 | 9 |
| Seventy-four days work of one horſe, at 2s. 6d. | 9 | 5 | 0 |
| A bailiff for attending the work, | 3 | 3 | 0 |
| Farm general expences, fines 1s. per acre, | 0 | 8 | 0 |
| Ditto, ſundries, 1s. per acre, | 0 | 8 | 0 |
| Rent, tithes, and rates, | 12 | 0 | 0 |
| 8l. per acre, | £63 | 6 | 0 |

| *Produce.* | *£.* | *s.* | *d.* |
|---|---|---|---|
| By 2933 buſhels, ſold at 7d. and 8d. | 92 | 7 | 2 |
| — horſes 160 buſhels uſed, to Dec. 20th, ſaved 7 coombs, 2 buſhels of oats, | 4 | 18 | 0 |
| — ſaddle horſe, 26 at 7d. | 0 | 15 | 2 |
| — 200 lambs 2 weeks at 2d. | 1 | 13 | 4 |
| — hogs 548 buſhels at 8d. | 6 | 17 | 0 |
| — 8 cattle on the tops 2 weeks | 0 | 16 | 0 |
| — horſes 72 buſhels at 7d. | 2 | 2 | 0 |
| — hogs to Dec. 29th, 60 buſhels, | 0 | 15 | 0 |
| — Ditto, 158, at 3d. | 1 | 19 | 6 |
| — horſes, 112 at 7d. | 3 | 5 | 4 |
| — hogs, 10½ at 8d. | 0 | 7 | 0 |
| — ſaddle horſe, 15 at 8d. | 0 | 10 | 0 |
| — hogs 8 at 8d. | 0 | 5 | 4 |
| — cow, 3 at 8d. | 0 | 2 | 0 |
| — 50 buſhels half rotten ſold for | 0 | 18 | 0 |
|  | £117 | 10 | 10 |
| Expences, | 63 | 6 | 0 |
| Profit, | £54 | 4 | 10 |

This is 6l. 15s. 7d. per acre profit, beſides the land being left in moſt excellent order for barley, which fully ſhews the vaſt advantage of cultivating this kind of crop wherever the farmer has land capable of admitting it.

Of the advantage of the drill culture there are different opinions, but further trials are neceſſary. Mr. Amos's method is "two pounds of ſeed per acre." He ſteeps the ſeed in rain water twenty-four hours, and lays it upon a floor, until ſpeared. Mixes it thoroughly, with three pecks of dry ſaw-duſt, and three pecks of fine dry mould. Drills one inch deep and fourteen inches between the rows, with the ſame cups uſed for wheat or barley. Harrows once in a place. The plants appear in eight or ten days. On expreſſing his ſurprize at ſeeing good long carrots grown on very ſhallow ſands, to a perſon who had been many years baliff to ſeveral eſtates, he told him that he had been accuſtomed to obtain carrots of full length and ſize, in ſuch land, by dibbling the ſeed to a great depth, with an iron dibbler; and when it was objected, that the plants, from the ſeed being ſo deeply buried, would never get above the ſurface; he aſſured him, in his numerous trials, he never obſerved any ſuch conſequence.

It is ſtated by a writer in the twenty-fourth volume of the Annals of Agriculture, that he ſowed broad-caſt two acres of carrots, following a potatoe crop, on a light ſandy loam of twenty ſhillings an acre. They were twice hoed, at thirteen ſhillings the two, in the manner of hoeing turnips; and in the courſe of the Summer he mowed one third of the tops twice; another third of the tops once: and the remaining third of the crop the ſcythe did not paſs over. The tops were greedily devoured by his horſes, cattle, and pigs, in the fold-yard, and were equal in quantity and value to a conſiderable crop of clover, cut and made uſe of in the ſame mode. At the end of October he took up the carrot roots and preſerved them in a trench in the manner of potatoes. The crop was full ſix hundred buſhels per acre; and it was not found that the roots of thoſe carrots whoſe tops had been twice cut were at all inferior in ſize or quality to thoſe whoſe tops had been left untouched. A paſſage was left for a ſmall cart to carry off the tops, and another he made by drawing the young carrots wanted for family uſe. He has reaſon to conſider this mode of cultivating carrots equal to the beſt fallow crop, provided the carrots are twice well hoed, and the tops are cut off, as the ſcythe prevents any weeds ſeeding in the autumn. His horſes, oxen, milch cows, and pigs, were fed with the carrot roots; his turkeys and other poultry had them in a boiled ſtate, and were fatted well upon them: even his pigeons were fed upon carrots, as they conſtantly attended in the fold-yard to pick up every particle that dropped from the mouths of the cattle; which ſupply was ſufficient to keep them at home, and to ſave an expence in feeding them in the ſevere weather. The market price of carrots near his houſe, twelve miles eaſt of York, was from ten-pence to one ſhilling a buſhel; at which price it muſt be allowed, he ſays, that the crop was a profitable one. He further remarks, that the demand for carrots in his neighbourhood for ſtallions is not inconſiderable, for it is found that this food is more invigorating and fattening than any other that can be given them.

Though it is a common practice with farmers in Suffolk to allow crops of carrots to remain in the ground all winter, it ought by no means to be generally recommended; as beſides the injury the crop may frequently ſuſtain by ſevere froſts, the farmer muſt often experience great difficulty in getting up a ſufficient quantity of roots for the ſupply of his live ſtock, eſpecially when the earth is bound up by froſt or covered with ſnow. On theſe grounds it is evident that the beſt way of preſerving carrots during winter and ſpring is to dig them up in the end of October, or beginning of November, when their green leaves are decayed, which is a common practice in Leiceſterſhire. In doing this, the beſt method is to make uſe of three-pronged forks, though ſpades are frequently uſed. By looſening the ſoil with either of theſe inſtruments, and drawing up the carrots at the ſame time by the tops, the work is performed in a very expeditious manner. The carrots ſhould be allowed to dry a day or two on the field before they are taken home; on being dug up, when they are dry, the tops may be taken off and given to the ſwine or cattle; and the roots be piled up in heaps in ſome cloſe dry houſe, well covered up, either with ſtraw or dry ſand, ſo as to defend them from froſt and dampneſs. Where the buſineſs of taking up the roots is delayed till November, Mr. Young well obſerves, that in caſe of wet weather they are liable to be much injured. It is obſerved by an Eſſex farmer that it is his practice to take them up on a dry day, put them directly into ſmall upright cocks of ten buſhels each, entirely covered with the tops cut off; they thus appear to dry better than in any other mode; and with very little loſs, to bear the weather. If after being thus dried, they are carried into any barn, or ſhed, it will be better, if in large quantities, on account of the hazard of heating, not to pack them cloſe, but rather throw them promiſcuouſly into heaps with a little ſtraw over them. Some however pile them up in a conical manner with a few of the tops hanging down on the outſide, and others place them in a ridge of earth in the manner of potatoes.

According to the account of Mr. Arthur Young, in Suffolk, a medium crop may be reckoned at three hundred and fifty buſhels the acre, which at ſix-pence the buſhel, the price at which they are ſold to be ſent to the London markets, amounts to 8l. 15s. 0d. the acre. Hence, though the hoeing and digging up of a crop of carrots may be attended with conſiderable expence, the above groſs produce will amply repay, and leave a very handſome profit.

The uſes to which this root are applied are various. Large quantities are ſent to the London markets, and alſo given as food to different kinds of live ſtock. Horſes are remarkably fond of carrots; and it is even ſaid, that when oats and carrots are given together, the horſes leave the oats and eat the carrots. The ordinary allowance is about 40 or 50 lb. a day to each horſe. Carrots, when mixed with chaff, that is, cut ſtraw, and a little hay, without corn, keep horſes in excellent condition for performing all kinds of ordinary labour. The farmers begin to feed their horſes with carrots in December, and continue to give them chiefly that kind of provender till the beginning or middle of May, to which period, with proper care, carrots may be preſerved. As many farmers are of opinion that carrots are not ſo good for horſes in winter, as in ſpring, they give only half the above allowance of carrots, at firſt, and add a little corn for a few weeks after they begin to uſe carrots.

The reſult of the inquiries made by the above author in Suffolk, as ſtated in the ſurvey of that diſtrict, is, that they give "at Sutton ſix horſes two loads a week; no corn, and eat little hay. At Shottiſham, ſix horſes one load a week, with corn; in the ſpring two loads, without corn; eat little hay. At Ramſholt, ſix horſes 72 buſhels a week; no oats, and half the hay ſaved. At Alderton, ſix horſes 42 buſhels a week; oats given, and the ſaving of hay not conſiderable. At Alderton oats given, becauſe not carrots enough. At Holleſley, ſix horſes two loads a week; no corn, ſave more than half the hay." And upon reviewing theſe circumſtances, ſays the ſame writer, "it appears that two loads a week are a very large allowance, probably more than are neceſſary; ſeeing that with 72 buſhels at one place, which is one and three quarters, and one load at another, all the corn is ſaved: let us therefore decide, that when ſix horſes eat 80 buſhels of carrots a week, which is 13 buſhels a week for one horſe, they want no corn whatever, and will eat only half the hay of corn-fed ones. This will enable us to aſcertain the value tolerably, though not exactly, becauſe we do not, ſays he, know what would be the fair allowance of oats to balance ſuch feeding with carrots." The whole turn of the intelligence he received ran, he ſays, upon the vaſt ſuperiority of condition in which horſes are kept by carrots to that which is the reſult of corn-feeding; for this evident reaſon, carrots are given nearly, if not quite, in as large quantities as the horſes will eat them; but the oats are never given in ſuch a manner, they are always portioned out in an allowance far ſhort of ſuch plenty. A quarter and a half of oats would, he is perſuaded, from the general turn of every man's converſation, be inferior to two loads of carrots; this at 20s. is 1l. 10s. and there is to be added the ſaving of half the hay, which may be called 10 pounds per horſe a day, or 70 pounds per week, which, at 50s. a ton, is 1l. 4s. per horſe, and 8s. for ſix; which added to 1l. 10s. for corn, makes in all 1l.

18s. againſt 80 buſhels, or 19s. a load: and that this is a moderate calculation, appears, he thinks, from the decided preference given by ſeveral farmers in favour of carrots at 15s. a load, againſt oats at 20s. a quarter, not reckoning the carrots by any arbitrary eſtimation, but ſuppoſing themſelves forced to buy the one or the other. The prime coſt is calculated at 7s. a load; and that this is fair, will, he thinks, appear by the following ſtatement of the articles:

| | £. | s. | d. |
|---|---|---|---|
| Rent, tythes, and poor-rates | 0 | 15 | 0 |
| Ploughing | 0 | 7 | 0 |
| Harrowing, &c. | 0 | 1 | 0 |
| Seed and ſowing | 0 | 6 | 0 |
| Hoeing | 0 | 18 | 0 |
| Taking up ten loads, at 1s. 2d. per load | 0 | 11 | 8 |
| | 2 | 18 | 8 |

The tenth of which is, he ſays, 5s. 10d. or per buſhel one penny three-farthings; call it, however, two pence per buſhel, or 6s. 8d. per load, and if to ſquare with one article of intelligence it is made 7s. it will not amount to two pence farthing the buſhel: here, therefore, ſays he, another view opens upon us, which is the farmer's profit; the carrots are worth, in feeding his team, 15s. but they coſt him only 7s.; he has therefore the advantage of 8s. a load as the grower, on all his horſes conſume, and on an average 4l. an acre.

Another way by which a friend of his, he ſays, made his calculation, was this: "at one load and a half of carrots, nine loads a moderate acre, laſt ſix horſes ſix weeks." He was inclined to think, from the intelligence, that one load and a half ought to be eſteemed the proper quantity, and ſave ſix

| | £ | s. | d. |
|---|---|---|---|
| quarters of oats, which at 20s. is | £6 | 0 | 0 |
| Three cwt. and a half of hay a week ſaved, 21 cwt. at 2s. 6d. | 2 | 12 | 6 |
| | 8 | 12 | 6 |
| The carrots may coſt | 3 | 3 | 0 |
| Farmers profit per acre by feeding horſes | 5 | 9 | 6 |

It admits of various calculations, ſays the writer; but view it in any light you pleaſe, the reſult is nearly, though not exactly, the ſame. Two facts reſult, he thinks, moſt clearly from the intelligence; viz. that horſes will do upon them as well as upon oats, and that this application will not only pay the charges of culture, but leave a profit nearly as great as the groſs produce of a common crop of wheat. He wonders, therefore, the farmers cultivate them for their own uſe alone, without any view to a ſale. It ſhould farther be remarked, he ſays, that this reſult takes place, not in a diſtrict where the horſes are poor mean animals that betray a want of good food, but, on the contrary, amongſt the moſt uſeful teams that are to be found in England; and that theſe teams are the fatteſt, and in the higheſt condition, when they are ſupported by carrots. No greater proof of the excellency of the food can, he thinks, be wiſhed for, than the horſes going through the barley-ſowing upon it, and the root doing better at that ſeaſon of hard labour than earlier in the winter; this ſeems to ſpeak, he ſays, the heartineſs as well as wholeſomeneſs of the food. One concluſion very naturally ariſes from this part of the intelligence, that the crop, or a conſiderable part of it, ought to be taken up in autumn, and packed in a barn, in which they would much ſooner loſe their juicineſs, and acquire a more withered ſtate, in which they are found to yield the beſt nouriſhment for animals."

But the author of the New Farmers' Calendar, who ſays he has given carrots to horſes of every deſcription, and that the practice is perfectly familiar to him, obſerves "that neither cart nor ſaddle-horſes, although they will perform very well whilſt fed with carrots, are able to go through ſo much labour, or to do it with ſo much eaſe or ſafety to themſelves, as when they are allowed corn; and the only proper application of carrots to horſes is to ſuch as either do not work at all, or very moderately; but ſhould the carrots be ſubſtituted for hay inſtead of corn, it makes a very material difference in the queſtion, and in many caſes ſuch a diſpenſation might be advantageous in all points. If a man can maintain his cart-horſes in good working order and good health, as many really do, upon theſe roots, inſtead of oats, he has nothing farther to ſay, except in praiſe of his economy; he only inſiſts, that the very ſevere labour which he has been accuſtomed to ſee horſes go through, could not be endured without corn; and that he has known horſes abſolutely ruined by working them upon carrots, when the labour was by no means hard enough to have injured them had they been properly fed with corn. He has little to ſay on this ſubject, ſince he has himſelf ſufficiently often ridden and driven horſes carrot-fed, watching their daily condition, and marking even the dew upon their coats, the heaving of their flanks, and the comparative tone of their muſcular exertions." This writer's opinion, however, ſeems chiefly to reſt upon their being a laxative, and conſequently a debilitating food, which is probably not the caſe when they are taken up and kept in a dry place for a proper length of time, ſo that a portion of the juicy material may be diſſipated.

In March this ſort of food is in the greateſt perfection, as much of the ſucculence of the roots is diſſipated, and from their being in ſome degree withered, they bend in the hand. Every part of them is then highly nutrient, being full as hearty a food as oats. It is, of courſe, an object of vaſt importance to the farmer to be well provided with this root for uſe in February, March, and the following months.

Carrots have likewiſe been made uſe of for fattening cattle with great ſucceſs; ſome, indeed, think that this is the moſt advantageous way of applying them; and there cannot be any doubt but that they muſt be highly uſeful in this way; from the great quantity of ſaccharine matter they contain. They have alſo been long proved to be excellent food for milch cows in the ſpring; as they certainly give no bad taſte to the milk or butter, while the quantity of both is greatly increaſed by their uſe. For this laſt uſe they ſhould probably be employed without being much kept, as in that way there will be the largeſt proportion of the juicy liquor in them, which is of advantage in this intention.

Sheep have alſo been frequently fattened on this root in Suffolk; and from Mr. Young's account, who ſeems to have fully conſidered the carrot-huſbandry, a good crop will weigh 11 tons, which quantity, he ſuppoſes, will feed 20 wethers for 100 days, in which ſpace they will be completely fattened. In Norfolk it is reckoned a good crop of turnips that will fatten eight wethers; ſo that it would ſeem that one acre of carrots will go as far in fattening ſheep as two acres and a half of turnips, which is a circumſtance that deſerves the farmer's attention in many ſituations. The ſame writer alſo further ſtates, that the expence of cultivating carrots exceeds that of turnips by 1l. the acre. To counterbalance which, he ſays, the carrots are much more impenetrable to froſt, if left in the ground to be taken up as wanted; that they are not ſubject to any diſtemper ſimilar to that of the fly in turnips; and that they are ſown at a ſeaſon when they cannot ſuffer by drought; while, of late years, turnips have ſuffered ſo much in various ways, as to have ſubjected the farmers, particularly thoſe of Norfolk and Suffolk, to very heavy loſſes. Beſides, as carrots can be preſerved with certainty to an advanced period of the ſpring, as April or May, when the fattening of cattle is more expenſive than at any other ſeaſon, the ſuperiority of carrots over turnips muſt, he thinks, appear evident to every practical farmer. He further adds, that with all theſe advantages, it might naturally be expected that carrots ſhould be more univerſally cultivated, and that the only reaſon why they are not, is becauſe their value is not aſcertained, or made generally known. Some ſuch reaſon as this would appear alſo to be the cauſe why the cultivation of ſo valuable a crop ſhould be confined to one particular diſtrict of the kingdom; which, without doubt, if it were commonly cultivated, would be the means of ſaving an immenſe conſumption of oats, beans, and peas, which are at preſent given to horſes and other animals. This ſort of crop is likewiſe of great utility in the keeping of ſtore-pigs; but they will not probably fatten them without the aſſiſtance of corn or milk. In the experiments of the reverend Mr. Young, this ſeems to have been exactly the caſe, as the hogs, in many inſtances, gained weight, though they did not become fat under this management. See Swine.

The able writer of the Suffolk report has further remarked, that the next circumſtance to be attended to is the advantage of the plant as a preparation for corn; all the minutes agree, ſays he, that the barley after them is good and clean; ſeveral perſons were inclined to think it equal to that after turnips fed on the ground; but the fair reſult is evidently, that if carrots were ſo fed, the barley would be much ſuperior; of this the intelligence he received will not, he ſays, permit us to doubt. It is, however, fair to obſerve, that they one and all declare for putting them in upon clean land, and in this courſe: 1, turnips; 2, barley; 3, carrots; 4, barley, &c.; from which it appears, that on theſe ſandy ſoils they are not to be depended upon for cleaning them when foul with couch.

The utility and advantage of the carrot root have been already ſhewn in many inſtances; it is, however, obvious, that the value of crops of this deſcription muſt vary in a conſiderable degree, according to the manner in which they are employed in their conſumption. The differences have been found to be from two pence halfpenny to two ſhillings the buſhel; in general it may, however, be from about ſixpence to eight-pence, and perhaps in ſome inſtances tenpence or a ſhilling. In the trials of different experimenters, as ſtated in the 25th volume of the Annals of Agriculture, under different modes of application, the reſults were theſe:

| *Application of crop.* | *Value per Buſhel.* | | |
|---|---|---|---|
| In feeding all ſorts of cattle | 0 | 0 | 2½ |
| Average in different ways | 0 | 1 | 0 |
| In fattening oxen | 0 | 0 | 6 |
| In fattening hogs, boiled | 0 | 2 | 0 |
| When uſed inſtead of oats for horſes | 0 | 0 | 6 |
| In fattening hogs, raw | 0 | 0 | 8 |
| In fattening ſheep | 0 | 0 | 4 |

It has been remarked by a late practical writer, that from the great facility of cultivating this ſort of crops, the little riſk that attends them, their very general application in the feeding and fattening of different ſorts of domeſtic animals, the large proportion of manure that they afford, and their great utility in the preparation of the land for grain crops; they may in moſt caſes be conſidered not only preferable to turnips, but much more advantageous and better ſuited to all ſoils of the pure ſandy or light ſandy loam kinds.

It has been ſuggeſted by Mr. Baker, that the large tops of this root might be rendered more extenſively beneficial by having them converted into a ſort of coarſe hay, by mowing them over while in their young, green, juicy ſtate of growth, without injuring the heads or crowns of the plants, ſomewhat in the manner noticed above; and then letting them become perfectly dry on the ground; as in this way, he aſſerts, that two tons of fodder may be produced from an acre of land. It is plain, however, that in this practice injury muſt be done to the growth of the roots, beſides its being uneconomical, on account of the great loſs that muſt take place in the drying of ſuch ſucculent materials, which can be wholly conſumed without it. It is unqueſtionably a much leſs waſteful method of management to have them conſumed in the yards by ſome ſort of ſtock, as they are taken up; becauſe in this way not a particle is loſt, from the great avidity with which almoſt all ſorts of animals devour them.

When it is thought neceſſary to have the roots cleaned before they are given to animals, it may be readily performed in the ſame manner as for potatoes.

The author of the Agricultural Survey of the County of Suffolk concludes this intereſting ſubject with "earneſtly calling on all perſons who have ſand, or light ſandy loams, to determine to emancipate themſelves from the chains in which prejudice or indolence has bound them; to cultivate this admirable root largely and vigorouſly; to give it the beſt ſoil they have; to plough very deep; to hoe with great ſpirit; and to baniſh corn from their ſtables, as a mere luxury and barren expence, that ought to be extirpated: an effect that flows very fairly from the preference which the inſtinct of the four-footed inhabitants generally gives to carrots." They ſhould not, he thinks, be confined to ſmall cloſes of an acre or two, but be introduced regularly in the courſes of the crops of the farm in the ſame manner as wheat, barley, turnips, or any other plant. None, in his opinion, pay better, and very few ſo well; and beſides they are capable of a very general application, no root being fit for ſerving more uſeful purpoſes.

The penalty for ſtealing carrots is the ſame with that for ſtealing turnips, potatoes, cabbages, parſnips, and peas; for which ſee Turnips.

Carrot, *wild*, in *Agriculture*, a weed of the biennial kind frequently met with in paſture lands, where the ſoil is inclined to be dry. Wherever it is found it ſhould be extirpated as ſoon as poſſible before it flowers and ſheds its ſeeds, as if this is not attended to, it will increaſe with rapidity, and become very troubleſome as well as difficult to remove. It has ſometimes the name of *birds' neſt*, from the head, after flowering, contracting ſomewhat into that form. See Daucus.

Carrot, *Candy*, in *Botany*. See Athamanta *creten*ſ*is*.

Carrot, *Deadly*, or *Scorching*. See Thapsia.

Carrot, *Mountain*, a ſpecies of fennel. See Fennel.

CARROUGE, Bertrand-Augustin, in *Biography*, an ingenious aſtronomer of France, was born at Dol, on the 8th of October, 1741, and on account of his merit and indigence, he was appointed "Adminiſtrateur General des Poſtes," by Reveilliere-Lepaux, the director. Notwithſtanding his advancement to this office, which rendered him, in ſome degree, independent, he applied with diligence to aſtronomy. He calculated 1000 ſtars for the celeſtial globe publiſhed by C. Lamarche, ſucceſſor to Fortin, and made many calculations for the "Connoiſſances des Temps," and the ſecond edition of Lalande's aſtronomy. He alſo publiſhed ſeveral memoirs in the "Connoiſſances des Temps," and, a few days before his death, which happened on the 29th of March, 1798, he delivered to Lalande tables for calculating the phaſes of the moon, better, as this hiſtorian of aſtronomy ſays, than thoſe which are in Bouguer's and La Caille's "Elements of Navigation." They are contained in the "Connoiſſances des Temps" for 1801. Lalande's Hiſt. of Aſtronomy for the year 1798.

Carrouge, in *Geography*. See Carouge.

CARROUSAL, or Carrowsal, properly a courſe, or conteſt of chariots and horſes: or a magnificent entertainment, on occaſion of ſome public rejoicing; conſiſting in a cavalcade of ſeveral perſons, richly dreſſed, and equipped after the manner of the ancient cavaliers, divided into ſquadrons, meeting in ſome public place, and practiſing juſts, tournaments, and other noble exerciſes. The term is ſince become of more general uſe, and is given to any merry meetings. The word comes from the Italian *caroſello*, a diminutive of *carro, chariot*. Tertullian aſcribes the invention of carrouſals to Circe; and will have them inſtituted in honour of the Sun, her father: whence ſome derive the word from *carrus*, or *currus ſolis*. The Moors introduced cyphers, liveries, and other ornaments of their arms, with trappings, &c. for their horſes. The Goths added creſts, plumes, &c.

CARR-TAKERS, are officers of the king's houſehold, who, when the court travels, have charge to provide waggons, carts, &c. to tranſport the king's furniture and baggage.

CARRUCA, in *Antiquity*, a ſplendid kind of carr, or chariot, firſt mentioned by Pliny, mounted either on one wheel, like our wheel-barrows, or, as is more probable, on four wheels, richly decorated with gold, ſilver, ivory, &c. in which the emperors, ſenators, and people of condition, were carried. The carrucæ, or coaches of the Romans, were often of ſolid ſilver, curiouſly carved and engraved; and the trappings of the mules, or horſes, were emboſſed with gold. This magnificence continued from the reign of Nero to that of Honorius; and the Appian way was covered with the ſplendid equipages of the nobles, who came out to meet St. Melania, when ſhe returned to Rome, ſix years before the Gothic ſiege. Seneca Epiſt. 87. Pliny H. N. xxxiii. 49. The Romans conſidered it as an honour to ride in thoſe that were remarkably high. In the Theodoſian code the uſe of them is not only allowed to civil and military officers, but enjoined as a mark of their dignity.

The word comes from the Latin *carrus*, or Britiſh *carr*, which is ſtill the Iriſh name for any wheel-carriage.

Carruca was alſo ſometimes uſed for *carrucata*. See Carrucate.

Carruca, in *Rural Economy*, a term employed by ſome old writers to ſignify a plough. It is ſometimes written *Carraca*.

CARRUCAGE, in *Huſbandry*, a term which denotes the ploughing of ground, either ordinary, as for grain, hemp, flax; or extraordinary, as for woad, dyer's weed, rape-ſeed, &c.

Carrucage, *carucagium*, a kind of tax anciently impoſed on every plough, for the public ſervice. See Carrucate and Hidage.

CARRUCATE, or Carucata, in our *Ancient Laws* and *Hiſtory*, denotes a plough land, or as much arable as could be tilled and managed by one plough and the beaſts belonging thereto in a year; having meadow, paſture, and houſes for the houſeholders and cattle belonging to it.

In the Domeſday Survey, the hide and carucate appear to be the ſame; the hide being the meaſure in the Confeſſor's reign; and the carucate that to which it was reduced by the Conqueror's new ſtandard. Thus, different places are ſaid to have paid gold for ſo many hides, T. R. E. in the time of the Confeſſor. And then follows the *exiſting* meaſure of ſo many carucates, "Eſt ix. Carucatarum." Mr. H. P. Wyndham, however, in his "Wiltſhire, extracted from Domeſday Book," 1788, diſtinguiſhes between "hida" and "carucata," though they have hitherto been conſidered as ſynonymous terms. Accordingly, he conjectures, that the firſt was intended to ſignify "the valuation of the eſtate," and the latter "the meaſurement of the land."

In ſome of the counties, as thoſe of Nottingham, Derby, and Lincoln, only carucates are mentioned. But in others, as we have already mentioned, both occur.

The contents, however, of the carucate are very variouſly ſtated; and, in fact, we have no criterion in any one county for judging of its real extent. The Liber Niger, as well as ſeveral of our ancient chartularies, eſteem it to contain a hundred acres; while it is carried by other authorities to a hundred and twenty: and the Liber Elienſis aſſerts, that ſome conſiſted even of two hundred and forty acres. In the early part of the reign of Richard I. it is ſtated to have been eſtimated at ſixty acres; and ſo to have continued till his ninth year, when in the five ſhilling aid, it was fixed at a hundred. In the time of Edward I. it appears to have been more than once eſtimated at a hundred and eighty acres: and in the 23d of Edw. III. a carucate of land in Burceſter contained a hundred and twelve acres, and in Middleton a hundred and fifty. Nor was the calculation of its extent under other circumſtances leſs liable to variation. The Monaſticon Anglicanum (tom. i. p. 75.) ſays, that fourteen carucates made a knight's fee. A manuſcript regiſter of Fountain's abbey, ſixteen. Another mentions twelve. And one of Dodſworth's manuſcripts in the Bodleian goes to forty-eight. A charter of the 5th of Edward III. records, that each of three carucates of land which the abbot of Netley held in the New Foreſt conſiſted of a hundred acres: and a ſimilar meaſure is repeated in a patent of Henry IV.

The meaſurement of the carucate then appears to have been arbitrary, and differs conſiderably not only in different counties, but even in different diſtricts of the ſame county. It appears, likewiſe, to have been various at various times. And for different purpoſes a larger or a leſs number of acres appears to have been required. It ſeems clear, ſays the hiſtorian of Leiceſterſhire, that the commiſſioners, in the ſurvey of that county, at leaſt, from the conviction that hides and carucates were of no certain meaſure, and that they differed ſtill more in quality than they did in meaſure, adopted the very rational mode of determining the value of the land by the number of ploughs that were actually employed, or in their judgment might be employed on it. "We ſometimes find that the number of ploughs is conſiderably leſs than the number of plough-lands; and ſometimes the commiſſioners tell us the land would have admitted of more ploughs than were then in actual uſe. And it is but reaſonable to conclude, that certain lands had been in a better ſtate in the time of king Edward, than they were in the reign of William I. from their having more ploughs at work on them; and, on the contrary, that other lands were much improved at the time of the ſurvey, as they had more ploughs at work than had been employed in the days of the Confeſſor. There are few paſſages in ſome of the counties that can be made intelligible in any other way of interpretation. Nichols's Diſſ. on Domeſd. Pref. to the Hiſt. of Leic. Antiq. Diſc. i. 46, 47. Hutchins's Diſſ. Kelham's Domeſ. Book. Illuſtr. p. 168. Selden. Tit. of Hon. 622. By a ſtatute under William III. for charging perſons to the repair of the highways, a plough-land is rated at fifty pounds per annum, and may contain houſes, mills, wood, paſture, &c. Stat. 7 and 8 Will. III.

CARRUCCI, Jacopo, called *Pontormo*, from the place of his nativity, in *Biography*, was born in 1493, poſſeſſed great natural ingenuity, and in his earlieſt works was admired by Raphael and Michael Angelo. His inſtruction, derived in regular ſucceſſion from Leonardo da Vinci, Albertinelli, and Pier di Coſimo, was completed in the ſchool of Andrea del Sarto, who, by jealouſy and ungenerous treatment, converted the ſcholar into a rival. Notwithſtanding his talents, he frequently changed his ſtyle and became the victim of inconſtancy. The "Certoſa" of Florence exhibits ſpecimens of the three different manners commonly aſcribed to him. The firſt, being correct in deſign and vigorous in colour, approaches the ſtyle of Andrea del Sarto: the ſecond, combining with good drawing a languid tone, became the model of Bronzino and the ſubſequent epoch. The third is a direct imitation of Albert Durer. To theſe might be added a fourth manner, if the freſcoes of the general deluge and univerſal judgment, on which he ſpent eleven years, and his laſt work, had not been white-waſhed, with the tacit acquieſcence of all contemporary artiſts. In this labour he ſtrove to imitate Michael Angelo, and to exemplify, like him, anatomic ſkill, which was then becoming the favourite purſuit of Florentine art. This artiſt died in 1558, aged 65. Pilkington, by Fuſeli.

CARRYING, in *Falconry*, ſignifies a hawk's flying away with the quarry.

Carrying is one of the ill qualities of a hawk, which ſhe acquires either by a diſlike of the falconer, or not being ſufficiently broke to the lure.

Carrying, among *Huntſmen*. When a hare runs on rotten ground (or even ſometimes in a froſt), and it ſticks to her feet, they ſay ſhe *carries*.

Carrying, among *Riding-Maſters*. A horſe is ſaid to *carry* low, when, having naturally an ill-ſhaped neck, he lowers his head too much. All horſes that arm themſelves *carry* low; but a horſe may *carry* low without arming. A French branch, or gigot, is preſcribed as a remedy againſt *carrying* low.

A horſe is ſaid to *carry* well, when his neck is raiſed, or arched, and he holds his head high and firm, without conſtraint.

Carrying *wind*, a term uſed by our dealers in horſes to expreſs ſuch a one as frequently toſſes his noſe as high as his ears, and does not carry handſomely. This is called *carrying wind;* and the difference between *carrying* in the wind, and beating upon the hand, is this: that the horſe who beats upon the hand, ſhakes the bridle and reſiſts it while he ſhakes his head; but the horſe that carries in the wind puts up his head without ſhaking, and ſometimes beats upon the hand. The oppoſite to *carrying* in the wind, is arming and *carrying* low; and even between theſe two there is a difference in wind.

CARS, Laurence, in *Biography*, a French engraver of great merit, flouriſhed about the year 1760, and reſided at Paris. His prints were numerous; and the following are from Le Moine, viz. a portrait of "Louis XIV. ſurrounded with emblematical figures;" "Hercules and Omphale;" Perſeus and Andromeda;" "Time and Truth," and "Nymphs Bathing." Strutt.

Cars, in *Geography*, ſuppoſed by ſome to be the *Chorſa* of Ptolemy ſeated on the banks of the Euphrates, a city of Armenia, the laſt town of Turkey towards the frontiers of Perſia. It is built on a riſing ground, expoſed to the ſouth-ſouth-eaſt. It is defended by a caſtle, built on a ſteep rock, and has behind it a deep valley, watered by a river, which, not far from thence, diſembogues itſelf into the Arpagi, without ever coming near the city of Erzeron, contrary to the deſcription given of it by Sanſon. Theſe two rivers joined together are known by the name of Arpagi, and ſerve as a frontier to the two empires. N. lat. 41° 30′. E. long. 43° 50′.

Carse, or *Carſe of Gowry*, a diſtrict of Perthſhire, in Scotland, lying on the N. ſide of the Tay, extending 14 miles in length from Dundee to Perth, and being from two to four in breadth. It is a rich plain country, cultivated like a garden, and producing as good harveſts of wheat as any in Great Britain. Its ſituation, however, is damp and low, ſo that the inhabitants are ſubject to agues, and the common people are in great want of fuel for firing.

CARSEOLI, in *Ancient Geography*, a town of Italy, belonging to the Sabines at the 22d mile on the Valerian way. Livy calls it in one place a town of the Marſi, and in another a town of the Æqui; and it might probably have been occupied by one and the other of thoſe people alternately. Livy ſays that it was a Roman colony, eſtabliſhed in the year of Rome 454; and in the map of M. D'Anville it is marked in the country of the Sabines. The preciſe ſituation of this place was not known till it was diſcovered, in 1645, by Holſtenius, near the mountains called "Rio-Fieddo," and it has been again aſcertained, in 1766, by the abbé Chauppy. From an ancient inſcription found in this place it appears, that this city was a colony, and that it had a college of prieſts called "Dendrophori," conſecrated probably to ſome rural deity.

CARSIDAVA, a town of Dacia, according to Ptolemy, ſuppoſed to be the preſent Kuryma.

CARSOLI, in *Geography*, a ſmall ill-built town of Naples, ſeated on the ſide of a ſteep hill, which ſhuts up a defile of the mountains. It is juſt within the limits of the Neapolitan ſtate, for in the plain below is the point of diviſion at an inn called "Il Cavaliere," where ſome cuſtom-houſe officers are ſtationed. This town bears the name of the ancient city of Carſeoli, though its ruins lie near a mile off in the plain. Carſoli is a portion of the immenſe demeſne poſſeſſed by the conſtable Colonna, who has 37 manors in this neighbourhood.

CARSTARES, William, in *Biography*, an eminent Scots clergyman, was the deſcendant of an ancient family, and born in 1649 at Cathcart, near Glaſgow. Having received the rudiments of his education in the academy of a Preſbyterian clergyman, where he formed many important connections, and where he acquired a fluency of expreſſion in the Latin language, as no other was allowed to be ſpoken in his family; he purſued his theological and philoſophical ſtudies in the univerſity of Edinburgh, and afterwards at Utrecht, whither his father ſent him for the purpoſe of avoiding thoſe political conteſts which agitated the reign of king Charles II., and to which his active and enterpriſing ſpirit ſeemed to incline him. Here, however, he was involved in thoſe political intrigues which were occaſioned by the alarm excited in England about the Popiſh ſucceſſion. By means of a letter of recommendation, obtained from a phyſician in London, who carried on a correſpondence with perſons belonging to the court of the prince of Orange, he was introduced to the penſionary Fagel, and afterwards to the prince himſelf; and by him he was entruſted, on account of his ſagacity and information with regard to the ſtate of political parties at home, and his ardent attachment to the intereſts of civil and religious liberty, with his deſigns relating to Britiſh affairs. During his reſidence in Holland, his principles, both in religion and politics, were ſtrongly confirmed; and upon his return to his native country, he entered with zeal into the counſels and ſchemes of thoſe noblemen and gentlemen who oppoſed the tyrannical meaſures of government. His political engagements, however, did not divert him from purſuing the profeſſion of divinity; and when he had paſſed through his previous examinations, he obtained a licence to preach. But as he had no proſpect of uſefulneſs in his clerical character, and as his mind ſeemed to have acquired a decided bias towards politics, he determined to reviſit Holland. On his way thither he paſſed through London, and was employed by Argyle, and the other Scots patriots, in treating with the Engliſh excluſioniſts. Towards the cloſe of the year 1682, he held various conferences with the heads of that party, which terminated in his being privy to what has been called the "Rye houſe plot." Accordingly, he was committed to cloſe cuſtody in the Gate-houſe, Weſtminſter. After ſeveral examinations before the privy council, he was ſent for trial to Scotland; and as he refuſed to give any information reſpecting the authors of the excluſion ſcheme, he was put to the torture, in order to extort from him a confeſſion. This cruel treatment he endured with invincible firmneſs; but when milder methods of a more inſidious nature were adopted, and a pardon was propoſed, with an aſſurance that no advantage ſhould be taken of his anſwers as evidence againſt any perſon, his reſolution failed, and he conſented to anſwer their interrogatories. The privy council immediately cauſed to be printed a paper, entitled, "Mr. Carſtares's Confeſſion," which contained, as he ſaid, a falſe and mutilated account of the whole tranſaction; and in direct violation of their promiſe, they produced his evidence, as they termed it, to be produced in open court againſt one of his moſt intimate friends. This treachery and its conſequences very deeply affected him; but as ſoon as he was cleared, he obtained permiſſion to retire to Holland, towards the cloſe of the year 1684, or the beginning of 1685, where he was kindly received by the prince of Orange, who appointed him one of his chaplains, and cauſed him to be elected miniſter of the Engliſh Proteſtant congregation at Leyden. In this ſituation he was ſingularly uſeful to the prince and his party in concerting thoſe meaſures that terminated in the revolution. When the prince determined to tranſport an army to England, Carſtares accompanied him as his chaplain, and continued about his perſon till the ſettlement of the crown. During the whole of this reign he was the chief agent between the church of Scotland and the court, and he contributed by his influence with the king to the eſtabliſhment of preſbytery in Scotland, to which his majeſty was diſinclined, and to that coaleſcence or accommodation on the part of the Preſbyterian clergy with the Epiſcopalians, which the bigotry of the former made it difficult for him to effect. When an act was paſſed, in 1693, by the Scots parliament, obliging all officers, civil and eccleſiaſtical, to take an oath of allegiance, and alſo to ſign an *aſſurance*, (as it was called), declaring William to be king *de jure*, as well as *de facto*, the miniſters refuſed to ſign the declaration, and appealed to the privy council, who recommended to the king to enforce the obligation. Accordingly, meaſures were adopted for this purpoſe; and the body of the clergy applied to Carſtares, requeſting his interference in their favour. The king perſiſted in his reſolution; orders were renewed in peremptory terms, and diſpatches were actually delivered to the meſſenger to be forwarded next morning. In theſe critical circumſtances Carſtares interpoſed; he haſtened to the meſſenger at night, demanded the diſpatches, which had been delivered to him in the king's name, and inſtantly repaired to Kenſington, where he found his majeſty gone to bed. Having obtained admiſſion into his chamber, he gently waked him, fell on his knees, and aſked pardon for the intruſion, and the daring act of diſobedience of which he had been guilty. The king at firſt expreſſed his diſpleaſure; but when Carſtares further ſtated the caſe, his majeſty cauſed the diſpatches to be thrown into the fire, and directed him to ſend ſuch inſtructions to the royal commiſſioners of the general aſſembly as he thought moſt conducive to the public good. In conſequence of this ſeaſonable interpoſition, the oath and aſſurance were diſpenſed with on the part of the clergy. By this timely ſervice Carſtares acquired the confidence of the Preſbyterian party to ſuch a degree, and he ſo ſucceſsfully cultivated the friendſhip of the earl of Portland, and other men of influence about the court, that he was regarded in the management of Scots affairs, as a kind of viceroy for Scotland, though he poſſeſſed no public character. Although he acted with conſummate prudence and delicacy, he could not eſcape envy: but he retained the eſteem of thoſe whom he moſt valued; and the king once ſaid of him, in the preſence of ſeveral of his courtiers, "that he had long known Mr. Carſtares; that he knew him well, and knew him to be an *honeſt man*."

Although, after the death of king William, Carſtares was not much employed in public affairs, queen Anne continued him in the office of royal chaplain for Scotland, and obtained for him the offer of an appointment to the vacant place of principal of the univerſity of Edinburgh; which he accepted in 1704, with the firſt profeſſorſhip of divinity. After this appointment, whilſt he refuſed any addition to his own ſalary, he uſed his influence at court for augmenting the very ſmall ſalaries pertaining to the regents in the ſeveral univerſities of Scotland; and in the execution of his office, as principal, he ſecured the affection and reſpect of thoſe that were ſubject to his authority, by the dignified affability and gentleneſs of his deportment. In the year of his appointment to the principalſhip of the univerſity, he was unanimouſly invited to the paſtoral office in one of the pariſhes of Edinburgh, which he performed with exemplary diligence; and as moderator of the general aſſembly, which poſt he occupied four times in eleven years, he maintained great weight in its debates. When the union of the two kingdoms was agitated, it engaged his cordial concurrence, and he was the principal inſtrument of preventing any public oppoſition from the preſbyterian clergy. His efforts to control the bigotry of this body rendered him unpopular; and with a view of gaining their good opinion, he accepted the office of one of the agents, ſent to London to oppoſe the bills for the reſtoration of patronage in Scotland, and for the toleration of the epiſcopal clergy; though in the latter inſtance, at leaſt, his oppoſition muſt have counteracted his principles. His excuſe ſeems to have been an apprehenſion that the Scots epiſcopalians wiſhed the exiled family to be reſtored. His efforts, however, whether they were ſincere or not, proved unſucceſsful. To the ſucceſſion of the houſe of Hanover he gave his active ſupport; and he obtained from the general aſſembly an addreſs of congratulation to George I. on his acceſſion to the throne; and in return for this ſervice his office of royal chaplain was continued. His death happened ſoon after this event, in December, 1715. "His private character was highly reſpectable. His religion was free from enthuſiaſm and ſuperſtition, and his charity and bounty comprehended all ſects and parties. His memory is revered by his countrymen as that of a true and enlightened patriot, and few have held an active courſe amidſt violent public contentions with leſs reproach." See State papers and letters, addreſſed to William Carſtares, confidential ſecretary to king William, during the whole of his reign, afterwards principal of the univerſity of Edinburgh, relating to public affairs in Great Britain, but more particularly in Scotland, during the reign of king William and queen Anne; to which is prefixed the life of Mr. Carſtares; publiſhed from the originals, by Joſeph M'Cormick, D.D. miniſter at Preſton-pans. 1774. 4to. Biog. Brit.

CARSULÆ, in *Ancient Geography*, a town of Italy, in Umbria, ſituate between Narnia and Mavania, on the Flaminian way. According to Strabo it was a place of conſiderable note, and from Tacitus we learn, that it was about 10 miles diſtant from Narnia. Livy aſſigns it to a people called Carſuli.

CARSUM, a town of Lower Moeſia, according to Ptolemy. It is placed in the Itinerary of Antonine between Capidava and Cion.

CARSUMBLIA, in *Geography*, a town of European Turkey, in the province of Servia; 12 miles W. of Precop.

CARSUS, in *Ancient Geography*, a river of Aſia, in Cilicia; which ſprung in mount Amanus, near the town of Erana, ran to the ſouth-weſt between the branches of this mountain, watered the town of Epiphania, and diſcharged itſelf into the Mediterranean, at the bottom of the gulf "Iſſicus."

CART, a vehicle mounted on two wheels, drawn by horſes, uſed for the carriage of heavy goods. The word ſeems formed from the French *charette*, which ſignifies the ſame; or rather the Latin *caretta*, a diminutive of *carrus*. See CARR.

Mr. Sharp's *rolling cart* is fixed upon two rollers, running a-breaſt, or parallel with each other, and both placed under the body of the cart, working upon pivots like the wheel of a wheel-barrow. The rollers are both cylinders of caſt iron, two feet diameter, and ſixteen inches broad. An iron ſpindle paſſes through the centre of each roller, upon the ends of which reſt the four planks that ſupport the body of the cart. Criminals are drawn to execution on a cart. Bawds, and other malefactors, are whipped at the cart's tail.

Scripture makes mention of a ſort of carts or drags, uſed by the Jews to do the office of threſhing. They were ſupported on low thick wheels, bound with iron, which were rolled up and down on the ſheaves to break them, and force out the corn. Norden and Niebuhr, in their "Travels," inform us, that this method of threſhing is ſtill practiſed in Egypt and Arabia. The former ſays that in Egypt they threſh, or rather tread, rice by means of a ſledge drawn by two oxen, and that the man who drives them is upon his knees, whilſt another has the care of drawing back the ſtraw, and of ſeparating it from the grain that remains underneath. In order to tread the rice they lay it on the ground in a ring, ſo as to leave a void circle in the middle. The Arabians, ſays the latter writer, in threſhing their corn, lay the ſheaves down in a certain order, and then lead over them two oxen, dragging a large ſtone. They uſe oxen in Egypt, he adds, as the ancients did, to beat out their corn by trampling upon the ſheaves, and dragging after them a clumſy machine. This machine is not, as in Arabia, a ſtone cylinder; nor a plank with ſharp ſtones, as in Syria; but a ſort of ſledge, conſiſting of three rollers, fitted with irons which turn upon axles. A farmer chooſes out a level ſpot in his fields, and has his corn carried thither in ſheaves upon aſſes or dromedaries: two oxen are then yoked in a ſledge; a driver gets upon it, and drives them backwards and forwards, or rather in a circle upon the ſheaves, and freſh oxen ſucceed in the yoke from time to time. By this operation, the chaff is very much cut down; the whole is then winnowed, and the pure grain thus ſeparated. Something of the like kind alſo obtained among the Romans, under the denomination of *plauſtra*, of which Virgil makes mention. Georg. I.

*Tardaque Eluſinæ matris volventia plauſtra,*
*Tribulaque, traheaque*——

On which Servius obſerves, that *trahea* denotes a cart without wheels, and *tribula* a ſort of cart armed on all ſides with teeth, uſed chiefly in Africa, for threſhing corn. The Septuagint and St. Jerom repreſent theſe carts as furniſhed with ſaws, inſomuch that their ſurface was beſet with teeth. David having taken Rabbah, the capital of the Ammonites, ordered all the inhabitants to be cruſhed to pieces under ſuch carts, moving on wheels ſet with iron teeth; and the king of Damaſcus is ſaid to have treated Iſraelites in the land of Gilead in the ſame manner. 2 Sam. xii. 31. Amos. i. 3. Calm. Dict. Bibl. tom. 1. p. 366.

CART, in *Agriculture*, is a carriage or vehicle conſtructed with two or more wheels, and drawn by one or more horſes. It is employed for the purpoſe of conveying manure, hay, grain, and various other articles which are connected with the farm. Carts are made of different forms and dimenſions, in ſome diſtricts according to the nature of the materials they are intended to carry, and the uſes to which they are applied; but by ſuitable contrivances they may be eaſily conſtructed, ſo as for the ſame cart to ſerve different uſes. In the more ſouthern parts of the kingdom this is moſtly the caſe, by which there is not only a conſiderable ſaving, in fewer carts being wanted, but likewiſe in leſs room being taken up by them in the ſheds or houſes where they are kept. In theſe ſituations they are moſtly formed in a cloſe manner, having ladders or other ſimilar contrivances applied when they are wanted to convey any of the more bulky ſorts of materials, ſuch as hay, ſtraw, &c.

It is obvious that the chief object in the conſtruction of carts ſhould be to adapt the wheels and axle in ſuch a manner, that the power may be applied in the moſt favourable direction for draught, and that the carriage may move with the leaſt poſſible force. In this view the height of the wheels ſhould likewiſe be well adapted to that of the animals which are employed in drawing them; but the exact heights which are the moſt favourable under different circumſtances have not yet been fully ſhewn by any trials that can be fully depended upon. There is likewiſe another point which ought to be particularly conſidered in the making of farm-carts, which is, that they are not more heavy than is neceſſary; which is too often the caſe in the ſouthern parts of the iſland. It has been remarked that the large heavy carts and waggons, which are ſo common in the ſouthern diſtricts, are not only reprobated, but almoſt wholly in diſuſe in thoſe of the north, where ſmall carts are in general uſe. Though there cannot be any doubt but that carts muſt vary in their forms, ſizes, and modes of conſtruction, according to the nature and ſituation of the roads, and many other local circumſtances; yet for the purpoſes of farming, eſpecially in field work, probably thoſe of the light, ſingle, and two horſe kind may in general be the moſt advantageous, convenient, and uſeful.

It has been obſerved, in the twenty-ſeventh volume of the Annals of Agriculture, by lord Robert Seymour, that "the advantages of ſingle-horſe carts are, he believes, univerſally admitted, wherever they have been attentively compared with carriages of any other deſcription. By his own obſervation he is led to think that a horſe, when he acts ſingly, will do half as much more work as when he acts in conjunction with another; that is to ſay, that two horſes will, ſeparately, do as much work as three conjunctively: this ariſes, he believes, in the firſt place, from the ſingle horſe being ſo near the load he draws; and, in the next place, from the point or line of draught being ſo much below his breaſt, it being uſual to make the wheels of ſingle horſe carts very low. A horſe harneſſed ſingly has nothing but his load to contend with, whereas when he draws in conjunction with another, he is generally embarraſſed by ſome difference of rate, the horſe behind or before him being quicker or ſlower than himſelf; he is likewiſe frequently inconvenienced by the greater or leſſer height of his neighbour: theſe conſiderations give, he conceives, a decided advantage to the ſort of cart he is recommending." If any other is wanted, that "of the very great eaſe with which a low cart is filled may, he ſays, be added: as a man may load it, with the help of a long-handled ſhovel or fork, by means of his hands only; whereas, in order to fill a higher cart, not only the man's back, but his arms and whole perſon muſt be exerted." To the uſe of ſingle horſes in draught he has heard no objection, unleſs it be the ſuppoſed neceſſity of additional drivers created by it: the fact however is, that it has no ſuch effect; for, horſes once in the habit of going ſingly, will follow each other as uniformly and as ſteadily as they do when harneſſed together; and accordingly we ſee, ſays he, "on the moſt frequented roads in Ireland, men conducting three, four, or five, ſingle horſe cars each, without any inconvenience to the paſſenger: ſuch likewiſe, is the caſe in this country, in which lime and coal are generally carried upon pack-horſes, where one man manages two or three, and ſometimes more." And in a preceding volume of the ſame work, Mr. Young is decidedly of the ſame opinion, which he clearly ſhews to be founded in truth, by entering into a variety of diſcuſſion in reſpect to the points in which they are preferable to tumbrils or waggons. In the northern diſtricts they uſually draw in theſe carts from twelve to twenty-four hundred weight, and where the roads are good, occaſionally thirty, with much eaſe and facility.

And Mr. Donaldſon, in his view of the "Preſent State of Huſbandry in Great Britain," ſeems to think that, "for carrying on the ordinary operations of huſbandry, carts drawn by two horſes are greatly ſuperior to large, cumberſome, unwieldy waggons, that require four, five, or ſix horſes to move them along. It has of late," ſays he, "been a ſubject pretty much agitated, whether ſingle-horſe carts are not to as great a degree ſuperior to thoſe drawn by two horſes, as theſe have been repreſented to be to waggons. Single-horſe carts are certainly loaded and unloaded with much leſs trouble, and are in every way more eaſily managed, eſpecially when carrying out dung, or when uſed for doing any odd jobs on a farm." It has alſo been found, from long experience and the moſt attentive obſervation, that "one horſe will draw, on any road, two-thirds of the load that two horſes, drawing in a line, and of equal power, are capable of doing. The carters of the town of Falkirk, in Stirlingſhire, for example, have long been famous for the great weights drawn by their carts. Before the navigable canal between the Forth and Clyde was made, the whole goods tranſported to and from Glaſgow, and the ports upon the Forth, were," ſays he, "drawn upon one and two-horſe carts belonging to theſe carters; the moſt expert of whom have long given the preference to carts drawn by one horſe, as they experience no difficulty in carrying upon a cart, drawn by a ſingle horſe, from Borrowſtounneſs to Glaſgow, a diſtance of upwards of thirty miles, and of indifferent road, from twenty to thirty-five hundred weight." It is, he obſerves, further worthy of remark, that "at the great iron-work at Carron, the company engaged in it formerly made uſe of waggons and waggon-ways, to wheel their coals and other heavy articles upon: but have entirely laid aſide the uſe of them, and on principles of economy, employed carters with ſingle-horſe carts to tranſport the heavy articles which they require."

In the agricultural report of Northumberland it is likewiſe remarked, that "ſingle-horſe carts are becoming more prevalent in ſeveral parts of that county; and that Mr. James Johnſon, a common carrier at Hexham, has a horſe, ſixteen hands high, that commonly carries from Hexham to Newcaſtle 24 cwt., and 20 cwt. back again; and there are inſtances of his having carried 26 cwt. from Newcaſtle to Hexham, which is a very banky, heavy-pulling road." It is alſo further noticed that "the neateſt, moſt uſeful, and beſt contrived carts we know, are thoſe made in many parts of the North-Riding of Yorkſhire. The ſingle-horſe carts of this conſtruction, uſed for carrying coals from the county of Durham into Yorkſhire, are 60 inches long, 36 inches wide, and 18 deep, hold 24 buſhels of coals, when ſet round the ſides with large ones and upheaped. A man, or boy, drives three of theſe, two of which are equal to the greateſt quantity ever carried by three horſes." Mr. Charge of Newton, ſends three of theſe carts for coals every day, which bring 72 buſhels, the diſtance of 26 miles, there and back, which is performed in 12 hours by one man. The ſame gentleman's two-horſe carts bring 36 buſhels of the ſame coals.

And in the agricultural ſurvey of Cumberland, the writers ſay, "the advantages of ſingle-horſe carts are ſo well underſtood in this county, that we did not ſee any other uſed. Three ſingle-horſe carts are driven without any difficulty, by a man, or boy, or even women and girls."

The author of the Agricultural Report of Mid Lothian, ſtates, that "the wheel-carriages employed in huſbandry are only the cloſe-cart and the corn-cart, both of a light conſtruction, drawn by two horſes, and of late by one. The large wains, or heavy four-horſe waggons, employed in Engliſh huſbandry, are diſcarded there. Two horſes in a cart are commonly loaded with 18 or 20 cwt. One horſe draws ſtill more eaſily 12 cwt.; even 24 cwt. is frequently put on a ſingle horſe; and 30 cwt. on good roads is not uncommon." And that "the firſt ſort of cart has lately been much improved: when placed on its axle, the bottom at each ſide projects over the inner head of the naves as far as nearly to touch the ſpokes of the wheels; from which acquired breadth the capacity is enlarged; while the ſide-ſtandards, being brought nearer to a perpendicular, are able to ſuſtain more weight." The dimenſions are, the length five feet three inches; the breadth below, four feet; the breadth above, four feet three inches; the depth, one foot three inches; containing about a cubic yard. The price of a cart, painted, 1l. 15s. not including wheels, axle, or mounting, which may amount in all to ſeven or eight pounds more. The wheels are generally 52 inches high, the axle commonly of iron, from an idea, that, in the end, it is more economical to have them ſo: for it is not found in practice that iron axles are either more or leſs difficult to draw, although not half the thickneſs, of thoſe of wood."

It has been ſuggeſted on the ground of much experience, that, in conſtructing carts of this ſort, the capacity of waggons is by no means an accurate rule to proceed by; as on finding that they contained in the bed, or *buck*, ninety-ſix cubical feet, being twelve feet long, four feet wide, and two feet in depth; it was ſuppoſed that to give one horſe the fourth part of the load of four, it would only be neceſſary to let the cart have the ſpace of twenty-four cubical feet, or to make it four feet by three, with the depth of two; but from the vaſt ſuperiority of horſes working ſingly, over thoſe in teams, it was ſoon diſcovered, that they required to be very conſiderably enlarged, admitting of having the dimenſions of five feet one inch in length of bed or *buck*, three feet ſeven inches in breadth, with two feet in depth; ſo as to contain thirty-five cubical feet and a fraction. This, therefore, affords a further ſtriking proof of the great ſuperiority theſe ſmall carts have over thoſe of the large kind, in the quantity of work which they are capable of performing.

In ſpeaking of the advantage of having low caſt-iron wheels, it is remarked by lord Seymour, in the paper juſt mentioned, that "the price of iron, caſt into wheels, is 16s. per cwt., and the weight of each wheel about three quarters of a cwt. Two inconveniences only, he believes, have been found from the uſe of low caſt-iron wheels: the firſt is, that caſt-iron is very liable to breakage, upon concuſſion; the next is, that the courſe of ſo ſmall a diameter creates a very quick conſumption of greaſe. The firſt of theſe objections is in a degree removed by the eaſe with which the rim of the wheel is repaired by the application of worked iron, which being joined to it by a rivet, the wheel acquires ſome little elaſticity, and thereby becomes perhaps ſtronger than when it was new. In order that the ſupply of greaſe may keep pace with the conſumption, he has introduced four grooves, or cavities, in the boxes, increaſing a little towards their centres; and in order to defend the axle-tree, which conſiſts of worked iron, againſt the harder body of the box, he has ſteeled the extremity of it."

Theſe ſmall carts are conſidered by many, from actual experience, to be better adapted to the carrying of all ſorts of materials except thoſe of the very bulky kinds, and ſuch as trees, blocks of ſtones, &c. the weights of which might injure them, and which cannot from their nature admit of diviſion. In all hilly diſtricts where the roads are of an inferior kind, and the inhabitants poor, theſe are the carts that are in moſt general uſe, and which are found the moſt advantageous. The ſuperior goodneſs of the roads in ſome of the northern parts of the kingdom have likewiſe been aſcribed to the uſe of theſe kinds of carts, as large carriages of all ſorts that require the wheels to be locked in deſcending hills, are the deſtruction of roads.

By the author of the New Farmer's Calendar it is ſtated that "of the great ſaving to be made by one-horſe carts there can be no doubt, ſince it has been experimentally proved, and was moreover, eaſily to be diſcovered from juſt theory. More weight may be drawn by ſix horſes in ſo many carts, than by eight in a large waggon; and one man may manage two carts in the country." There are, however, he thinks, "ſome peculiar inconveniences attendant upon this plan, which are ſufficiently obvious; and, ſays he, notwithſtanding it has been, for years paſt, ſo warmly recommended by very powerful pens, it never has, nor probably ever will be, reliſhed by the generality of farmers."

After this view of the nature of carts in general, and of the particular advantages of ſingle-horſe carts; it may be uſeful to deſcribe the different ſorts of carts that are employed in the buſineſs of huſbandry.

*Cloſe cart*, a name given to all ſuch carts as have no ladders, rails, or wings, attached to them. They are made cloſe by boards, and moſtly employed in conveying dung, gravel, earth, or ſuch other materials as have conſiderable weight, in a ſmall compaſs. By the application of wings or ladders to them, they are however, frequently made to ſerve the double purpoſe of conveying heavy cloſe matters as well as thoſe of a light bulky nature. This ſort of cart is repreſented at *fig.* 3. *Plate* III. of *Agriculture.*

*Corn cart*, is that ſort of cart which is only placed occaſionally on wheels, for carrying hay, corn in the ſtraw, or other light bulky articles; carts of this kind are generally compoſed of ſtandard rods, and ſpars, without deals, but broader and much longer than the cloſe cart, that they may hold a more bulky load. They coſt from 20s. to 30s. in Scotland, but in England they are conſiderably higher. They are commonly employed in the northern parts of the kingdom for carrying hay, grain in the ſtraw, and other ſimilar bulky materials. A cart of this ſort is ſhewn at *fig.* 4. *Plate* III.

*Coup cart*, a cart of the cloſe kind, ſo denominated from the body-part reſting on a ſort of frame, to which it is kept by means of ſtaples, or other contrivances, through which a caſt-bar, or wooden pin, is put, by which it is confined, and which can be readily removed when the load is to be either partially or wholly diſcharged. Carts of this ſort are generally uſed in putting dung upon land, and are convenient for many other purpoſes in huſbandry. See *fig.* 3. *Plate* III.

*Drag cart*, a ſort of cart invented by lord Sommerville, which is conſtructed with a drag, or ſome other contrivance, for checking, or regulating the rapidity of the motion in going down hills, or other declivities. A full account of this cart has been given in the ſecond volume of "Communications to the Board of Agriculture." At *fig.* 5. in *Plate* III. is a perſpective view of a cart of this ſort to be drawn by two ſtrong oxen, by a pole, yoke, and bows, made to carry 45 cwt. In the front of this *figure* is repreſented the method which his lordſhip has contrived for adjuſting the poſition of the centre of gravity of the load, to prevent its preſſing too much on the cattle in going down hill, the front of the cart being elevated by means of a toothed rack ſcrewed to the front of the cart, and worked by a pinion, and the handle, *a*, immediately connected with the pole, *e*. By means of this pinion and rack, the front of the carriage is elevated more or leſs, in proportion to the declivity of the hill, by which means the weight of the load is made to bear more on the axis, and leſs on the necks of the oxen.—On the ſide view of this cart is repreſented the manner of applying the friction-drag, which is made to preſs more or leſs on the ſide of the wheel, according to the ſteepneſs of the deſcent:—*bb* is the friction-bar, or drag, the one end of which is connected with the tail of the cart by a ſmall chain, and the other end to the front, by means of a toothed rack, *bd*, which catches on a ſtaple in the front of the cart, by which the friction-bar may be made to preſs on the ſide of the wheel, more or leſs, at the diſcretion of the driver: the notches or teeth in this rack, it is obſerved, ſhould be as cloſe to each other as circumſtances will permit. And in this repreſentation, the friction-bar is, he remarks, applied lower upon the wheel than was at firſt propoſed, in order to divide the preſſure and friction more equally on the oppoſite ſides of the wheel, ſo that the preſſure on each is diminiſhed, the riſk of over-heating and deſtroying the friction-bars is alſo rendered leſs, than if the whole preſſure was applied in one point on the top of the wheel. The weight of the iron-work of this cart is 2 cwt. 20 lb. This is unqueſtionably an uſeful contrivance for hilly diſtricts. At *fig.* 5. in the ſame *Plate*, is a ſide view of a cart of this kind of a ſmaller ſize, to carry 25 cwt. and to be drawn by ſteers, or ſmall oxen, with the friction-drag, *bb*, out of uſe; and repreſenting another and more ſimple method of adjuſting the centre of gravity of the load to the declivity of the deſcent: *ab* is part of the arch of a circle, whoſe radius is nearly equal to its diſtance from the axis of the cart, and having ſeveral holes in it, through which a ſtrong iron pin is put, to keep the body of the cart at any deſired inclination with the pole:—*c*, a ſmall chain to prevent the body of the cart being thrown too far back, through the careleſſneſs of the driver in adjuſting it:—*dd*, the upper ſtage of the cart, for carrying bulky loads.—The weight of iron in this cart is 1 cwt. 30 lb. This is a very uſeful, neat, light ſort of cart for many purpoſes.

The advantages of the friction-drag, and other contrivances in this cart, according to the ingenious account of Mr. Cumming, contained in the ſame volume, are,

"1. The method, which is equally ſimple and expeditious, of adjuſting the centre of gravity of the load, ſo as to have a proper bearing on the horſes or cattle in going down hill, the advantage of which muſt be obvious to every man of ſcience, more eſpecially with bulky loads, in which the centre of gravity lies high.

2. The method of applying friction to the ſide of the wheel to regulate the motion of the carriage in going down hill (inſtead of locking the wheels), the advantages of which method appear to be as follow: namely, 1ſt. The preſſure and degree of friction may with great expedition be adjuſted to the ſteepneſs of the declivity, ſo that the carriage will neither preſs forward, nor require much exertion to make it follow the cattle. 2dly. The friction is ſo applied to the wheel, that a given preſſure will have twice the effect in retarding the progreſs, that it would have if immediately applied to the body of the carriage, or to the axis: and by applying the friction on both ſides of the wheel, the riſk of heating and deſtroying the friction-bar is much leſs than if the ſame degree of friction was applied in one place. 3dly. This apparatus is ſo conveniently placed, that it can be inſtantly applied or adjuſted, without ſtopping the carriage, or expoſing the driver to the ſame danger as in locking a wheel. And, 4thly. This uſeful contrivance, in which he ſays ſimplicity and ingenuity are ſo happily blended, will aſſume yet greater importance when applied to both the hind wheels of waggons, by which means the reſiſtance may always be proportioned to the ſteepneſs of the deſcent, the tearing up of the road prevented, the unneceſſary exertion of the cattle in drawing the locked carriage down hill avoided, the danger to which the driver is ſometimes expoſed in locking the waggon wheel totally avoided, and the time now loſt in locking and unlocking the wheel ſaved to the proprietor." Theſe are certainly advantages of much importance in many diſtricts where the roads are hilly.

At *figs.* 7 and 8 in the ſame *Plate* are views of carts to be drawn by a ſingle horſe, by ſhafts. By an attentive compariſon of thoſe drawn by ſhafts, with thoſe that are drawn by the yoke and bows, the ſuperiority of the pole to the ſhafts, and the advantage of making the cattle to draw by the yoke in preference to drawing by the forehead, become evident. When cattle draw by the ſhafts, ſays his lordſhip, the one before the other, it is impoſſible for the driver to know that each exerts an equal force, ſo as to contribute equally to the draught; but when they draw by the pole and yoke, the point of draught being in the middle of the yoke, when the beaſts draw equally, the yoke will ſtand ſquare with the pole, and the poſition of the yoke will always enable the driver to diſcover the defaulter, and to bring him to a proper exertion: it is, he ſays, this harmony of draught, and equality of exertion, that gives ſo great advantage to drawing by the yoke, that it is ſcarcely poſſible to ſay what weight of load two good large oxen can draw on a level road." The powers of cattle drawing by the forehead, on lord Shannon's eſtate, are recorded by Mr. Young and Mr. Billingſley:—an ox of the late Mr. Tatterſall, near Ely, drew four tons of wood on a level ſurface without apparent difficulty. What then, ſays he, "might not be expected from the equal exertion of two ſuch powerful animals, acting at the equal ends of the ſame yoke?" Notwithſtanding theſe judicious obſervations, further trials are wanting with reſpect to the beſt modes of draught.

*Hay Cart*, a cart made uſe of for conveying hay from the field; it is conſtructed in the ſame way as that made uſe of for corn. See *Corn Cart.*

*Quarry Cart*, is a ſtiff, ſtrong ſort of cart, employed in quarries. Carts for this purpoſe are variouſly conſtructed, according to the nature of the materials to be conveyed by them. When flat ſtones of great length and breadth are to be carted, they ſhould be low, for the convenience of loading and unloading, and at the ſame time very firmly put together.

It is ſtated in the Agricultural Survey of the County of Perth, that "Mr. Mylne, of Mylnfield, employs a cart of a particular conſtruction in his quarry of Kingoodie, which merits the attention of thoſe who have works of a ſimilar nature. This cart has a bend in the axle, which brings it within fourteen inches of the ground, although moving on wheels more than five feet high. The eaſe with which it is drawn, loaded, and unloaded, is ſuperior to the common cart, in the proportion of 7 to 3." It is ſeen at *fig.* 9. in *Plate* III. He alſo uſes in this quarry "a cart for carrying very large ſtones, ſuch as mill-ſtones, &c. which is drawn as eaſily upon wheels of two feet two inches in height as upon wheels of a greater diameter. In this cart the axle is only about five feet long, ſo that the wheels run under the body of the frame, which is flat, and may be made of any breadth or length required."

*Single horſe Cart*, that light ſort of cart in which only one horſe is employed. The term is made uſe of to diſtinguiſh them from thoſe of the large kind, in which three, four, or even a greater number of horſes are made uſe of. Carts of this ſmall conſtruction are extremely uſeful for all the various little purpoſes of cartage about the farm, as has been fully ſhewn above. See *figs.* 3. 7. and 8. in *Plate* III.

*Three wheel Cart*, a kind of cart that is conſtructed with three wheels, one being commonly placed in the middle, before, and generally of a ſmaller ſize. Carts of this ſort are moſtly cloſe, and uſed when great quantities of earth or other materials are to be conveyed at once to ſome diſtance.

CARTS, *laws relating to.* By 13 Geo. III. c. 78. no cart, having the ſole or bottom of the fellies of the wheels of the breadth of nine inches, ſhall be drawn with more than five horſes; and no cart, having the ſaid ſole the breadth of ſix inches, ſhall be drawn with more than four horſes; and thoſe of leſs breadth than ſix inches ſhall not be drawn with more than three horſes, under a penalty on the owner of 5l., and on the driver (not being the owner) of 10s. for every horſe above the ſtipulated number: the information to be laid within three days and the action commenced within one calendar month after the offence committed. Exceptions are admitted in favour of carriages, moving upon wheels or rollers of the breadth of 16 inches on each ſide, with flat ſurfaces, and ſuch as juſtices allow by licence to be drawn up ſteep hills, or on roads that are not turnpikes, or in deep ſnow or ice, or carrying any one ſtone, block of marble, cable rope, piece of metal, or ammunition and artillery for his majeſty's ſervice. Two oxen or horned cattle are conſidered in the contemplation of this act, as one horſe. Moreover it is enacted by 6 Geo. I. c. 6. that no perſon in London and Weſtminſter, or within

10 miles, ſhall carry at one load in carts or waggons having their wheels ſhod with iron, more than 12 ſacks of meal of five buſhels each, nor more than 12 quarters of malt, nor more than 750 bricks, nor more than one chaldron of coals, on pain of forfeiting any one of the horſes, with geers, bridles, &c. And by 18 Geo. II. c. 33. wheels of every cart, car, or dray, within the bills of mortality, ſhall be ſix inches broad in the felly, and not wrought about with iron, nor be drawn with more than three horſes, after they are up the hills from the waterſide, under a penalty of 40s.; but this act does not extend to any country cart or waggon, that ſhall bring any goods, or ſhall carry any goods half a mile beyond the paved ſtreets of the ſaid cities and places. Any perſon, within the ſaid limits, uſing any cart, car, or dray, having the wheels full ſix inches broad, when worn, may have the ſame bound round with tire of iron, provided it be ſix inches broad, and made flat, and not ſet on with roſe-headed nails. No perſon ſhall drive any cart, within the ſaid limits, unleſs the name of the owner, and number of ſuch cart, &c. be placed in ſome conſpicuous place of the cart, &c.; and his name be entered with the commiſſioners of hackney-coaches, under the penalty of 40s. and every perſon may ſeize and detain ſuch cart till the penalty be paid. On changing property, the names of the new owners are to be affixed, and to be entered with the commiſſioners of hackney-coaches, 30 Geo. II. c. 22. And ſtat. 24 Geo. III. ſt. 2. c. 27. compels the entry of all carts driven within five miles of Temple-bar. By 13 Geo. III. c. 78. §. 11. a perſon, who leaves any cart or other carriage, &c. in any high-way, beyond the reaſonable time allowed for loading or unloading, ſo as to obſtruct the paſſage of any other carriage, &c. ſhall forfeit 10s. By 1 Geo. ſtat. 2. c. 57, by 24 Geo. II. c. 43, and, more generally, by 13 Geo. III. c. 78, it is enacted, that if the driver of any cart, car, dray, or waggon, ſhall ride upon any ſuch carriage in any ſtreet or highway, not having ſome other perſon on foot or on horſeback to guide the ſame (ſuch carriages as are conducted by ſome perſon holding the reins of the horſe or horſes drawing the ſame excepted);—or if the driver of any carriage whatſoever, on any part of any ſtreet or highway, ſhall by negligence or wilful miſbehaviour cauſe any hurt or damage to any perſon or carriage paſſing or being upon ſuch ſtreet or highway;—or ſhall quit the highway and go on the other ſide of the hedge or fence incloſing the ſame; or wilfully be at ſuch diſtance from ſuch carriage, whilſt it ſhall be paſſing upon the highway, that he cannot have the direction and government of the horſes or cattle drawing the ſame: or ſhall, by negligence or wilful miſbehaviour, prevent, hinder, or interrupt the free paſſage of any other carriage, or of his majeſty's ſubjects, on the ſaid highways; or if the driver of any empty or unloaded waggon, cart, or other carriage ſhall refuſe or neglect to turn aſide and make way for any coach, chariot, chaiſe, loaded waggon, cart, or other loaded carriage; or if any perſon ſhall drive, or act as the driver, of any ſuch coach, poſt chaiſe, or other carriage let for hire, or waggon, wain, or cart not having the owner's name (as by this act is directed) painted thereon, or ſhall refuſe to diſcover the true chriſtian and ſurname of the owner of ſuch reſpective carriage; he ſhall on conviction by confeſſion, view of the juſtice, or oath of one witneſs, before one juſtice, forfeit any ſum not exceeding 10s., in caſe ſuch driver be not the owner of ſuch carriage; and if he be the owner, then any ſum not exceeding 20s.; and in default of payment be committed to the houſe of correction for any time not exceeding one month, unleſs the ſame be ſooner paid. And every ſuch driver offending in either of the ſaid caſes, may by authority of this act, with or without any warrant, be apprehended by any perſon who ſhall ſee ſuch offence committed, and ſhall be immediately conveyed or delivered to a conſtable or other peace officer, to be conveyed before a juſtice, to be dealt with according to law. And if any driver, in any of the caſes aforeſaid, ſhall refuſe to diſcover his name, the juſtice may commit him to the houſe of correction for any time not exceeding three months, or may proceed againſt him for the penalty by a deſcription of his perſon and the offence, and expreſſing in the proceedings that he refuſed to diſcover his name.

And for the better diſcovering of offenders, the owner of every waggon, wain, or cart, and alſo of every coach, poſt chaiſe, or other carriage, let to hire, ſhall cauſe to be painted, upon ſome conſpicuous part of his waggon, wain, or cart, and upon the pannels of the doors of all ſuch coaches, poſt chaiſes, or other carriages, before the ſame ſhall be uſed in any public highway, his chriſtian and ſurname and place of abode, in large legible letters; and continue the ſame thereupon ſo long as ſuch carriage ſhall be uſed upon any highway: and the owner of every common ſtage waggon or cart ſhall, over and above his chriſtian and ſurname, cauſe to be painted on the part and in the manner aforeſaid, the following words, *common ſtage waggon or cart*, as the caſe may be. And every perſon uſing any ſuch carriage as aforeſaid upon any highway, without the ſaid names and deſcriptions reſpectively, or cauſing to be painted thereon any fictitious name or place of abode, ſhall forfeit not exceeding 5l. nor leſs than 20s.

"Taxed carts," conſtructed, kept, and uſed under the regulations of the ſtat. 43 Geo. III. c. 99, are exempted from the annual duty of 5l. 5s. charged for carriages with leſs than four wheels and drawn by one horſe. Such carriages are thus deſcribed: they ſhall be built wholly of wood or iron, without any covering other than a tilted covering, and without any lining or ſprings, made of iron, wood, leather, or other materials, and with a fixed ſeat, without ſlings or braces, and without any ornament whatever, other than paint of a dark colour, for the preſervation of the wood or iron only, and which ſhall have the words "a taxed cart," and the owner's chriſtian and ſurname and place of abode, marked or painted on a black ground in white letters, or on a white ground in black letters, on the outſide of the back pannel or back part of ſuch carriage, in words at full length, and of a breadth in proportion, and the price of which (repairs excepted) ſhall not have exceeded, or the value thereof ſhall not at any time exceed the ſum of 12l. ſterling. For ſuch a carriage kept by any perſon for his own uſe, and not for hire, the annual duty to be paid is 1l. 4s. The exemption from all duties ſpecified in the foreſaid act extends to any cart kept to be uſed wholly in huſbandry, or in the carriage of goods in the courſe of trade, and whereon the name and reſidence of the owner, and the words "common ſtage cart" ſhall be legibly painted; although the owner, or his or her ſervant, ſhall occaſionally ride therein or thereon when laden, or when returning from any place to which, or when going to any place from which any load ſhall have been or ſhall be to be carried in ſuch carriage, or for conveying the owners thereof or their families to or from any place of divine worſhip on Sunday, or on Chriſtmas-day, or on Good Friday, or on any day, appointed for a public faſt or thankſgiving, or for carrying perſons going to or returning from the election of members to ſerve in parliament.

Cart, in *Artillery*. See Carriage.

Cart-*bote*, in our *Ancient Cuſtoms*, denotes wood to be employed in making or repairing inſtruments of huſbandry.

CART-*ladder*, a kind of rail or rack, placed occaſionally at the head, ſides, and tail of a cart to make it hold a larger quantity of hay, ſtraw, or other ſimilar bulky material. Rails of this ſort are framed and made very ſtrong.

CART-*lodge*, a ſmall out-houſe for ſheltering carts from the weather. Farmers ſhould be very careful to place their carts, &c. under proper ſhelter, when out of uſe, as they will laſt much longer by this means than if left expoſed in the yard to the effects of the weather; for, as they are thus ſometimes wet, and ſometimes dry, they ſoon rot, and become unfit for uſe. The duſt and naſtineſs ſhould alſo be conſtantly waſhed off before they are laid up in theſe places. Theſe ſheds ſhould always be as cloſe to the farm yards as poſſible, for the ſake of convenience.

CART-*rake*, a provincial term applied to the cart-track, or furrow made by the wheels of the cart.

CART-*rut*, the track made by the wheels: it is the ſame with cart-rake.

CART-*wright*, a name applied to a perſon whoſe buſineſs it is to make carts, waggons, &c. generally called a wheelwright.

CART-*water*, in *Geography*, a river of Scotland, which runs into the Clyde, 3 miles N. of Paiſley.

CARTA, *Ital.* literally means paper; but it is uſed in *Muſic* for a folio, a leaf, or page of muſical characters.

CARTA, in *Ancient Geography*, a town of Aſia, in Hircania, according to Strabo.

CARTAGO. See CARTHAGE.

CARTAGO *Nova*. See CARTHAGENA.

CARTAGO, in *Geography*. See CARTHAGO.

CARTAL, a town of European Turkey, in Beſſarabia, ſituate on the Danube; 28 miles W. of Iſmael.

CARTAMA, a town of Spain, in the province of Grenada, ſeated on an eminence; 4 leagues N.W. of Malaga.—Alſo, a town of Spain, in the province of Grenada, 6 leagues S.W. of Alhama.

CARTE, THOMAS, in *Biography*, a learned and laborious Engliſh hiſtorian, was the ſon of the Rev. Samuel Carte, vicar of Clifton upon Dunſmoor, in Warwickſhire, and born there, or at leaſt baptized there by immerſion, on the 23d of April, 1686. In 1698, ſoon after he had entered the 13th year of his age, he was matriculated in the univerſity of Oxford, and he was afterwards incorporated at Cambridge, where he took his degree of maſter of arts in 1706. Having entered into holy orders, he became reader of the abbey-church at Bath; and in conſequence of a ſermon, preached on the 30th of January 1713-14, and vindicating the character of king Charles I. from the aſperſions caſt on his memory with regard to the Iriſh rebellion, he was engaged in a controverſy with Mr. Chandler, a diſſenting miniſter at Bath and father of the celebrated Dr. Samuel Chandler. This controverſy occaſioned his firſt publication, entitled "The Iriſh Maſſacre, ſet in a clear Light, &c.;" which was afterwards inſerted in "Somers's Tracts." On the acceſſion of George I. he ſcrupled taking the oaths to the new government, and aſſumed a lay habit. In 1715 he was ſuſpected of being concerned in the rebellion, and in order to elude orders that were iſſued for apprehending him, he was for ſome time concealed in the houſe of a clergyman at Coleſhill. Whilſt he afterwards acted as ſecretary to biſhop Atterbury, he incurred ſuſpicion of being a party in the conſpiracy attributed to that prelate, and being charged with high-treaſon in 1722, a reward of 1000l. was offered for ſeizing his perſon. He fortunately eſcaped to France, and reſided in that country ſeveral years under the name of Philips. At this time he had acceſs to many perſons of learning and rank, and to ſeveral libraries, and thus had an opportunity of collecting materials for an intended Engliſh edition of the hiſtory of Thuanus. His collections were purchaſed by Dr. Mead, and employed in Buckley's ſplendid edition of that work, which appeared in 1733. By the intereſt of queen Caroline he obtained permiſſion to return to his own country, and ſoon after engaged in his important work, "The Hiſtory of the life of James duke of Ormonde" compriſed in 3 vols. fol. and publiſhed in 1735-36. This work contained uſeful materials with reſpect to the hiſtory of thoſe times, and particularly relating to the affairs of Ireland, of which Dr. Leland and other writers have availed themſelves; but as it diſplayed the author's attachment to arbitrary principles of government, it raiſed his reputation with the tory party. As he and thoſe with whom he was more immediately connected diſapproved the principles of Rapin's Hiſtory of England, and thought it chargeable with many errors, he announced his intention of writing a new hiſtory; and having, in 1738, printed an account of the materials as well as the encouragement that were neceſſary for the completion of his plan, he obtained ſubſcriptions, or reaſon to expect them, to the amount of 600l. per annum. Accordingly he commenced his reſearches in the libraries of Cambridge, reſided for ſome time in the houſe of Sir John Hinde Cotton, and employed himſelf in arranging his large collection of pamphlets and journals. In 1744, when the Habeas Corpus act was ſuſpended on account of apprehenſions from the Pretender, Carte was again ſuſpected, and being taken into cuſtody underwent an examination; but as no evidence appeared againſt him, he was ſoon diſcharged. Deriving from this circumſtance additional encouragement to proſecute his hiſtory, and a handſome ſubſcription from the city of London, voted by the common council, as well as from ſome of the London companies, he was enabled to complete the firſt volume in folio, terminating with the death of king John, towards the cloſe of the year 1747; but the introduction of an abſurd ſtory concerning a man who went from Somerſetſhire in 1716 to Avignon to be touched by the Pretender for the king's evil, and who was ſaid to have been cured, evinced his credulity and want of judgment to ſuch a degree, that his hiſtory ſunk into diſrepute, and the author was diſappointed with regard to ſeveral ſubſcriptions which he had reaſon to expect. However, he perſevered, and publiſhed two additional volumes in 1750 and 1752; and the fourth, which was poſthumous, appeared in 1755, and he continued the hiſtory to 1654. In this hiſtory, which in point of ſtyle is indifferently written, much uſeful information, procured by indefatigable reſearches, is blended with inveterate prejudice. Mr. Carte was the author of various other works, which are chiefly compilations, collections, and tranſlations. The moſt conſiderable is "A catalogue of Gaſcon, Norman, and French Rolls preſerved in the Tower of London," printed in French at Paris, in two vols. fol. 1743. He died at Caldecot houſe, near Abingdon in Berkſhire, on the 2d of April, 1754. His papers are depoſited in the Bodleian library; and they have been peruſed by the earl of Hardwicke, and alſo by Mr. Macpherſon, who availed himſelf of them in the compilation of his Hiſtory and State papers. Mr. Carte was a man of ſtrong conſtitution, indefatigable in his application to ſtudy, negligent with regard to his outward appearance, but when the labours of the day were cloſed, fond of ſociety, and in converſation chearful and entertaining. He left a widow, but no children. Nichols's Anecdotes of Bowyer. Biog. Brit.

CARTE, in *Fencing*, denotes a thruſt with a ſword at the inſide of the upper part of the body, with the nails of the ſword hand upwards. *Low carte* is a thruſt at the inſide of the lower half of the body; the poſition of the hand being the ſame as in the former.

Carte *Blanche*, a French term, ſeldom uſed but in this phraſe, To give, or ſend any one the *carte blanche*; i. e. to ſend him a blank paper, ſigned, for him to fill up with what conditions he pleaſes. Much like this is the French *blanc ſigne*, a paper without writing, except a ſignature at the bottom, given by contending parties to arbitrators, or common friends, to fill up with the conditions they judge reaſonable, in order to end the quarrel.

Carte *Blanche*, in *Military Language*, is an abſolute power or authority given by a ſovereign to a general of his army to do whatever may appear to him moſt proper or adviſable without waiting for order from his court; or it is permiſſion granted to a general to act in conformity to his own will, his knowledge, intelligence, and information, and according to circumſtances, without ſpecific orders from his chief. A general in conſequence of ſuch a power conferred on, and confidence repoſed in him, may attack his enemy in point both of time and manner as he thinks fit, without having either received a particular freſh order, or waiting for any.

In ancient times the general of an army had commonly the power of executing, with the troops under his command, his own plans and deſigns. The Grecian, Roman, and Carthaginian generals had almoſt always a carte blanche. But they were anſwerable to their reſpective governments for their want of ſucceſs, and they rarely eſcaped puniſhment as criminals when they were unſucceſsful. And even the excuſing of them from baniſhment was a favour, or indulgence, which was regarded as a mark of diſgrace or diſhonour. In modern times the republics of Venice and Geneva have particularly afforded examples of this ſeverity even towards generals who had gained many victories, and had rendered eſſential ſervice to thoſe ſtates; from which it may fairly be inferred, that the general who accepts a perfect carte blanche, is at leaſt imprudent, if he is not ambitious.

The Ottoman hiſtory alſo furniſhes ſeveral inſtances of generals ſtrangled on their return from campaigns for having been unſucceſsful, or defeated.

Seignior de Gordes, governor of Picardy, having engaged at Guinegale, without the orders of the court, the archduke Maximilian of Auſtria, Louis XI. was ſo vexed on being informed, that though his troops had at firſt the advantage in the action, they at laſt loſt it by betaking themſelves to pillage, that he determined his generals ſhould afterwards undertake nothing of conſequence without expreſs orders. Since the time of that prince, the kings of France, who have indeed been generally themſelves at the head of their armies, have not granted a carte blanche but very rarely, and only to generals whoſe valour and abilities have been frequently tried and acknowledged.

As moſt of our expeditions are carried on at a great diſtance from this country, it is perhaps more neceſſary for thoſe generals who command them to have a diſcretionary power of acting, than it is for thoſe of any other nation. But none ſhould be inveſted with ſuch authority, or entruſted with the command and management of ſuch diſtant expeditions but men of approved knowledge, diſcretion, and capacity. Had a general of talents been employed with a ſort of carte blanche at the beginning of the American war, commonly called the American rebellion, he would probably have ſettled it completely in the courſe of a few months.

The king being generaliſſimo of all his forces may grant a carte blanche to ſuch of his generals as he either knows, or ſuppoſes to poſſeſs great prudence and ſuperior talents. In like manner the general of an army may give a carte blanche to a general officer commanding a diviſion of the ſame. When a general poſſeſſes all the talents and qualifications neceſſary for his ſituation or employment, his ſovereign ought to confer on him this power or authority in order to prevent the want of it from retarding, embarraſſing, or crippling his operations. It is neceſſary indeed that every general ſhould have a diſcretionary power of acting to a certain degree. One of the great advantages, which a king capable of commanding his own armies enjoys, is that of doing what he chooſes, and when he chooſes, without loſing occaſions and opportunities of acting by waiting for orders. It is for the ſame reaſon uſeful and advantageous for a ſovereign to be preſent with his army, if he even have not the talents neceſſary for commanding it. For then orders are obtained promptly and expeditiouſly. Intrigue and jealouſy have not time to operate and produce their baneful effects: and the general has it more in his power to guard himſelf againſt them.

In engagements, the commander of an army ought to give only conciſe and general orders, leaving a ſort of carte blanche, or diſcretionary power of acting with all his generals as to matters of detail. For in every action there is almoſt an infinite number of circumſtances, which neither the commander himſelf nor the generals under him can foreſee, that require ſudden changes of diſpoſition and prompt movements, which every general ſhould have it in his power to direct, and cauſe to be made without waiting for orders.

Carte *geographique* of Argenville, in *Conchology*, the map cowry, Cypræa *mappa*.

Carte *geographique*, *Fauve*, in *Entomology*, the trivial French name of the European kind of butterfly, called by Linn. and Fabr. papilio prorſa.

CARTEIA, in *Ancient Geography*, *Rocadillo*, a town in the ſouthern part of Bœtica. Some difference of opinion has ſubſiſted about its preciſe ſituation; but the reſearches of ingenious geographers lead us to conclude, that it was ſeated at the bottom of the bay of Gibraltar, and that it was called "Tarteſſos" by the Greeks, though the Latins transferred this name to Gades. Some authors have confounded it with "Calpe," which was at the extremity of the mountain. Strabo ſays that it had been founded by Hercules, and that it had formerly been called "Heraclea." This city ſuffered much when Cæſar purſued the army of the ſon of Pompey, defeated at Munda. Carteia, it is ſaid, ſubſiſted till the arrival of the Moors; and the town, now called Caſtillon, is ſaid to be the remains of Carteia.

Carteia, a town of Spain, in Celtiberia, called by Polybius Althæa.

CARTEL, in *Military Language*, is a particular agreement, or convention between two belligerent powers, and has commonly for its objects the exchange or ranſom of priſoners, and the mutual delivering up of each others' deſerters at certain times, and under certain conditions.

There are alſo cartels agreed on or ſettled between princes in time of war, for carrying on commerce without interruption, notwithſtanding hoſtilities.

*Cartel* originally ſignified a *placard*, or manifeſto in writing, poſted in public places, for the purpoſe of notifying, or announcing its contents.

It comes from the Italian word *cartello*, or the Latin word *cartellus*, both of which have the ſame ſignification, being diminutives of *charta*, ſignifying *paper*.

The term *cartel* has alſo been made uſe of to denote the agreement or convention which contained the rules or regulations, that were to be obſerved by the knights, or chevaliers who jouſted and combated at a tournament, or carrouſal.

This name is likewiſe given to the billet, or note of challenge which the perſon offended or inſulted ſends to the aggreſſor, deſiring him to meet him at the place and time appointed to give him ſatisfaction, and ſettle their quarrel by ſingle combat.

This term has alſo been often employed to ſignify a letter of defiance, or challenge to ſingle combat. Such letters were in frequent uſe, when under the feudal ſyſtem combats of this nature were not only practiſed, but were ſanctioned and enjoined by princes, and even by biſhops and the dignified clergy as the beſt method of ſettling difficult points of law and controverſies that could not eaſily be otherwiſe determined. Such challenges, or letters of defiance, were not always confined to ſingle combats. They ſometimes extended to ſmall bodies of men of an equal number on each ſide, and ſometimes even to armies. Rymer gives the cartel which Edward III. ſent to Philip de Valois challenging him to fight him within ten days before the gates of Tournay, either body to body, or one hundred men to a hundred men, or army to army.

Challenges of this nature, however, took place long before the exiſtence of the feudal ſyſtem, and as far back indeed as either hiſtory or poetry carries us. For inſtances of them are to be found in Homer, Virgil, and other Greek and Latin poets, as well as in their hiſtorians.

*Cartel* is alſo a term uſed to denote a ſhip commiſſioned in time of war for exchanging the priſoners of any two belligerent powers, or for carrying a requeſt or propoſal from one to the other. The officer who commands her is permitted to carry a ſingle gun only for the purpoſe of firing ſignals.

*Cartel* likewiſe denotes a meaſure of capacity for corn in divers parts of France, varying in different places.

CARTENAGA, in *Ancient Geography*, a town of India, placed by Ptolemy on this ſide of the Ganges.

CARTENNA, or Cartennæ, a very conſiderable city of Africa, in Mauritania Cæſarienſis, or the weſtern province of the kingdom of Algiers, called Tlemſan, or Tremecen, ſituated near the mouth of the river Cartennus, to the north-eaſt, and S.S.W. of that of the river Chinalaph, or Shelliff. Pliny and Ptolemy mention it. It was a Roman colony, and Auguſtus ſettled in this place the ſoldiers of the ſecond legion. Its ſituation correſponds to that of Muſty-gannim, or Moſtagan, and alſo of Maſagran. The ſtrength and beauty, ſays Dr. Shaw, (Travels, p. 16.) of the walls of Muſty-gannim to the N.W. may well allow us to ſuppoſe them to have been formerly a portion of ſome Roman fabrick. For both Muſty-gannim and Maſagran are ſo copiouſly ſupplied with water; they are ſo commodiouſly ſituated with regard to the fertile and extenſive lawns that are ſpread far and near behind them; they enjoy, beſides, ſuch a delightful proſpect of the ſea, and of the rich maritime country that lies in view, to a great diſtance, on each ſide, that, without doubt, they were ſtations too valuable to have been neglected by the Romans. Pliny and Ptolemy place their Cartenna in this direction; and in the Itinerary we have the ſame diſtance betwixt Arſenaria and Cartenna that is found betwixt Arzew and theſe places. One or other of them, or both, might have formerly made up this colony: for, conſidering that their ſituations are nearly contiguous, and that the interjacent plantations belong indifferently, as perpaps they always did, to both of them, there is ſome probability at leaſt that they had likewiſe the ſame intereſt, and were accordingly one and the ſame community, under the name Cartennæ, as it is written in the plural by Ptolemy. See Mostagan.

CARTENNUS, a river of Africa, which diſcharges itſelf into a gulf of the Mediterranean Sea, N.E. of the port of Arſinaria. It is now, as Dr. Shaw ſuggeſts, the *Halrah*, which ſee.

CARTER, in *Geography*, a new county in the ſtate of Tenneſſee, in North America, formed of a part of the county of Waſhington.

CARTERET, John, earl Granville, in *Biography*, an eminent ſtateſman, was born in 1690, and educated at Weſtminſter ſchool and Chriſtchurch college, Oxford, from which ſeats of learning he derived a great degree of claſſical knowledge, and alſo high principles of government, and a fondneſs for convivial pleaſures, which marked the progreſs of his life. Upon being introduced into the Houſe of Peers, in 1711, he diſtinguiſhed himſelf as a zealous advocate for the Hanover ſucceſſion, and was ſucceſſively advanced by king George I. to ſeveral poſts of honour. As a forcible and eloquent ſpeaker, he ſtrenuouſly ſupported the meaſures of adminiſtration during that reign. In 1719 he was deputed as ambaſſador extraordinary and plenipotentiary to the queen of Sweden, and negociated the peace between that crown and Denmark, which terminated the troubles of the north of Europe; and in 1721 he was appointed ſecretary of ſtate, which gave him an opportunity of vigorouſly defending the boldeſt meaſures of the exiſting adminiſtration. Having accompanied the king to Hanover in 1723, he was, on his return, in the following year, appointed lord lieutenant of Ireland, and exerted himſelf in compoſing the diſturbances in that country, which had been fomented by Swift's famous Drapier's letters. When Swift expoſtulated with him for his proſecution of the printer of thoſe letters, he replied in a line of Virgil, no leſs appropriate as an apology for many meaſures of that reign, "Regni novitas me talia cogit moliri," i. e. The unconfirmed ſtate of the throne compels me to make uſe of theſe means. After his return to England, in 1726, he continued his firm ſupport to the government. After the acceſſion of George II., in 1727, he again occupied the vice-royalty of Ireland, and conducted the affairs of government till the year 1730, in a manner that conciliated contending parties. On this occaſion, Swift wrote an humorous vindication of his lordſhip from the charge of favouring none but tories, high church-men, and jacobites. After his return to England, he joined the oppoſition to ſir Robert Walpole, and in the parliamentary conteſt with his miniſtry, adopted maxims and language very different from thoſe which he had avowed and uſed, whilſt he himſelf was a member of adminiſtration. Having at length ſucceeded, in connection with his coadjutors, in procuring the diſmiſſion of Walpole in 1742, he became ſecretary of ſtate, and ſupported meaſures ſimilar to thoſe which he had been lately cenſuring. In 1744, upon the death of his mother, he ſucceeded to the titles of viſcount Carteret and earl Granville. After a courſe of various political changes, he cloſed his life the 2d of January, 1763, in the 73d year of his age. Although he poſſeſſed diſtinguiſhed talents and acquirements, his temper was ſo ardent and overbearing, that he was fitter for being the miniſter of an abſolute monarch than of a limited ſovereign. Ambitious, and fond of ſway, he was neither mercenary nor vindictive; and the elevation and fertility of his genius were equalled by his confidence and preſumption; ſo that he is ſaid never to have doubted. Learned himſelf and an encourager of literature, he particularly patronized Dr. Taylor, the celebrated Grecian, and Dr. Bentley. In ſocial life he was pleaſant, good-humoured, frank, and bacchanalian. Biog. Brit.

Carteret, in *Geography*, an iſland in the Southern Pacific Ocean, diſcovered by captain Carteret in Auguſt 1767. S. lat. 8° 26′. E. long. 154° 14′.

Carteret, a maritime county of Newbern diſtrict, in the ſtate of North Carolina, in North America, on Core and Pamlico ſounds. It contains 3732 inhabitants, including 713 ſlaves. Its chief town is Beaufort.

Carteret *Harbour*, a bay on the ſouth-eaſt coaſt of New Ireland. S. lat. 4° 48′ 40″. E. long. 152° 45′ 40″. This harbour forms a ſort of baſin, where the clouds, loaded with water, after paſſing over the high mountains of New Ireland, experience a calm, which prevents the air from ſupporting them. To this circumſtance are owing thoſe exceſſive rains, which render the anchoring-place far from deſirable to navigators. Nevertheleſs, this harbour furniſhes plenty of good water, which may be procured with great facility: but the wood obtained in this place introduces into the ſhips a prodigious number of ſcorpions and ſcolopendræ, of the ſpecies called "ſcolopendra morſitans," which are very troubleſome. This harbour affords no refreſhments. The tides take place once a day, and riſe only about ſix feet. The thermometer, obſerved at noon in the middle of July, varied from 19° to 21°; and the barometer from 28 inches $1\frac{7}{10}$th line to 28 inches $1\frac{2}{10}$th line. Voyage in ſearch of La Perouſe, vol. i.

Carteret *Point*, the N.W. extremity of the iſland of Egmont, in New Guernſey. S. lat. 10° 42′. E. long. 163° 50′.

CARTERIA, in *Ancient Geography*, an iſland of Aſia Minor, near Smyrna, according to Pliny.

CARTEROMACO, or Carteromachus, Scipio, in *Biography*, a learned Italian, whoſe proper name was *Fortiguerra*, was born at Piſtoia in 1467; and having ſtudied in his native city at a college founded by his family, at Rome, and at Florence, where he learned Greek under Angelo Poliziano, and having paſſed ſome years at Padua, he was appointed by the republic of Venice, in 1500, with a liberal ſalary, to teach the Greek language to the Venetian youth. Upon an invitation to Rome by pope Julius II. he was placed by this pontiff with his nephew, cardinal Galeotti de la Rovere; and upon the death of this cardinal, he attached himſelf to cardinal Francis Alidoſio, who was killed at Ravenna in 1511. His next patron was cardinal John de Medici, afterwards pope Leo X.; but his riſing expectations were ſuddenly fruſtrated by death, at the age of 46, in 1513. Scipio was equally diſtinguiſhed for modeſty and learning; and both theſe qualities are aſcribed to him in a very eminent degree by Eraſmus (Epiſt. 471.), who conſulted him and Marcus Muſurus upon ſuch difficulties as occurred to him in the explication of Greek proverbs. His principal works are, "A Latin Oration in praiſe of Greek learning," Venice, 1504; "A Latin Tranſlation of the Greek Oration of Ariſtides in praiſe of the City of Rome," Venice, 1518; "An Edition of Ptolemy's Geography," Rome, 1507; and various prefaces, epigrams, and letters in Greek and Latin, inſerted in other publications. Gen. Dict. Tiraboſchi.

CARTERON, or Carterum, in *Ancient Geography*, a town of Aſiatic Sarmatia, ſituated on the coaſt of the Euxine ſea, according to Ptolemy.

CARTES, Renè Des, in *Biography*, an eminent philoſopher, and founder of a numerous ſect, called *Carteſians*, was a native of France, the deſcendant of an ancient and noble family, and born at La Haye in Touraine, on the 31ſt of March in 1596. As he diſcovered in his infancy an eager curioſity to inquire into the nature and cauſes of things, his father called him "the Philoſopher," and placed him, at the early age of 8 years, under the tuition of a relation in the Jeſuits' college at La Fleche, where he made an uncommon proficiency in the learned languages and polite literature, and formed an intimate acquaintance with ſeveral perſons, who afterwards became eminent in the republic of letters, particularly with Merſenne. After ſpending 5 years in the diligent ſtudy of languages, and in reading the ancient poets, orators, and hiſtorians, he directed his attention to mathematics, logic, and morals; but diſapproving the mode in which theſe ſciences, and more eſpecially the two latter, had been uſually taught, he formed a plan of ſtudy for himſelf, and ſketched out a conciſe ſyſtem of rules or canons of reaſoning, in which he followed the ſtrict method of the geometricians. Diſſatisfied, however, with the courſe of ſtudy which he was purſuing, he left the college at the cloſe of 8 years, and returned to his parent, lamenting that he had derived no other benefit from his paſt application than a fuller conviction that he had hitherto known nothing with perfect clearneſs and certainty. He therefore determined to throw aſide his books, and to ſeek knowledge in the ſtudy of himſelf and of the great volume of nature. Having ſpent ſome time in the city of Rennes, where he employed himſelf in learning to ride and fence, and other exerciſes preparatory to a military life, he propoſed to devote himſelf to the profeſſion of a ſoldier; but his conſtitution being feeble and unfit for the fatigues of this kind of life, his father ſent him to Paris in 1613, and confiding in his diſcretion, left him to his own uncontrolled direction. Here the love of pleaſure and a propenſity to gaming would probably have wholly diverted his attention from the purſuits of literature, if he had not fortunately renewed his acquaintance with Merſenne, and other learned perſons, who reclaimed him from the frivolity and folly to which his time was devoted, and engaged him to renew his application to the ſtudy of mathematics, which he proſecuted in retirement for the ſpace of about 2 years. But ſtill unſteady in his purpoſe, and diſſatisfied with the reſult of his ſpeculations, he again laid aſide his books, and determined to embark in the military profeſſion, under a notion that he ſhould thus enjoy favourable opportunities for gaining a knowledge of the world. Accordingly he departed for Holland in 1616, and entered himſelf as a volunteer in the Dutch army. Whilſt he regularly performed his military duty, he ſpent his intervals of leiſure in ſtudy; and during the encampment of the army at Breda, he ſolved a problem in mathematics to the ſatisfaction of Beekman, an eminent mathematician, principal of the college of Dort, and he alſo wrote a treatiſe on muſic, which was printed at Utrecht in 1650, 4to., and at Amſterdam in 1656, 4to., under the title of "Compendium Muſicæ," of which an Engliſh tranſlation was publiſhed at London in 1653. During his ſtay at Breda, he alſo laid the foundation of ſeveral of his works, and is ſaid to have compoſed a philoſophical diſſertation, in which he attempted to prove that brutes are automata, or mere machines. See Brutes. In 1619 he quitted the Dutch ſervice, and entered as a volunteer in the army of the duke of Bavaria. Whilſt he remained in winter-quarters, he had many intervals of ſolitary leiſure, which he employed in a courſe of meditation upon important ſubjects; and as he was ſtill perplexed with doubts and difficulties, he had recourſe for ſatisfaction to the Roſicrucians, who boaſted of divine inſpiration; but failing to find any one who could unfold to him the myſteries of this ſect, he returned from his ſhort excurſion into the regions of enthuſiaſm to the humble path of rational inquiry, and preferring the ſociety of learned men to that of his military comrades, he appeared more like a philoſopher than a ſoldier. Having been preſent at ſeveral ſieges, and having, in 1621, made the campaign in Hungary, under the count de Bucquoy, who was killed that year, he abandoned the military profeſſion ; and after a tour through the northern parts of Germany, he returned, in 1622, to his own country, with no other profit from his travels, as he himſelf confeſſes, than that they had freed him from many prejudices, and rendered his mind more fit for the reception of truth. Some time after he fixed his reſidence at Paris, where he cleared himſelf from the imputation of being a Roſicrucian, and applied to the ſtudy of mathematics, with a view of diſcovering general principles of relation, meaſure, and proportion, applicable to all ſubjects, by means of which truth might be inveſtigated with certainty, and the boundaries of knowledge enlarged. But not ſucceeding to his wiſhes, he turned his attention to ethical inquiries, and attempted to raiſe a ſuperſtructure of morals on the foundation of natural ſcience ; being of opinion, that the beſt means of diſcovering the true principles and rules of action, is the contemplation of our own nature, and the nature of the world around us. This inveſtigation in courſe of time produced his treatiſe " On the Paſſions," or " Traité des Paſſions de l'Ame," written in 1646 for the uſe of the princeſs Elizabeth of Bohemia, and printed ſeveral times in 12mo. viz. in 1650 at Amſterdam, in 1651 at Rouen, and in 1664 and 1679 at Paris. A Latin tranſlation of it was publiſhed at Amſterdam in 1656 and 1664 in 4to. From the phyſical nature of the paſſions he deduces his principles of morals ; and his doctrine on this ſubject is as follows : " Whatever happens, is called paſſion, with reſpect to the ſubject to which it happens ; and action, with reſpect to that which cauſes it to happen. Nothing acts upon the mind more immediately, than the body to which it is joined ; whence what is paſſion in the mind, is action in the body. Heat, and the motion of the limbs, proceed from the body, and thoughts from the mind ; but the mind cannot give motion and heat to the body. The more vivid and ſubtle parts of the blood, which heat rarifies in the heart, are inceſſantly entering into the cavities of the brain, and form animal ſpirits, which are in the brain ſeparated from other leſs ſubtle parts of the blood. Theſe animal ſpirits, which are corporeal, excited as by the ſoul itſelf, ſo alſo by the action of external objects upon the ſenſes, are the immediate cauſe of all the original motions of the body. Whence all the limbs may be moved by means of the objects of ſenſe, and the animal ſpirits, without any action of the ſoul. Nothing is to be attributed to the ſoul but thoughts : and theſe are of two kinds ; active, or volition, including deſire and averſion ; and paſſive, including intelligence, perception, and feeling, or paſſion.

" The ſoul is united to all the parts of the body, but its chief functions are exerciſed in the pineal gland of the brain, where it receives notice of the impreſſions made upon the ſenſes, and whence it ſends forth animal ſpirits through the nerves, which put the muſcles into motion. The paſſions are feelings of the ſoul, produced and continued by the action of the animal ſpirits ; the chief effect of the paſſions is, to excite the ſoul to volition. All volition is in its nature free, and conſiſts in cauſing the gland, with which it is intimately connected, to move in that manner which is moſt ſuitable to produce an effect correſponding to the volition. Judgment comprehends not only the perception of the underſtanding, but the aſſent of the will, and it is from the abuſe of its natural liberty of aſſenting or not aſſenting to a propoſition that error ſprings. The ſoul, in the act of recollection, exerciſes a volition by means of which the pineal gland inclines itſelf ſucceſſively this way and that way, and impels the animal ſpirits to different parts of the brain, till that part is found upon which the object which we wiſh to recollect has left traces.

" The ſoul of man, which is one, is both ſenſitive and rational ; and the conflict between its inferior and ſuperior parts is nothing elſe but a ſtruggle between the motions which the body, by means of its animal ſpirits, and the ſoul, by its own volition, are at the ſame time endeavouring to excite in the pineal gland. By the reſult of this conteſt, every one may judge of the ſtrength or weakneſs of his ſoul. The ſoul acquires the dominion over the body by means of firm and clear deciſions concerning good and evil, produced by the contemplation of truth, which it determines to follow without ſuffering itſelf to be ſeduced by preſent paſſion. The paſſions belong to the body, and are to be imputed to the ſoul only as it is united to the body. Their uſe is, to excite the mind to exert thoſe volitions which are neceſſary to the preſervation or perfection of the body, and the attainment of that which is in its nature good. All the paſſions are uſeful, and only become injurious by exceſs. The general remedy againſt the exceſs of the paſſions is, to conſider all the appearances which they preſent to the imagination as deceitful, and to poſtpone volition and action till the commotion which they have excited in the blood is appeaſed, or where immediate action is neceſſary, to follow reaſon in oppoſition to paſſion. Since nothing beyond our own thoughts is abſolutely in our own power, it is wiſer to endeavour to ſubdue ourſelves than fortune, and to change our own deſires than the order of the world."

But to return from this digreſſion. Des Cartes having been employed for ſome time in the ſtudies above recited, he left Paris, and took a journey to Italy, where he ſpent about 2 years, converſing with eminent mathematicians and philoſophers, and informing himſelf concerning various objects in natural hiſtory. After his return to Paris, he found his ſtudies ſo much interrupted, and his mind remained in ſo ſceptical a ſtate, that he was unable to purſue any regular plan of life ; and, therefore, in 1629, he determined to withdraw to ſome more retired ſituation, where, without the intruſion of viſitors, he might have leiſure to complete his grand deſign of forming a new ſyſtem of philoſophy. In order to prevent any interference on the part of his friends from diverting him from the execution of his purpoſe, he left Paris without communicating his intention to any ; and none, except his friend Merſenne, knew for ſome time the place of his retirement. Having tranſiently viſited ſeveral towns of Holland, he at laſt fixed upon Egmond, a pleaſant village near Franeker in Frieſland, as the place of his ſtated reſidence. Here he proſecuted his philoſophical labours, and enjoyed the ſatisfaction of obſerving how much they engaged the attention of the learned world. In this ſtate of retirement, he employed himſelf in inveſtigating a proof from reaſon, independent of revelation, of the fundamental points of religion, viz. the exiſtence of God, and the immortality of the ſoul, and alſo in other important metaphyſical ſpeculations. The reſult of theſe ſpeculations afterwards appeared in his treatiſe entitled " Meditationes de primâ Philoſophiâ, &c." and printed at Paris in 1641, 8vo. ; a ſecond edition was printed at Amſterdam, in 1642, 12mo. Another edition was publiſhed at Amſterdam, in 1719, 8vo. A French tranſlation was printed at Paris, in 1647, 4to. ; a ſecond edition appeared at Paris in 1661, 4to. ; but the beſt is the third edition, divided into articles, with ſummaries, by R. F. i. e. René Fedé, doctor of phyſic of the faculty of Angers, and printed at Paris in 1673, 4to. Whilſt Des Cartes remained in Frieſland, he purſued the phyſical inquiries which he had begun in France ; and theſe reſearches gave occaſion to his " Diſcourſe on Meteors," which he publiſhed ſome years after. After his removal to Amſterdam, he directed his ſedulous attention to medicine, anatomy, and chemiſtry ;

and he ſpent a whole winter in diſſecting animal bodies, and in chemical operations. About the year 1630 or 1631, he made a ſhort tour to England; and in the neighbourhood of London he employed himſelf in obſervations on the variation of the compaſs. In the ſpring of the year 1633 he removed to Deventer, where he completed ſeveral works which were left unfiniſhed, and reſuming his ſtudies in aſtronomy, in the ſummer following he finiſhed his "Treatiſe of the World," which contained an abridgment of his natural philoſophy; but when he heard in what manner Galileo had been treated by the court of inquiſition, he was deterred from publiſhing it, and concealed his opinion concerning the true ſyſtem of the world. An abridgment of this treatiſe was publiſhed at Paris in 1664, 8vo. under the title of "Le Monde des Cartes, &c." and a correct edition of it in 1677, 4to. at the end of Des Cartes's "Traité de l'Homme." It is printed in Latin in his "Opera Poſthuma." The tenets of Des Cartes made their firſt appearance in the ſchools at Deventer in 1633, where they were introduced by the profeſſor of philoſophy, Henry Rener, a learned man, and an intimate friend of Gaſſendi. In the following year he returned to Amſterdam, and ſoon after took a journey into Denmark, and the lower parts of Germany. In 1635 he went to Leewarden in Frieſland, where he remained till the year 1637, and wrote his "Treatiſe of Mechanics," publiſhed in Latin in his "Opera Poſthuma." In the ſame year he publiſhed his four treatiſes concerning "Method," "Dioptrics," "Meteors," and "Geometry." Theſe were printed in French at Leyden in 4to. and publiſhed at firſt without his name. The three firſt were tranſlated ſome years after into Latin by Curcellæus, which tranſlation was reviſed by Des Cartes; and they were publiſhed under this title, "Renati Des Cartes Specimina Philoſophiæ, &c." Amſt. 1644, 4to. and 1656, 4to. Van Schooten, profeſſor of mathematics at Leyden, afterwards tranſlated his "Geometry" into Latin, adding his own commentaries and the notes of Monſ. de Beaune. This tranſlation, entitled "Renati Des Cartes Geometria, &c." was publiſhed at Leyden in 1649, 4to. and with the "Compendium Muſicæ" at Frankfort on the Mayne in 1695, 4to.

In his treatiſe of "Method," Des Cartes lays down the following rules for the diſcovery of truth, which are derived from the practice of geometricians. Nothing is ever to be admitted as true, which is not certainly and evidently known to be ſo; that is, in judging of truth all prejudice and precipitancy are carefully to be avoided, and nothing more is to be admitted in the concluſion, than what appears to the underſtanding ſo diſtinctly and clearly, that it cannot poſſibly be doubted. Difficulties muſt be accurately examined, and divided into ſo many parts, as may be moſt convenient for their eaſy ſolution. In proving any truth, the ideas are always to be brought forward in a certain order, beginning from things the moſt ſimple and moſt eaſily known, and advancing, by regular ſteps, to thoſe which are more complex and difficult. All the parts of a demonſtration ſhould be ſo diſtinctly numbered, that the relation of each to the whole may be clearly ſeen, and that it may be certainly known that nothing is omitted.

When the ſpecimen of his philoſophy in the above-mentioned four treatiſes appeared, the number of his followers and admirers increaſed; and his new doctrine had alſo many opponents. At Utrecht, Leyden, and Amſterdam, and in other Dutch ſchools, the Carteſian doctrines were zealouſly eſpouſed by many learned men; while ſeveral theologians, alarmed at the idea of innovation, ſtrenuouſly oppoſed them, and even attempted to ſubject their author to the cenſure of the civil magiſtrate. In Great Britain, the Carteſian doctrine gained ſuch a degree of credit, that ſir Charles Cavendiſh, brother to the earl of Newcaſtle, invited Des Cartes to ſettle in England; nor did he appear diſinclined to accept the invitation, when he was aſſured that the king was a Catholic in his heart. Charles I. indeed gave him reaſon to expect a liberal appointment; but the civil war fruſtrated this deſign, and Des Cartes remained in Holland. In his native country his doctrine was at firſt well received; but a ſtrong party among the Jeſuits combined againſt it; and a violent conteſt was long kept up between the Jeſuits and the Carteſians. In the courſe of theſe diſputes, Des Cartes himſelf appeared earneſtly deſirous of becoming the father of a ſect, and diſcovered more jealouſy and ambition than became a philoſopher.

In 1641, Des Cartes was invited to France by Lewis XIII. upon very honourable conditions; but no propoſal could induce him to quit his retirement. It appears, however, that, during his reſidence in Holland, he made three viſits to his native country, viz. in 1643, 1647, and 1648, and that he was amuſed with the promiſe of an annual penſion of 3000 livres, which he never received. Having, in 1641, publiſhed his "Meditations," which occaſioned a controverſy with Voet, rector of the univerſity of Utrecht, he afterwards viſited France, where he found the edition of his "Principles," and the Latin tranſlation of his eſſays finiſhed, and the copies ſent from Holland. His "Principles" were dedicated to his illuſtrious diſciple, Elizabeth, princeſs palatine daughter of prince Frederic V. elector palatine, and king of Bohemia. The edition of his "Principles" was printed at Amſterdam, by Elzevir, in 1644, 4to. under the title of "Principia Philoſophiæ;" and a French tranſlation, by the abbé Picot, reviſed by himſelf, was publiſhed at Paris in 1647, 1651, 1658, 4to. An Engliſh tranſlation, with remarks, was printed at London in 1653, 4to. This work is divided into four parts; the *firſt* contains the principles of human knowledge; the *ſecond* treats of the laws of nature, the principles of natural things, the properties of bodies, ſpace, motion, &c.; the *third* contains a particular explication of the ſyſtem of the world, and more eſpecially of the heavens and celeſtial bodies; and the *fourth* treats of the earth. In 1645, Des Cartes applied again to anatomy, though he was ſomewhat diverted from this ſtudy by the problem concerning the quadrature of the circle, which was then agitated, and which he declared impoſſible to be ſolved. During the winter of this year he compoſed a ſmall tract againſt Gaſſendi's "Inſtitutes," and another "On the Nature of the Paſſions." About the ſame time he had a diſpute with Roberval concerning vibrations, and he carried on a correſpondence with the princeſs Elizabeth upon moral philoſophy. In the year 1647, he was appealed to as an umpire in a diſpute between Chriſtina, queen of Sweden, and M. Chanut, the French reſident in that kingdom. The queſtion in debate was this: "When a man carries love or hatred to exceſs, which of theſe two irregularities is the worſt?" On this occaſion he drew up the Diſſertation upon Love, that is publiſhed in the firſt volume of his letters, which proved highly ſatisfactory to the queen; though ſhe objected to one paſſage, which ſeemed to intimate that the world was not finite. This learned princeſs, having, by M. Chanut, deſired his opinion of the ſovereign good, was ſo much pleaſed with his anſwer and with his treatiſe on the paſſions, which he ſent her, that ſhe expreſſed a wiſh to be inſtructed by him in the principles of his philoſophy, and invited him to Sweden. Des Cartes, notwithſtanding the apprehended injury that might attend the ſeverity of the climate, accepted the invitation, and arrived at Stockholm in October, 1648. The queen received him with reſpect, engaged him to give her inſtruction every morning at 5 o'clock, and deſired him to reviſe and digeſt all his unpubliſhed writings, and to draw up from them a complete body of philoſophy. The moſt conſiderable of them were publiſhed after his death. The French edition of his works, publiſhed at Paris, comprehends 15 volumes in 12mo. and their contents are as follow; viz. "Lettres de M. Des Cartes, ou l'on a joint le Latin de pluſieurs lettres, qui n'avoient été imprimeés qu'en François, avec une traduction François de celles, qui n'avoient juſqu'a preſent paru qu'en Latin," 1724, 6 volumes. "Les Meditations metaphyſiques touchant la premiere philoſophie," 1724, 2 vols. "Diſcours de la Methôde, pour bien conduire ſa raiſon, et chercher la verité dans les ſciences. Plus la dioptrique, les meteores, la mechanique, et la muſique," 1724, 2 vols. "Les Principes de la Philoſophie," 1724, 1 volume. "Les Paſſions de l'Ame. Le Monde, ou traité de la lumiere. Edition augmentée d'un diſcours ſur le mouvement local et ſur la fievre, ſur les principes du même auteur," 1728, 1 volume. "L'Homme de René Des Cartes, et la formation du fœtus; avec les remarques de Louïs de la Forge," 1722, 1 volume.

Queen Chriſtina earneſtly ſolicited this eminent philoſopher to remain in her kingdom, and to aſſiſt her in eſtabliſhing an academy of ſciences; and with this view propoſed to allow him a revenue of 3000 crowns a year, with an eſtate which ſhould deſcend to his heirs and aſſigns for ever. But Des Cartes had not been more than four months in Sweden, when a cold, which he caught in his early viſits to the queen, brought on an inflammation of the lungs, which ſoon terminated his life, on the 11th of February, 1650, in the 54th year of his age. The queen is ſaid to have lamented his death with tears. His remains were interred, at the requeſt of the French ambaſſador, in the cemetery for foreigners, and a long hiſtorical eulogium inſcribed on his tomb. Seventeen years afterwards his bones were carried from Sweden to France, and interred with great pomp in the church of St. Genevieve du Mont, where a magnificent monument, with his buſt in baſſo-relievo, and an appropriate inſcription, is erected to his memory.

Des Cartes, as his various writings amply teſtify, poſſeſſed an accurate and penetrating judgment, a fertile invention, and a mind ſuperior to prejudice; qualities which, united with an early acquaintance with ancient learning, and indefatigable induſtry in the inveſtigation of truth, might ſeem to promiſe no inconſiderable ſhare of ſucceſs in the great deſign of reforming and improving philoſophy. He would have been more ſucceſsful if he had been leſs deſirous of applying mathematical principles and reaſonings to ſubjects which do not admit of them; if he had ſet leſs value upon mere conjectures; and if he had been leſs ambitious of the honour of founding a new ſect in philoſophy. See the next article. We ſhall here ſubjoin ſome additional teſtimonies to his character. M. Baillet, in his account of his life, &c. highly commends him for his contempt of wealth and fame, his love of truth, his modeſty, diſintereſtedneſs, moderation, piety, and ſubmiſſion to the authority of the church. Dr. Barrow, in his "Opuſcula," tells us, that he was undoubtedly a very good and ingenious man, and a real philoſopher, and one who ſeems to have brought thoſe aſſiſtances to that part of philoſophy which relates to matter and motion, which, perhaps, no other had done; that is, a great ſkill in mathematics, a mind habituated both by nature and cuſtom to profound meditation, a judgment exempt from all prejudices and popular errors, and furniſhed with a conſiderable number of certain and ſelect experiments, a great deal of leiſure, entirely diſengaged by his own choice from the reading of uſeleſs books, and the avocations of life, with an incomparable acuteneſs of wit, and an excellent talent of thinking clearly and diſtinctly, and expreſſing his thoughts with the utmoſt perſpicuity. Dr. Halley (ſee Wotton's Reflections upon Ancient and Modern Learning), ſays, "as to Dioptrics, though ſome of the ancients mention refraction, as a natural effect of tranſparent media; yet Des Cartes was the firſt who, in this age, has diſcovered the laws of refraction, and brought dioptrics into a ſcience." Wotton (ubi ſupra), though he degrades him in compariſon with lord Bacon, whom he ſoon ſucceeded, and cenſures him for too precipitately drawing concluſions without a ſufficient number of previous experiments, obſerves nevertheleſs, that "to a vaſt genius he joined an exquiſite ſkill in geometry, ſo that he wrought upon intelligible principles in an intelligible manner, though he very often failed in one part of his end, namely, a right explication of the phenomena of nature; yet, by marrying geometry and phyſics together, he put the world in hopes of a maſculine offspring in proceſs of time, though the firſt productions ſhould prove abortive." Dr. Keil, in the introduction to his "Examination of Burnet's Theory of the Earth," animadverting on Wotton's reflections, &c. tells us, that Des Cartes was ſo far from applying geometry and obſervations to natural philoſophy, that his whole ſyſtem is but one continued blunder on account of his negligence in that point; which he could eaſily prove by ſhewing, that his theory of the vortices, upon which the whole ſyſtem is grounded, is abſolutely falſe; and that ſir Iſaac Newton has ſhewn, that the periodical times of all bodies, which ſwim in a vortex, muſt be directly as the ſquares of their diſtances from the centre of the vortex. But it is evident, from obſervations, that the planets, in turning round the ſun, obſerve quite another law; for the ſquares of their periodical times are always as the cubes of their diſtances; and, therefore, ſince they do not obſerve that law, which they neceſſarily muſt, if they ſwim in a vortex, it is a demonſtration that there are no vortices, in which the planets are carried round the ſun:—with more to the ſame purpoſe. Mr. Baker, conſidering the natural philoſophy of Des Cartes, obſerves, that, "though it would be very unjuſt to charge Des Cartes with the denial of a God, who is ſuppoſed by him to have created matter, and to have impreſſed the firſt motion upon it, yet he is blameable, that after the firſt motion is impreſſed, and the wheels ſet a going, he leaves his vaſt machine to the laws of mechaniſm, and ſuppoſes that all things may be thereby produced without any further extraordinary aſſiſtance from the firſt impreſſor. The ſuppoſition is impious, and, as he ſtates it, deſtructive of itſelf; for, not to deny him his laws of motion, moſt of which have been evidently ſhewn to be falſe, and conſequently ſo muſt all be that is built upon them, his notion of matter is inconſiſtent with any motion at all; for, as ſpace and matter are with him the ſame, upon this ſuppoſition there can be no motion in a *plenum*." Dr. Keil condemns Des Cartes for encouraging the preſumptuous pride of the modern philoſophers; who think they underſtand all the works of nature, and are able to give a good account of them. Mr. Leibnitz, whilſt he acknowledges that Des Cartes was a very learned man, and had read more than his followers imagine, and that he was one of thoſe, who has added moſt to the diſcoveries of their predeceſſors, obſerves, that thoſe who reſt entirely in him, are much miſtaken in their conduct; and this, he ſays, is true, even with regard to geometry itſelf. He alſo remarks, that Des Cartes endeavoured to correct ſome errors with regard to natural philoſophy, but that his preſumption and contemptuous manner of writing, together with the obſcurity of his ſtyle, and his confuſion, and ſevere treatment of others, are very diſagreeable. Voltaire, in his "Letters concerning the Engliſh Nation," (Lett. 14.) obſerves, that nature had favoured Des Cartes with a ſtrong and clear imagination, whence he became a very ſingular perſon both in private life, and in his manner of reaſoning. This imagination could not conceal itſelf even in his philoſophical writings, which are every where adorned with very brilliant and ingenious metaphors. Nature, ſays he, had almoſt made him a poet; and, indeed, he wrote a piece of poetry for the amuſement of Chriſtina, queen of Sweden, which, however, was ſuppreſſed in honour of his memory. He extended, continues he, the limits of geometry as far beyond the place where he found them, as ſir Iſaac Newton did after him; and firſt taught the method of expreſſing curves by equations. He alſo applied this geometrical and inventive genius to dioptrics, which, when treated by him, became a new art; and if he was miſtaken in ſome things, it was becauſe a man, who diſcovers a new tract of land, cannot at once know all the properties of the ſoil. Thoſe who come after him and make theſe lands fruitful, are at leaſt obliged to him for the diſcovery. Voltaire, however, acknowledges, that there are innumerable errors in the reſt of Des Cartes's works; and then adds, that geometry was a guide which he himſelf had in ſome meaſure formed, and which would have ſafely conducted him through the ſeveral paths of philoſophy; but that at laſt he abandoned this guide, and gave entirely into the humour of framing hypotheſes; and then philoſophy was no more than an ingenious romance, fit only to amuſe the ignorant. After other appropriate remarks, he concludes with theſe obſervations: "He deſtroyed all the abſurd chimæras with which youth had been infatuated for 2000 years. He taught his cotemporaries how to reaſon, and enabled them to employ his own weapons againſt himſelf. If Des Cartes did not pay in good money, he however did great ſervice in crying down that of a baſe alloy." Father Rapin, in his "Reflexions de Phyſique," after obſerving that Des Cartes's principles of motion, figure, and extenſion, are almoſt the very ſame with thoſe of Democritus and Epicurus, tells us, that father Merſenne mentioned in an aſſembly of learned men, that Des Cartes, who had gained great reputation by his geometry, was preparing a ſyſtem of natural philoſophy, in which he admitted a vacuum; but the notion was ridiculed by Roberval and ſome others; upon which Merſenne wrote to him, that a vacuum was not then in faſhion at Paris, which induced Des Cartes to change his ſcheme, in complaiſance to the natural philoſophers, whom he ſtudied to pleaſe, and admit the plenum of Leucippus; "ſo that," ſays father Rapin, "the excluſion of a vacuum became one of his principles, merely from political conſiderations." Rapin produces no authority for this ſtory; and it ſhould be recollected, that he was a very zealous Ariſtotelian, extremely prejudiced againſt any new ſyſtems of philoſophy.

Des Cartes, it is ſaid, imagined it poſſible to prolong life very conſiderably beyond the common period, and thought he had diſcovered the method of doing it. In converſation with ſir Kenelm Digby, Des Cartes aſſured him that, having already conſidered that matter, he would not venture to promiſe to render a man immortal; but that he was very ſure it was poſſible to lengthen out his life to the period of the patriarchs. It ſeems evident to me, ſays he, in a letter written to M. de Zuylichem from Egmond, in 1638, when he had attained the age of 42 years, that if we only guarded againſt certain errors, which we are accuſtomed to commit in the courſe of our diet, we might, without any other invention, attain to an old age, much longer and more happy than now we do. However, twelve years after this declaration was made, our philoſopher died. Des Cartes was never married, but had one natural daughter, named Francina, who died at five years of age. Of his works there have been ſeveral editions, ſeveral of which have been already mentioned.

For an account of the improvements made by Des Cartes in algebra and geometry, ſee the article ALGEBRA, and Montucla's Hiſt. Mathem. ubi infra. In reference to the diſpute between his friends and thoſe of Harriot, as to the priority of their diſcoveries, we ſhall here add, to what occurs under the article juſt cited, an anecdote told by Dr. Pell, and recorded by Dr. Wallis in his "Algebra." Sir Charles Cavendiſh, then reſident at Paris, had a converſation with M. Roberval concerning Des Cartes's geometry, then lately publiſhed, to this purport: "I admire," ſays Roberval, "that method of Des Cartes, of placing all the terms of the equation on one ſide, making the whole equal to nothing, and how it occurred to him: the reaſon why you admire it, ſaid ſir Charles, is, becauſe you are a Frenchman; for if you were an Engliſhman, you would not admire it. Why ſo? aſked Roberval. Becauſe, replied ſir Charles, we in England know whence he had it; namely, from Harriot's Algebra. What book is that? ſays Roberval; I never ſaw it. Next time you come to my chamber, ſaid ſir Charles, I will ſhew it to you; which, ſome time after, he did; and, upon peruſal of it, Roberval exclaimed with admiration, *Il l'a vu! Il l'a vu!* He had ſeen it! He had ſeen it! finding all that in Harriot which he had before admired in Des Cartes, and not doubting that Des Cartes had it from thence. Beſides, as Harriot's "Artis Analyticæ Praxis" was publiſhed in 1631, and Des Cartes was in England about this time, and as he follows the manner of Harriot, except in the method of noting the powers, it is highly probable that he was more indebted to the Engliſh algebraiſt than his partial advocates are willing to allow. For an account of Des Cartes's philoſophy; ſee the next article. Gen. Dict. Brucker's Hiſt. of Phil. by Enfield, vol. ii. c. 2. § 6. Montucla, Hiſt. Math. t. ii. p. 112, &c.

CARTESIAN *Philoſophy*, or CARTESIANISM, the ſyſtem of philoſophy advanced by Des Cartes, and maintained by his followers, the *Carteſians*.

The Carteſian philoſophy is founded on two great principles, the one metaphyſical, the other phyſical. The metaphyſical principle is this, *I think, therefore I am.* This principle has been attacked and defended, with great ſpirit, zeal, and partiality on both ſides; for though it be true that we are as ſure by an inward perception or conſciouſneſs, that we exiſt, as that we think; yet it is true, too, that the concluſion of this reaſoning, *I am*, is drawn from the antecedent *I think*; ſince *to think* ſuppoſes *to be*, or *exiſt*; and the mind ſees clearly the neceſſary connection between thinking and being.

In order to acquire this fundamental principle, this firſt and moſt certain truth in philoſophy, Des Cartes recommends to diveſt the mind of every kind of prejudice, and for this purpoſe to begin with doubting of every thing. Since the ſenſes err, and dreams deceive, it is firſt to be doubted, whether ſenſible objects have a real exiſtence; and we ought alſo to doubt concerning even mathematical axioms, becauſe we are not ſure that we may not have been ſo formed as to lie under a perpetual deception. But whatever elſe we doubt of, it is impoſſible we ſhould doubt, whether we ourſelves, who are conſcious of exerciſing the power of thinking, exiſt. Of ſuch importance, in the eſtimation of Des Cartes, is this kind of ſcepticiſm, that he adviſes his readers to conſider his reaſons for doubting of all things, not once only, but to employ weeks, or even months, on theſe alone, before they proceed any farther. Having eſtabliſhed the certainty of our own exiſtence, we are next to inquire what ſort of beings we are, before we admit the exiſtence of any thing external; and in the proſecution of this inquiry, we perceive belonging to our nature "thought," which has neither extenſion, figure, local motion, nor any other property which we commonly aſcribe to bodies, and of the exiſtence of which we have a prior or more certain knowledge, than of that of any thing corporeal. The mind having thus gained a knowledge of itſelf, but ſtill doubting the exiſtence of external objects, proceeds in the enlargement of its knowledge, and firſt finds within itſelf "ideas," concerning the exiſtence of which, as long as it reſtricts its contemplation merely to theſe, without offering or denying any thing like them to exiſt externally, it cannot be deceived. It alſo finds within itſelf certain "common notions," and from theſe frames various demonſtrations, of the truth of which, as long as its attention is directed to them, it is thoroughly perſuaded. But becauſe it does not yet know, whether it may not be ſo formed, as to be deceived in thoſe things which appear moſt evident, it perceives it to be impoſſible to admit any certain ſcience, till it has diſcovered the author of its being. Revolving within itſelf its various ideas, it finds one of a being ſupremely intelligent, powerful, and perfect, in which it diſcovers an exiſtence, not poſſible and contingent only, as in its ideas of all other things, but neceſſary and eternal. Since it finds within itſelf this idea of a ſupreme being, which could not be a fiction of its own, it concludes with certainty that it muſt have proceeded from a really exiſting deity, and conſequently that it repreſents a true and immutable nature, which cannot poſſibly not exiſt, that is God. According to this innate idea of Deity, we find him to be eternal, omniſcient, omnipotent, the fountain of all goodneſs and truth, the creator of all things; and as nothing can be an attribute of the divine nature, which implies limit or imperfection, he is, therefore, incorporeal, indiviſible, and void of paſſion, and exerciſes his underſtanding and volition, not by continued operations, but by the moſt ſimple action. Upon the will of this being, infinitely perfect, and neceſſarily exiſting, Des Cartes makes the certainty of ſelf-evident propoſitions or axioms, as well as of all other neceſſary truths, to depend. From the knowledge of the cauſe thus eſtabliſhed, he proceeds to deduce a complete knowledge of his effects by neceſſary ſteps; and he rejects all final cauſes from philoſophy; the moſt perfect kind of ſcience being, in his judgment, that of effects from their cauſes. From the veracity of the Deity, he infers the reality of material objects, which are repreſented by our ſenſes as exiſting without us. The idea of extended matter is preſented to the mind; if, therefore, matter did not really exiſt, God, who preſents this idea before the mind, would be a deceiver.

The phyſical principle of Carteſianiſm is this, that *nothing exiſts but ſubſtances*; and theſe are of two kinds, viz. one which thinks, or mind, and another which is extended, or body. The eſſence of the former is thought, and that of the latter extenſion; ſo that the thinking ſubſtance cannot be without ſome actual thought; nor can any part be retrenched from the extenſion of a thing, without taking away ſo much of its ſubſtance. Other attributes aſcribed to each of theſe ſubſtances are modes or qualities. The firſt article is oppoſed by Mr. Locke, who endeavours to ſhew, that thinking is not eſſential to the ſoul, or that its eſſence does not conſiſt in thought; but that there are various occaſions wherein it does not think at all. See DREAM. The latter is ſtrongly oppoſed by the Jeſuits, &c. as inconſiſtent with the doctrine of TRANSUBSTANTIATION; but is much better confuted by the modern writers, from the principles of the Newtonian philoſophy.

The ſole eſſential property of body being extenſion, and quantity differing from extended ſubſtance, only in our conceptions, ſpace, and the corporeal ſubſtance contained in it, are in reality the ſame; for extenſion in length, breadth, and depth, which conſtitutes ſpace, alſo conſtitutes body. Since extenſion is univerſal, Des Cartes naturally concludes there is no vacuum, nor any poſſibility thereof in nature; but that the world is abſolutely full: for mere ſpace is precluded by this principle; becauſe extenſion being implied in the idea of ſpace, matter is ſo too. If there were any ſuch thing as a vacuum, ſays he, it might be meaſured: the vacuum, therefore, is extended, and of conſequence is matter; every thing extended being matter. See VACUUM.

He adds, however, after denying a vacuum, or extenſion without matter, or properties of matter, that its parts are ſeparable and moveable; though theſe ſeem to imply more than mere extenſion. He defines motion to be the tranſlation of a body from the neighbourhood of bodies that are in contact with it, and conſidered as quieſcent, to the neighbourhood of other bodies; and thus deſtroys the diſtinction between abſolute or real, and relative or apparent motion; though both equally agree to this definition. He maintains that the ſame quantity of motion is always preſerved in the univerſe; becauſe God, he ſays, muſt be ſuppoſed to act in the moſt conſtant and immutable manner. And hence he likewiſe deduces his three laws of motion: according to which God, the firſt univerſal cauſe of all motion, in the beginning communicated motion to matter; viz. that a body muſt continue in its ſtate, as to reſt, motion, figure, &c. till ſome external influence produce a change, which is his firſt law of nature;—that the direction of motion is naturally rectilinear, or that a body never changes its direction of itſelf; which is his ſecond law:—and that a body in motion, when it meets with another moving with a greater force, is reflected without loſing any part of its firſt motion; but when it meets with a body moving with leſs force, it then carries this body along, and loſes as much motion as is tranſferred to it; and this is his third law of nature. He accounts for the hardneſs of bodies from their parts being quieſcent with reſpect to each other; and for fluidity from their being perpetually moved in all directions. Theſe principles, ſays Des Cartes, are ſufficient for explaining all the phenomena of nature; and no others ought to be admitted or even wiſhed for: and yet there is not hardly any one of them, that is not liable to inſuperable difficulties. Des Cartes concluded, from the immutability of the deity, that the ſame quantity of motion is always preſerved in the univerſe; whereas this quantity is continually varying: it is diminiſhed in the compoſition of motion, and in many caſes, in the colliſion of bodies that have an imperfect elaſticity; and it is increaſed in the reſolution of motion, and in ſome caſes, in the colliſions of elaſtic bodies. Moreover, it requires an active principle to account for the hardneſs of bodies, nor is it ſufficient for this purpoſe that the particles be at reſt; for this would not hinder their being ſeparated from each other by the leaſt force.

Theſe principles of phyſics once ſuppoſed, Des Cartes explains mechanically, and according to the laws of motion, how the univerſe might have aſſumed its preſent form, and may be for ever preſerved; and whence the preſent appearances of nature do ariſe. He ſuppoſes, that God created matter of an indefinite extenſion; that he divided this matter into little cubic portions, or maſſes full of angles; ſo as to repleniſh ſpace without leaving any interſtices between them; and that theſe particles, deriving from the motion impreſſed upon them an inceſſant agitation, which broke off their angular parts, became round, and formed what this ingenious and fanciful philoſopher calls the matter of the ſecond element. The angular parts themſelves, being ground into the moſt ſubtile particles of all, became the matter of his firſt element, and ſerved to fill all the pores of the other. But there being more of this firſt element than was neceſſary for that purpoſe, it became accumulated in the centres of the vortices, of which he imagined the univerſe to conſiſt, and formed there the bodies of the ſun and ſtars. For, according to this philoſopher, the ſolar ſyſtems were infinite in number, each fixed ſtar being the centre of one; and he, indeed, is among the firſt of the moderns, who thus removed the boundaries of the univerſe; even Copernicus and Kepler themſelves, having confined it within, what they ſuppoſed, the vault of the firmament. The centre of each vortex being thus occupied by the moſt active and moveable parts of matter, there muſt neceſſarily among them be a more violent agitation than in any other part of the vortex, and this violent agitation of the centre cheriſhed and ſupported the movement of the whole. The heavens were filled with the matter of the ſecond element, the medium of light. But the planets and comets conſiſted of a third element groſſer than the other two, the generation of which our philoſopher traces through all its ſteps. According to him, the matter of the firſt element muſt have conſtantly flowed out through the interſtices between the ſpherical particles of the ſecond element, where the circular motion is greateſt, and muſt have returned continually at the poles of this motion towards the centre of the vortex; where, being apt to cohere together, they at length produced the groſſer particles of the third element; and when theſe came to adhere in a conſiderable quantity, they gave riſe to the ſpots on the ſurfaces of the ſun or ſtars. Some being cruſted over with ſuch ſpots became planets or comets; and the force of their rotation becoming languid, their vortices were abſorbed by ſome more powerful neighbouring vortex. In this manner the ſolar ſyſtem was formed, the vortices of the ſecondary planets having been abſorbed by the vortex of the primary, and all of them by that of the ſun. Des Cartes alſo maintains, that the parts of the ſolar vortex increaſe in denſity, but decreaſe in celerity, to a certain diſtance; beyond which he ſuppoſes all the particles to be equal in magnitude, but to increaſe in celerity as they are farther from the ſun. In thoſe upper regions of the vortex he places the comets; in the lower parts he ranges the planets; ſuppoſing thoſe that are more rare to be nearer the ſun, that they may correſpond to the denſity of the vortex, where they are carried round. He accounts for the gravity of terreſtrial bodies from the centrifugal force of the ether revolving round the earth; which, he imagined, muſt impel bodies downwards that have not ſo great a centrifugal force, much in the ſame manner as a fluid impels a body upwards that is immerged in it, and has a leſs ſpecific gravity than the fluid. From the ſame principles he profeſſes to explain the phenomena of the magnet, and to account for every phenomenon in nature.

The ſyſtem of Des Cartes, notwithſtanding its defects and errors, and though in ſome reſpects it has more the appearance of a romance than of a juſt philoſophy, was diſtinguiſhed in an eminent degree by its ſubtlety, ingenuity, and originality; ſo that it not only engaged the attention of the learned, but long continued, in the midſt of all the oppoſition with which it had to encounter from the profeſſed enemies of innovation, to be zealouſly defended by many able writers, and to be publicly taught in the ſchools throughout all Europe. If we trace Carteſianiſm to its origin, we ſhall find that ſome parts of it appear to have been derived from the Grecian philoſophy: particularly the notion of innate ideas, and of the action of the ſoul upon the body, from Plato; the doctrine of a plenum from Ariſtotle; and the elements of the doctrine of vortices from the atomic ſchool of Democritus and Epicurus; but Des Cartes contrived, by the vigorous powers of his genius and the fertility of his imagination, to form of theſe and ſimilar materials a new ſyſtem of philoſophy, which profeſſed to reſolve all difficulties, and to comprehend a ſatisfactory explanation of all the phenomena of nature. His labours, however, would have been more valuable, if he had not ſuffered himſelf to be led aſtray into the romantic regions of hypotheſis by the falſe notion, that the nature of things may be better underſtood by endeavouring to account for appearances from hypothetical principles, than by inferring general principles from an attentive obſervation of appearances. Accordingly, his fondneſs for hypotheſis led him to confound the ideas of attribute and ſubſtance, as in his definitions of matter and ſpace; and thoſe of poſſibility and probability, as in his doctrine of vortices. Even his celebrated argument for the exiſtence of God, which, indeed, had long before his time been advanced by St. Anſelm, archbiſhop of Canterbury, in his book "Contra Inſipientem," and by St. Thomas Aquinas, and other ſcholaſtic writers, confounds the idea of an infinite being with the actual exiſtence of that being, and ſubſtitutes a mere conception of the meaning of a term in the place of the idea of a being really and ſubſtantially exiſting. Not to add, what is much to be regretted, that, though his whole ſyſtem is built upon the knowledge of God, and ſuppoſes his agency, in eſtabliſhing the doctrine of a deity, he forſook the clear and ſatisfactory ground of final cauſes, and had recourſe to a ſubtle argument, which few can comprehend, and with which fewer ſtill will be fully ſatisfied.

In the revolution which the ſyſtem of Des Cartes produced among metaphyſicians and philoſophers, the ſuperiority of his genius was aided by the peculiar circumſtances of the times; and it required the efforts of ſuch a genius to demoliſh the ſtructure of Ariſtotelian philoſophy. Ariſtotle had been, for more than a thouſand years, regarded as an oracle; and his authority was the teſt of truth. The Peripatetic doctrines were ſo incorporated with the whole ſyſtem of ſcholaſtic theology, that to diſſent from Ariſtotle was to alarm the church. However, the prevailing ſyſtem was beginning to loſe its authority; Des Cartes perceived its defects; and he ſeized the favourable moment to introduce and eſtabliſh a new ſyſtem. Having applied much to the mathematical ſciences, and having made conſiderable improvement in them, (ſee the preceding article), he wiſhed to introduce that perſpicuity and evidence into other branches of philoſophy which he found in them. To him we muſt allow the honour of having been the firſt who drew a diſtinct line between the material and intellectual world; which, in all the old ſyſtems, were ſo blended together, that it was impoſſible to ſay where the one ends and the other begins. In that part of philoſophy which relates to the mind, Des Cartes laid the foundation, and put us into that track, which all wiſe men now acknowledge to be the only one in which we can expect ſucceſs. With regard alſo to phyſics, or the philoſophy of body, if he had not the merit of leading men into the right track, we muſt allow him that of bringing them out of a wrong one. By the diffuſion of the Carteſian ſyſtem, *materia prima*, ſubſtantial forms, and occult qualities, with all the jargon of the Ariſtotelian phyſics, fell into utter diſgrace, and were never mentioned by the followers of the new ſyſtem, but as a ſubject of ridicule. Ariſtotle, after a reign of more than 1000 years, was now expoſed as an object of deriſion even to the vulgar, arrayed in the mock majeſty of his ſubſtantial forms and occult qualities. Queens and princeſſes, the moſt diſtinguiſhed perſonages of the age, courted the converſation of Des Cartes, and became adepts in his philoſophy. In this number we may reckon Chriſtina, queen of Sweden, and Elizabeth, daughter of Frederic, king of Bohemia, the mother of our royal family. The laſt, though very young when Des Cartes wrote his "Principia," he declares to be the only perſon whom he knew, who perfectly underſtood not only all his philoſophical writings, but the moſt abſtruſe of his mathematical works. The triumph of the Carteſian ſyſtem over that of Ariſtotle is one of the moſt remarkable revolutions in the hiſtory of philoſophy. When his authority ceaſed, that reverence for hard words and dark notions, by which men's underſtandings had been ſtrangled in early years, was turned into contempt, and every thing ſuſpected which was not clearly and diſtinctly underſtood. This is the ſpirit of the Carteſian philoſophy; and it is a more important acquiſition to mankind than any of its particular tenets; and although after the ſober method of philoſophiſing, introduced by lord Bacon, began to be generally adopted, and the fabrications of romantic theories gave way to the experimental ſtudy of nature, the ſyſtem of Des Cartes, like "the baſeleſs fabric of an air-viſion," has diſappeared, and has ſcarcely "left a wreck behind;" yet for exciting this ſpirit ſo zealouſly, and ſpreading it ſo ſucceſsfully, Des Cartes deſerves immortal honour. Beſides, by introducing geometry into phyſics, and accounting for natural phenomena from the laws of mechanics, he did infinite ſervice to philoſophy; and contributed both by his practice and example, to free it from that venerable ruſt, which in a long ſucceſſion of ages it had contracted: and thus to him, in ſome meaſure, is owing the preſent ſyſtem of the mechanical, and even of the Newtonian philoſophy.

After the above detail, we ſhall not wonder that the Peripatetics, or Ariſtotelians, ſeconded by the influence of the clergy, who apprehended that the cauſe of religion was aimed at and endangered by the philoſophical innovations of Des Cartes, ſhould excite a clamour, and exert their utmoſt efforts to prevent the overthrow of their old ſyſtem, and to diminiſh the growing reputation of the new philoſophy. In order the more readily and effectually to execute this invidious purpoſe, they not only accuſed Des Cartes of the moſt dangerous and pernicious errors, but proceeded, in the extravagance of their malignity, to allege againſt him a charge of atheiſm, which thoſe who are acquainted with his avowed principles, and with the baſis of his ſyſtem, muſt perceive to have been altogether unfounded. The Theoſophiſts, Roſicrucians, and Chemiſts alſo entered into the conteſt againſt Des Cartes, though they conducted themſelves with greater moderation than the Ariſtotelians. The conſequences of this diſpute were, however, favourable to the progreſs of ſcience; for many European philoſophers, who were adverſe to the diſcriminating ſentiments of Des Cartes, were nevertheleſs encouraged by his example to purſue their inquiries with greater freedom from the reſtraints of tradition and perſonal authority, than they had formerly done, and to emancipate themſelves from that yoke of ſervitude under which Ariſtotle and his followers had ſo long kept them in ſubjection. Among the moſt eminent cotemporaries of Des Cartes, who applauded, in general, the efforts he made towards the reformation of philoſophy, and the noble reſolution with which he broke the ſhackles of magiſterial authority, and who alſo acknowledged that he had made valuable diſcoveries in philoſophy, there were ſome who diſcovered ſeveral eſſential defects in his philoſophy, and who conſidered it in various reſpects as hypothetical, founded on fancy rather than experience. They actually attacked the fundamental principles upon which his whole ſyſtem of philoſophy was built, ſuch as his ideas of the Deity, of the univerſe, of matter and ſpirit, of the laws of motion, and other points that were connected with theſe. Some of theſe principles they pronounced to be uncertain; others of a pernicious tendency, and adapted to produce the moſt dangerous errors; and others again they conſidered as directly contrary to the language of experience. At the head of theſe objectors was his own fellow-citizen Gaſſendi, who had made war before him upon the Ariſtotelians and Chemiſts; who, in genius, was his equal; in learning, far his ſuperior; and whoſe mathematical knowledge was moſt uncommon and extenſive. Gaſſendi firſt attacked thoſe mathematical principles, which ſupported the whole ſtructure of the Carteſian philoſophy; he then proceeded to ſubſtitute, in the place of the Carteſian ſyſtem, one that reſembled the natural philoſophy of Epicurus, though much more rational, conſiſtent, and perfect. See GASSENDI. The controverſy between theſe philoſophers, Gaſſendi and Des Cartes, produced two leading philoſophical ſects, denominated the *Mathematical* and *Metaphyſical*, which ſee.

Carteſianiſm was nearly prohibited by an arret of the parliament of Paris; and had been ſo in effect, if it had not been prevented by a burleſque addreſs preſented to the firſt preſident. After the Carteſian philoſophy had been favourably received, it was vehemently attacked, in the year 1639, by Voet, profeſſor of theology at Utrecht, who regarded it as a ſyſtem of impiety; and this aſſertion he grounded upon the following principles by which it was introduced: viz. "that the perſon who aſpires after the character of a true philoſopher muſt begin by doubting of all things, even of the exiſtence of a Supreme Being—that the nature or *eſſence* of ſpirit, and even of God himſelf, conſiſts in *thought*—that ſpace has no real exiſtence, is no more than the creature of fancy—and that, conſequently, *matter* is without bounds." Des Cartes defended his principles; but Voet was ſeconded by the moſt eminent Belgic divines, and applauded by the greateſt part of the Dutch clergy. In 1656, when the principles and tenets of Des Cartes were applied to the illuſtration of theological truth, an alarm was raiſed in the Dutch churches and ſchools of learning, and it was reſolved in ſeveral of their eccleſiaſtical aſſemblies not to permit that *imperious* philoſophy, as Carteſianiſm was called, to make ſuch encroachments upon the domain of theology. The ſtates of Holland approved this reſolution, and iſſued a public edict, forbidding both the profeſſors of philoſophy and theology either to explain the writings of Des Cartes to the youth under their care, or to illuſtrate the doctrines of the goſpel by the principles of philoſophy. It was further reſolved by an aſſembly of the clergy, held at Delft in the following year, that no candidate for holy orders ſhould be received into the miniſtry before he made a ſolemn declaration, that he would neither promote the Carteſian philoſophy, nor disfigure the divine ſimplicity of religion, by loading it with foreign ornaments. Laws of a like tenor were afterwards paſſed in the United Provinces, and in other countries. But all theſe meaſures were ineffectual to ſtop the progreſs of Carteſianiſm, which, at length, obtained a ſolid and permanent footing in the ſeminaries of learning, and was applied, both in the academies and pulpits, and ſometimes indeed very prepoſterouſly, to explain the truths and precepts of Chriſtianity. See on the ſubject of this article, Maclaurin's Account of ſir Iſaac Newton's Philoſophical Diſcoveries, b. i. c. 4. Brucker's Hiſt. of Phil. by Enfield, vol. ii. c. ii. § 6. Cudworth's Inſt. Syſt. ch. v. § 1. Reid's Eſſays on the Intellectual Powers of Man, ch. viii. Smith's Eſſ. on Philoſ. Subjects, p. 76. Moſheim's E. H. vol. v.

CARTHAGE, in *Ancient Geography*, one of the moſt powerful cities of antiquity, was for many ages the capital of Africa Propria, called alſo the territory of Carthage. See Africa. It was at firſt called *Cadmeia*, i. e. the eaſtern, from the name of Cadmus, which was common to the chiefs of the Phœnician colonies. It was alſo denominated *Caccabe*, which in the Phœnician language ſignified a horſe's head, found, as tradition reports, by the Tyrians, when they were digging for the foundations of the fortreſs called *Byrſa*, and conſidered as an omen portending the martial diſpoſition of the inhabitants, and the future greatneſs of the city. To this circumſtance Virgil refers, Æn. l. i. v. 447.

> " ——— Pœni
> Effodere loco ſignum, quod regia Juno
> Monſtrârat, caput acris equi ; ſic nam fore bello
> Egregium, et facilem victu per ſæcula gentem."
>
> " The Tyrians landing near this holy ground,
> And digging here, a proſp'rous omen found ;
> From under earth a courſer's head they drew,
> Their growth and future fortune to foreſhew :
> This fated ſign their foundreſs Juno gave,
> Of a ſoil fruitful, and a people brave." Dryden.

On account of this event the Carthaginians had frequently, upon the reverſes of their coins, either a horſe's head, or the body of a horſe dimidiated, or a horſe entire, with Victory mounted upon him. Others ſay, that when Dido arrived in this country, a city actually exiſted called *Utica*, or the ancient; and that ſhe called her city *Cartha-hadath*, or *Carthadt*, קרתא הדתא, that is, the new city ; and from this appellation the Greeks, interchanging χ and ϑ, deduced Καρχηδὼν, *Carchedon*, and the Romans *Carthago*. Among the more ancient Romans, however, the name of this city, derived from the Carthaginians themſelves, was *Cataco*, as appears from the Columna Roſtrata of Duilius.

Authors are much diſagreed with regard to the æra of the foundation of Carthage. It was built, according to Velleius, 65 years, but according to Trogus and Juſtin, 72 years, before Rome. Livy ſeems to place its foundation 20 years higher than theſe ; and Solinus exceeds him 27 years. From Menander the Epheſian, cited by Joſephus, and the Tyrian Annals, it appears to have preceded the Roman æra 140 years. According to Livy and Appian, Carthage ſtood ſomewhat above 700 years, and Solinus, adding the odd number of years, reckons the period of its exiſtence 737 years ; and as it was deſtroyed under the conſulate of Lentulus and Mummius, in the year of the Julian period 4568, the 608th of the Roman æra, and the 146th year before Chriſt, if we reckon backwards 737 years, we ſhall aſcend to the 883d year B. C. the ſecond year of Athaliah, queen of Judah ; and the encœnia, or dedication of the city, ſays ſir Iſaac Newton (Chron. apud Works by Horſley, vol. v. p. 50.). will fall upon the 16th year of Pygmalion, the brother of Dido, and king of Tyre. She fled in the 7th year of Pygmalion, i. e. in the year 874 B. C. the 4th year of Joaſh king of Judah ; but the æra of the city began with its encœnia. Joſephus (Cont. Ap. l. i. c. 18.) reckons 143 years from the building of Solomon's temple to the building of Carthage, which laſt epoch he ſeems not to diſtinguiſh from the flight of Dido in the 7th of Pygmalion. The temple was dedicated in the year 1004 B. C. and thus the 7th of Pygmalion will be the 861ſt year B.C. and the 16th of Pygmalion will be the 852d year B.C. Solomon ſurvived the building of the temple 30 years; and therefore the interval from Solomon's death to the flight of Dido will be 113 years, from which ſubtracting 7 years, there will remain 106 years for the interval between Solomon's death and the beginning of Pygmalion's reign ; and allowing that Solomon died in the 975th year B.C. the 7th of Pygmalion will be the 862d year, B. C. and the 16th of Pygmalion will be the 853d year, B. C. Petavius (Rat. Temp. l. ii. c. 13), after conſidering the contradictory opinions of the ancients with great attention, fixes the Carthaginian æra with an apparent exactneſs ; for, according to him, Dido began to build Carthage 137 years before the foundation of Rome, if, with Varro, we place this in the 4th year of the 6th Olympiad (753 years, B. C.) or 142 years, if, with archbiſhop Uſher, we prefer the account of Fabius Pictor, the moſt ancient of the Roman hiſtorians, and a writer of great authority, who maintains it to be near the beginning of the eighth, or 748 years, B. C. Blair, in his Tables, has aſſigned the æra of the building of Carthage to the 869th year, B. C. In order to reconcile the diſcordant accounts that have been given of this æra, it has been ſuggeſted, that Carthage conſiſted of different parts, which are ſuppoſed to have been built at different times. Cothon, or the port, together with the buildings belonging to it, was firſt built ; Megara, which, in reſpect of Cothon, was called the new town, or Carthada, was built about 194 years later, and Byrſa, about 166 years after Megara.

Whatever difference of opinion may have ſubſiſted among chronologers about the æra of Carthage, it is generally agreed that the Phœnicians were its founders. Euſebius (in Chron.) and Procopius (de bell. Vand.) affirm poſitively, that the Canaanites who fled from Joſhua retired hither ; and St. Auſtin (in Expoſ. ad Epiſt. ad Roman.) is of opinion, that the Carthaginians were deſcended from theſe Canaanites. Philiſtus of Syracuſe, who lived 550 years before Chriſt, relates (apud Euſeb. in Chron.) that the firſt traces of Carthage were owing to Zorus and Charchedon, two Tyrians or Phœnicians, 30 years before the deſtruction of Troy in the year 1184, B. C. according to Euſebius. Appian (in Libyc.) attributes this event to the ſame two Phœnicians, 50 years before that period ; and from him Scaliger corrects the numbers of Euſebius. Accordingly, Dido was induced to chuſe this place for her Tyrians in preference to any other, becauſe it had been inhabited for ſome time by the Phœnicians, who were her countrymen, and from whom ſhe had, therefore, reaſon to expect a friendly reception. To this Tyrian princeſs the concurrent voice of antiquity aſcribes the firſt ſettlement of Carthage. See Juſt. l. xviii. c. 4. 5, 6. App. de bell. Punic. p. 1. Strabo, l. xvii. p. 832. Paterc. l. i. c. 6. This princeſs, called Eliſa, but better known by the name of Dido, was the grand daughter of the famous Jezebel, called in ſcripture Ethbaal, and the great grand-daughter of Ithobal, king of Tyre. She married her near relation Acerbas, otherwiſe called Sicharbas and Sichæus, a very rich prince, and her brother was Pygmalion, king of Tyre. When this prince murdered Sichæus, in order to ſeize his immenſe treaſures, Dido, in order to elude the avarice of her brother, withdrew ſecretly with her deceaſed huſband's poſſeſſions ; and after having long wandered in queſt of a commodious ſettlement, ſhe, and her Tyrian attendants, landed on the coaſt of the Mediterranean, in the gulf where Utica ſtood ; fixed her reſidence at Carthage ; and either founded, or moſt probably, much enlarged this noble city. The wealth of her huſband, and the ſkill of the Tyrians, who accompanied her, and who were at this time the moſt poliſhed and ingenious people in the world, enabled her to enlarge and beautify the place, if ſhe did not lay the foundation of it ; to wall it round, and build a ſtrong citadel in it ; to lay the baſis of a moſt flouriſhing and extenſive commerce for which the Tyrian nation was ſo renowned ; and to introduce a form of government, which Ariſtotle ſeemed to think one of the moſt perfect that ever was known in the world. Some writers have affirmed, that Dido outwitted the natives, by deſiring to purchaſe of them, for her intended

tended ſettlement, only ſo much land as an ox's hide would compaſs. This modeſt requeſt was inſtantly complied with; upon which ſhe cut the hide into the ſmalleſt thongs, and with them compaſſed a large tract of ground, on which ſhe built a citadel, called Byrſa, from the hide. But this tale is generally exploded by the learned. This princeſs, it is ſaid, was afterwards courted by Jarbas, king of Getulia, and threatened with a war in caſe of refuſal. Dido having bound herſelf by an oath not to contract a ſecond marriage, and being incapable of violating her engagement to Sichæus, deſired time for deliberation, and for appeaſing the manes of her firſt huſband by ſacrifice. Having therefore ordered a pile to be raiſed, ſhe aſcended it; and drawing out a dagger which ſhe had concealed under her robe, ſtabbed herſelf with it. This ſtory is related with ſome different particulars by Juſtin, l. xviii. c. 6.

Virgil has much altered this hiſtory, by ſuppoſing that Æneas, his hero, was cotemporary with Dido, though there was an interval of nearly three centuries between the one and the other; the æra of the building of Carthage being fixed 300 years lower than the deſtruction of Troy. However, in the plan of his ſtory he has diſplayed great judgment; for as he wrote for the Romans he has contrived to intereſt them the more, by introducing the implacable hatred which ſubſiſted between Carthage and Rome, and ingeniouſly deducing the origin of it from the very remote foundation of theſe two rival cities.

Carthage was ſituated at the bottom of a gulf, upon a peninſula 360 ſtadia, or 45 miles in circumference; the iſthmus joining this peninſula to the continent of Africa being 25 ſtadia, or three miles and a furlong in breadth. Dr. Shaw, (Travels, p. 82.) concludes from an eſtimate made on the ſpot, that the peninſula is about 30 miles round, and that the city may have taken up nearly half that ſpace. On the weſt ſide, a long tract of land, half a ſtadium broad, projected from it, which running into the ſea ſeparated it from a lake, or moraſs, and was ſtrongly fortified on all ſides by rocks, and a ſingle wall. In the middle of the city ſtood the fortreſs, or citadel, erected by Dido, called *Byrſa*, which is a Greek corruption of the Punic, or Phœnician name *Bozra*, *Boſya*, or *Botſra*, denoting a fortreſs, or citadel; and this etymology excludes the fable of the ox's hide. Byrſa, according to Servius, (in Virgil), was 22 ſtadia, or near three Engliſh miles in circumference; though Eutropius maintains that it did not much exceed 2000 paces, or not quite two miles. It contained a rich, beautiful, and ſpacious temple ſacred to Æſculapius, ſeated on a very high hill, which was aſcended by 60 ſteps. Aſdrubal's wife ſet fire to it, and entirely conſumed it, together with herſelf, her children, and 900 Roman deſerters, who had fortified themſelves in this place in order to avoid falling into the hands of Scipio. On the ſouth ſide, towards the continent, where Byrſa ſtood, the city was ſurrounded by a triple wall 30 cubits high, excluſive of the parapets and towers, with which it was flanked at equal diſtances, each interval being 480 feet. Each tower had its foundation ſunk 30 feet deep, and was four ſtories high, though the wall was but two: they were arched, and in the lower part, correſponding in depth with the foundation above-mentioned, were ſtalls, large enough to hold 300 elephants, with their fodder; over theſe were ſtables for 4000 horſes, and lofts for their food. There was likewiſe room enough to lodge 20,000 foot and 4000 horſe. Here were two harbours, diſpoſed in ſuch a manner as to communicate with each other, and having a common entrance, 70 feet broad, ſecured with chains. The firſt was appropriated to the merchants, and included a great number of places of refreſhment and all kinds of accommodation for the ſeamen. The ſecond, or inner port, was, as well as the iſland, called *Cothon*, in the midſt of it, lined with large keys, in which were diſtinct receptacles for ſecuring and ſheltering from the weather 220 veſſels, and it was deſigned chiefly for ſhips of war. Strabo calls the ſmall iſland Cothon; but Appian applies the term likewiſe to the port, or harbour itſelf. So active were the Carthaginians, that before Scipio had blocked up the old port of Cothon, they in a ſhort time built a new haven, the traces of which are ſtill to be ſeen. See Cothon. Near the Cothon was a temple of Apollo, in which was a ſtatue of that deity of maſſive gold; and the inſide of the temple was covered with plates of the ſame metal, weighing 1000 talents. Over the receptacles juſt mentioned were magazines, or ſtore-houſes, containing all neceſſaries for the arming and equipping of fleets. The entrance into each of theſe receptacles was adorned with two marble pillars of the Ionic order; ſo that both the harbour and the iſland repreſented on each ſide two magnificent galleries. The admiral's palace was ſo ſituated on the iſland, juſt oppoſite to the mouth of the harbour, that he could diſcover whatever was doing at ſea, although no one there could perceive what was tranſacting in the inner part of the harbour; nor had the merchants, when they entered the port, any proſpect of the men of war, being ſeparated from them by a double wall, and each port having its ſeparate gate that led into the city, without paſſing through the other. The *Byrſa* was conſidered as the interior part of Carthage, and was ſurrounded by the *Megara*, or *Megaria*, that is, the houſes or towns, for ſo the word ſignifies in the Phœnician tongue, or its exterior part; and thus taken together, they formed a kind of double town.

As to the extent of the city, Livy informs us, that it was 23 miles in circumference; and Pliny (l. v. c. 4.) intimates, that Carthage, when poſſeſſed by the Phœnicians, was much larger than when it became a Roman colony; and Suidas affirms, that it was the greateſt and moſt powerful city in the world. The number of inhabitants contained in this city amounted, at the beginning of the third Punic war, to 700,000. The forces which they were able to bring into the field, and the power which they were capable of exerciſing at ſea, were very formidable. Hamilcar, in his expedition againſt Gelon, the tyrant of Syracuſe, commanded an army conſiſting of 300,000 men, and the fleet, co-operating with the land forces, was compoſed of more than 2000 ſhips of war, and above 3000 tranſports. Their riches were likewiſe immenſe; for at the final deſtruction of the town, even after it had been plundered, and ſuppoſed to be entirely exhauſted and conſumed, Scipio carried away nearly a million and a half ſterling. The dominion of Carthage was not long confined to Africa. Strabo obſerves (Geog. lib. xvii.) that the Carthaginians poſſeſſed 300 cities in Africa, before the beginning of the third Punic war; nor is this incredible, if we conſider, that the dominions of this ſtate in Africa, before that war extended from the weſtern confines of Cyrenaica to the pillars of Hercules, or the ſtraits of Gibraltar, a tract of land near 1500 miles in length. The inhabitants of its ambitious city extended their conqueſts into Europe, by invading Sardinia, ſeizing a great part of Sicily, and the iſlands W. of it, and reducing almoſt all Spain, even as far as the Pyrenées, and having ſent powerful colonies every where, they enjoyed the empire of the ſea for more than 600 years; and formed a ſtate which was able to diſpute pre-eminence with the greateſt empires of the world by their wealth, their commerce, their numerous armies, their formidable fleets, and, above all, by the courage and talents of their officers.

Carthage, as Dr. Shaw informs us, (Travels, p. 81.) was built upon three hills, ſomewhat inferior in elevation to thoſe upon which Rome was erected. This famous city, after undergoing a variety of revolutions, was at length deſtroyed by Scipio Æmilianus, under the conſulate of Lentulus and Mummius, in the 146th year B. C. The Romans, after having completely deſtroyed it, ordered that it ſhould never be inhabited, denouncing dreadful imprecations againſt thoſe, who, contrary to their prohibition, ſhould attempt to rebuild any part of it, eſpecially Byrſa and Megara. About 24 or 30 years after this event, C. Gracchus, tribune of the people, in order to ingratiate himſelf with them, undertook to rebuild it, and with that view conducted thither a colony of 6000 Roman citizens; and this was the firſt Roman colony that was ever ſent out of Italy. Plutarch intimates, that Gracchus executed his deſign, which was done in a very imperfect manner; but it is more probable that the work was entirely diſcontinued, however vigorouſly begun, in compliance with the orders of the ſenate. Julius Cæſar, as Appian informs us, conceived a deſign, in conſequence of a nightly dream or viſion, of rebuilding Carthage. But his untimely death prevented the completion of his purpoſe. However, Appian ſays, that his adopted ſon, Auguſtus Cæſar, built a city at a ſmall diſtance from the ſpot on which ancient Carthage ſtood, and called it by the ſame name; thus avoiding the ill effects of thoſe imprecations, which had been pronounced at the time of its deſtruction. Thither, it is ſaid, he ſent a colony of 3000 men, who were ſoon joined by conſiderable numbers from the neighbouring towns. Strabo, on the other hand, intimates, that both Carthage and Corinth were rebuilt at the ſame time by Julius Cæſar; and he affirms, that Carthage in his time, that is in the reign of Tiberius, was equal, if not ſuperior, to the largeſt city in Africa. Plutarch confirms the teſtimony of Strabo. Pliny alſo mentions it as a conſiderable colony in his days. Carthage was eſteemed the ſecond city in the Roman dominions, and conſidered as the capital of Africa for ſeveral centuries after the commencement of the Chriſtian æra. Its biſhops, who were ſubordinate to the biſhop of Rome, and not to the patriarchs of Alexandria, occupied a diſtinguiſhed rank in the weſtern church. Maxentius laid it in aſhes about the ſixth or ſeventh year of Conſtantine's reign, A. D. 311 or 312; and Genſeric, king of the Vandals, took it A. D. 439. At this time Carthage contained the manufactures, the arms, and the treaſures of the ſix provinces. Schools and gymnaſia were inſtituted for the education of the African youth; and the liberal arts and manners, grammar, rhetoric, and philoſophy, were publickly taught in the Greek and Latin languages. The buildings of the city were uniform and magnificent; a ſhady grove was planted in the midſt of it; the new port, a ſecure and capacious harbour, ſubſerved the commercial induſtry of citizens and ſtrangers; and the ſplendid games of the circus and theatre were exhibited almoſt in the preſence of the Barbarians. The reputation of the Carthaginians was not equal to that of their country, and the reproach of Punic faith ſtill adhered to their ſubtle and faithleſs character. The habits of trade, and the abuſe of luxury, had corrupted their manners; but their impious contempt of monks, and the ſhameleſs practice of unnatural luſts, are the two abominations which are particularly reprobated by Salvian, the preacher of that age. The king of the Vandals, however, ſeverely reformed the vices of a voluptuous people; and the ancient, noble, ingenuous freedom of Carthage was reduced by Genſeric into a ſtate of ignominious ſervitude. After he had permitted his licentious troops to ſatiate their rage and avarice, he inſtituted a more regular ſyſtem of rapine and oppreſſion. An edict was promulgated, which enjoined all perſons, without fraud or delay, to deliver their gold, ſilver, jewels, and valuable furniture or apparel, to the royal officers; and the attempt to ſecrete any part of their patrimony was inexorably puniſhed with death and torture, as an act of treaſon againſt the ſtate. The lands of the proconſular province, which formed the immediate diſtrict of Carthage, were accurately meaſured, and divided among the Barbarians; and the conqueror reſerved, for his peculiar domain, the fertile territory of Byzacium, and the adjacent parts of Numidia and Getulia. Beliſarius retook it in 533 and annexed it again to the Roman empire. In this revolution the trade of Carthage was not interrupted; the ſhops continued open and buſy; and the ſoldiers, after ſufficient guards had been poſted, modeſtly departed to the houſes, which were allotted for their reception. Beliſarius fixed his reſidence in the palace; ſeated himſelf on the throne of Genſeric; accepted and diſtributed the Barbaric ſpoil; granted their lives to the ſuppliant Vandals; and laboured to repair the damage which had been ſuſtained by the ſuburbs in the preceding night. At ſupper he entertained his principal officers with the form and magnificence of a royal banquet. He reſtored with incredible diſpatch the walls and ditches of the city, and re-eſtabliſhed the ſtrength of an impregnable fortreſs. At laſt the Saracens, under Mohammed's ſucceſſors, towards the cloſe of the ſeventh century, A. D. 698, ſo completely deſtroyed this city, that few traces of it are left. All the remains, ſays Dr. Shaw, of this once famous city are the area of a ſpacious room upon one of the hills on which it ſtood, commanding the ſouth-eaſt ſhore, with ſeveral ſmaller ones at a little diſtance from it; the common ſewers, which time hath not in the leaſt injured or impaired; and the ciſterns, which have ſhared only in a ſmall degree the general ruins of the city. The harbour, indeed, is now ſtopped up, and by the north-eaſt winds, with the river Mejerda, the ancient Bagrada, moved almoſt as far diſtant from the ſea as Utica; though it is ſtill called "El Merſa," or the Port, lying to the north and north-weſt of the city, and forms, with the lake of Tunis, the peninſula on which Carthage ſtood. Livy tells us, that Carthage was only 12 miles from Tunis, and this is the diſtance that ſtill ſubſiſts between that city and a fragment of the weſtern wall of Carthage. Polybius indeed makes the diſtance between Tunis and Carthage 15 miles. The ſpot on which it ſtood is, according to the lateſt obſervations, about N. lat. 36° 52′. E. long. 10° 40′. See CARTHAGINIANS.

CARTHAGENA, in *Geography*, *New Carthage*, a ſea-port town of Spain, in the province of Murcia; ſeated on the declivity of a hill, and ſeparated from the harbour by an intermediate plain. The city is protected from the ſouth and from the weſt by high mountains and barren rocks; but to the north and eaſt it is open, and communicates with an extenſive valley, which is divided from the plain of Penilla by a ridge of hills, whilſt to the north, another chain of mountains ſeparates it from the vale of Murcia. On the ſummit of the hill, commanding the city, is a caſtle now decaying; but, on the adjacent heights, are raiſed conſiderable works, to defend the harbour, with the arſenal and dock-yard. The harbour is the beſt in Spain, well ſheltered from winds, and well defended. The arſenal is large, and ſo amply furniſhed with naval ſtores, that a ſhip of the line, as it is ſaid, may be got ready for ſea in three days. The number of inhabitants is reckoned to be 60,000, who are diſtributed in 15,000 families. The ſtreets are wide, and the houſes are commodious. They have generally flat roofs, which afford, in this climate, an agreeable and cool retreat, where, after ſun-ſet, the inhabitants aſſemble to enjoy the refreſhing breeze; the new parade, extending eaſt and weſt at the head of the harbour, and looking through its entrance into the Mediterranean, is built on a regular plan; and as a high ſchiſtous rock has been cut away to make room for this long range of habitations, excellent vaults are excavated behind each houſe, for the ſervice of the merchants. At the end of this ſtands the royal hoſpital, deſtined to receive the ſick from the dock-yard and the army, with the "preſidiaros," or criminals condemned to the gallies, and in Spain reduced to the loweſt ſtate of ſervitude. The cathedral, which is a wretched pile, is now degraded, and the biſhop's ſee being removed to Murcia, it is become a pariſh church. Of nine convents, eight are occupied by the men. In the midſt of the dock-yard is a ſpacious baſon, and in this the ſhips of war are moored, each in front of the magazine deſtined to receive her rigging and her ſtores. The docks are kept dry by fire-engines, of which three are almoſt conſtantly at work. They have here 2000 criminals, chiefly ſmugglers, who, being condemned to work in chains, are called "preſidiaros." They are employed in the moſt ſervile labour, for 5 or for 7 years; and at the expiration of their terms, they are turned looſe upon the public, fitted only to purſue their original occupations. Theſe 2000 ſlaves require a conſtant guard of 500 ſoldiers; and independently of this expence, they coſt each to government, five reals a day for their maintenance, whilſt their work cannot be eſtimated at one-tenth of what they eat. In this dock-yard the maſts and timber are floated in water, without any apprehenſion of injury from the worm; becauſe, as they never open their ſluices till the water is become putrid, the rapid evaporation leaves a ſtrong brine, in which it is impoſſible for the worm to live.

The fiſhery of this ſea-port is conſiderable; and is divided into two branches, independent of each other; that within the port being the property of a fiſhing company, conſiſting of 18 aſſociates, eſtabliſhed here by charter, whilſt, in the open ſea, all enrolled mariners are at liberty to fiſh. Within the port they take chiefly the tunny and the melvas; but the former is the moſt profitable. Half the quantity of fiſh that is taken in the harbour, muſt be ſold for the benefit of the poor at a ſtipulated price; and the king takes one-half of all their profits, amounting to about 1000l. a year, as a compenſation for his claim of one-quarter of their fiſh. In the open ſea the fiſhermen are free from oppreſſion and have peculiar privileges.

At Carthagena they manufacture a large quantity of the "eſparto" ropes and cables, ſome of which are ſpun like hemp, and others platted. Theſe cables are excellent, as they float on the ſurface of the water, and are not therefore liable to be cut by the rocks on a foul coaſt. The eſparto ruſh makes good mats for houſes, "alpargates" for peaſants, and has lately been ſpun into fine thread for the purpoſe of making cloth. This ruſh, it is ſaid, is the peculiar and natural production of all the high and uncultivated mountains in the ſouth, and affords in the dry and elevated regions, where neither hemp nor flax will grow, materials proper for clothing, and for the employment of induſtry. The moſt important production of this country, and the moſt valuable article of commerce is barilla, uſed for making ſoap, for bleaching, and for glaſs. The country producing it is about ſixty leagues in length, and eight in breadth, on the borders of the Mediterranean. The quantity exported annually from Spain is about 150,000 quintals, paying a duty of 17 reals per quintal. The chief imports are bale goods and bacalao; the latter directly from Newfoundland; and of the former muſlins and cottons are prohibited, though they are ſecretly introduced in great quantities. The ſoil of the adjacent country is loamy, compoſed of calcareous matter, ſand, and clay, from the diſſolution of the neighbouring mountains, which conſiſt of ſchiſtous rock covered with limeſtone. In ſome places is found the ſiliceous grit or ſand-ſtone, with ſhingle or ſmooth gravel and ſea-ſhells; and at no great diſtance from the city is a mountain, from which they obtain the gypſum uſed for plaſter. The whole country abounds with ſalt-petre. Oxen are uſed for draught; but in tillage they employ mules and aſſes. Their courſe of huſbandry is wheat, barley, and fallow. They ſow their wheat in November, and in July reap from 10 to 100 for one, according to the wetneſs of the ſeaſon. They grind all their corn by wind-mills, 30 of which may be counted near the city; and water for common uſe is ſcarce and dear. The trees moſt common in the adjoining valley are elms, poplars, olives, figs, pomegranates, mulberries, apricots, palms, palmitos, and the ginjolero; the laſt of which bears a ſmall fruit reſembling, in ſize and form, the olive, with a ſmaller kernel, and remarkably ſweet. The palmitos is the *chamærops humilis*. The moſt endemical diſeaſes at Carthagena are intermittent and putrid fevers, which ariſe from the proximity of an extenſive ſwamp, containing many hundred acres. The municipal government of Carthagena is veſted in a military governor, with his alcalde mayor; 30 regidores, whoſe office paſſes by inheritance, if not previouſly ſold; and two ſyndics choſen by the people as their peculiar guardians. The governor is the ſupreme and independent judge for the army, and for ſtrangers ſettled in the country, while his alcalde preſides in the tribunal for the citizens. In conſequence of the vicious formation of the government and the mal-adminiſtration of the laws, murder and aſſaſſinations are frequent in Carthagena, and the moſt atrocious villains eſcape puniſhment. Want of fidelity to matrimonial engagements is equally prevalent at Carthagena, as in the other provinces of Spain. N. lat. 37° 37′. W. long. 1° 8′ 30″. Townſend's Journey through Spain, vol. iii.

This city was founded in the year of Rome 525, (B. C. 229.) by Aſdrubal, the Carthaginian general, in order to ſecure the ſubjection of the country. It was taken by Scipio Africanus in the year of Rome 542 (B. C. 212.), after the defeat of Hannibal under the walls of Carthage in Africa. It became a Roman colony in the time of Cæſar, who eſtabliſhed a colony in it after the battle of Munda, and was one of thoſe denominated "conventus;" its juriſdiction extending over 65 towns. After having been deſtroyed by the Goths, it was rebuilt by Philip II. Diamonds, rubies, amethyſts, and other precious ſtones were formerly found in its vicinity, ſo that it was reckoned the Indies of the Romans; and it was famous for its ſilver mines. Strabo (l. iii. p. 148.) mentions a mine near this city, which yielded daily 25,000 drachms of ſilver, or about 300,000l. a year.

Carthagena, a province or government of South America, in the country of Terra Firma, the juriſdiction of which reaches eaſtward to the great river of de la Magdalena, and along this river ſouthward, till, winding away, it borders on the province of Antioquia; from thence it ſtretches weſtward to the river of Darien; and from thence northward to the ocean, along the coaſts between the mouths of theſe two rivers. The extent of this government from eaſt to weſt is generally computed at 53 leagues; and from ſouth to north 85. In this ſpace, beſides mountains and foreſts, are ſeveral fruitful vallies, called by the natives Savannahs; as thoſe of Zamba, Zenu, Tolu, Mompox, Baranca, and others; and in them many ſettlements, large and ſmall, of Europeans, Spaniſh creoles, and Indians. According to an exiſting tradition this country formerly abounded in gold, but the old mines are now either neglected, or exhauſted. But the riches of the country were principally owing to the trade which it carried on with Choco and Darien; from whence were brought, in exchange for this metal, the ſeveral manufactures and works of art which were needed. Gold was ſo plentiful, that it was the common ornament of the Indians, both men and women. The country, more eſpecially about the capital, is ſo luxuriant, that the trees and plants which it ſpontaneouſly produces preſent to view a rich and perpetual verdure; and the interwoven branches of the trees form a ſhelter impenetrable both to heat and light. The trees are large and lofty, very various, and altogether different from thoſe of Europe. The principal, with regard to ſize, are the caobo or acajou, of which they make their canoes and champanes for fiſhing, the cedar both white and reddiſh, the maria, and the balſam tree, which two laſt, beſides the utility of their timber, diſtil the admirable balſams called maria oil and balſam of Tolu, ſo called from a village, where it is found moſt excellent and moſt abundant. Beſides theſe trees, here are alſo the tamarind, the medlar, the ſapote, the papayo, the guayabo, the caſſia, the palm, the mançanillo, and ſeveral others, moſt of which yield a wholeſome and palatable fruit, as well as a durable and variegated wood. In the woods about Carthagena is found a great quantity of bejucos, of different magnitude, figure, and colour; one ſpecies of which is particularly noticed on account of its fruit, called "habilla de Carthagena," or the bean of Carthage, which is conſidered as one of the moſt effectual antidotes which that country affords againſt the bites of vipers and ſerpents. See Hippocratea. This country alſo abounds with various animals, both tame and wild. The only tame eatable animals are the cow and the hog, which are very plentiful. Wild geeſe and other poultry are good and very abundant. There are alſo different kinds of game, as deer, rabbits, and wild boars, called ſajones; but theſe are eaten only by the country negroes and Indians, except the rabbits, which find a good market in the city. The wild beaſts are tigers, leopards, foxes, armadillos, ſquirrels, and monkies, the ſmalleſt and the moſt common of which are the micos. The birds are incalculably numerous, and their various plumage is exquiſitely beautiful and brilliant. The moſt ſingular are the guacamayo, beautiful beyond expreſſion in plumage, but no leſs diſagreeable for its croaking noiſe, the tulcan, or preacher, and the gallinazos, which latter are of great ſervice in cleaning the city of all filth and ordure, by devouring dead animals, &c. Bats are very common, and they are ſo numerous at Carthagena, that when they begin to fly, they may be ſaid to cover the ſtreets like clouds. Among the inſects and reptiles, the principal are the ſnakes, the centipeds, the ſcorpions, and ſpiders.

The conſtant moiſture and heat of this climate will not allow the cultivation of wheat, barley, and other grains of that kind; but maize and rice are produced in great abundance. Of the maize they make a kind of bread, called bollo, which is generally uſed; and they alſo uſe it in feeding hogs and fattening poultry. The caſava bread, made from the roots of yuca, names, and moniatos, is very common among the negroes. Plantations of ſugar-canes are ſo general, as to reduce the price of honey; and part of the juice is converted into ſpirit. Cotton-trees are alſo in part ſpontaneouſly produced, and others, which are the beſt, are planted and cultivated. The cacao trees of Carthagena excel thoſe of the Caracas and neighbouring diſtricts both in the ſize and goodneſs of the fruit. Beſides melons, grapes, oranges, dates, and fruits which belong to other countries, Carthagena has ſome more appropriate to itſelf, ſuch as the pine-apple, the plantane, the banana, the papayas, &c. The chief town of this country is "Carthagena."

Carthagena, a city and ſea-port of South America, and metropolis of the province above deſcribed. It is ſeated on a peninſula, or ſandy iſland, which is joined to the continent by two artificial necks of land, the broadeſt of which is not above 70 yards wide. The fortifications are regular and ſtrong, and conſtructed after the modern manner. At a ſmall diſtance from the ſuburb, called Xexemani, ſeated on an iſland, and connected with the city by a wooden bridge, is a hill, on which is conſtructed a fort called St Lazaro, that commands both the city and ſuburb. The height of the hill is between 20 and 21 toiſes, and it is joined to ſeveral higher hills, which run off in an eaſtern direction. Theſe terminate in another hill of the height of 84 toiſes, on the top of which is a convent of bare-footed Auguſtines. The city and ſuburbs are well laid out; the ſtreets being ſtraight, broad, uniform, and well paved. The houſes are moſtly built of ſtone; they conſiſt chiefly of only one ſtory above the ground-floor; and the apartments are well contrived. All the houſes have balconies of wood, which is more durable in this climate than iron. Carthagena has ſeveral churches and convents; and, including its ſuburbs, it is equal to a city of the third rank in Europe. It is well peopled: the number of its inhabitants, moſt of whom are deſcended from the Indian tribes, being eſtimated at 25,000. The governor reſides in the city, and in civil affairs, an appeal lies to the audience of Sta. Fé; and when in 1739 a vice-roy of Sta. Fé was created under the title of vice-roy of New Granada, the government of Carthagena became alſo ſubject to him in military affairs. Carthagena has alſo a biſhop, whoſe ſpiritual juriſdiction is of the ſame extent as the military and civil government. The eccleſiaſtical chapter is compoſed of the biſhop and prebends. There is alſo a court of inquiſition, whoſe power extends to the three provinces of Iſla Eſpanola, where it was firſt ſettled, Terra Firma, and Santa Fé. Beſides theſe tribunals, the police and adminiſtration of the city are conducted by a ſecular magiſtracy, conſiſting of regidores, from whoſe number are annually choſen two alcaldes. There is alſo an office of revenue, under an accomptant and treaſurer, where all taxes and royal revenues are received, and whence the proper iſſues are directed. A perſon of the law, under the title of "auditor de la gente de Guerra," determines proceſſes.

The bay, which we ſhall more particularly deſcribe in the ſequel of this article, and the country before called "Calamari," were diſcovered in 1502 by Roderigo de Baſtidas; and in 1504, Juan de la Coſa, and Chriſtopher Guerra began the war againſt the Indian inhabitants, who, being a martial people, and joined by their women in the fatigues and dangers of war, reſiſted them with a valour and obſtinacy which they did not expect. Their common arms were arrows, which they poiſoned with the juice of certain herbs, ſo that the ſlighteſt wounds were fatal. They were ſucceeded by Alonſo da Ojeda, attended by Juan de la Coſa, as his chief pilot, and Americo Veſpucio, a celebrated geographer of thoſe times; but they met with ſimilar reſiſtance, and made little impreſſion. Nor was Gregorio Hernandez de Oviedo more fortunate. At length, the conqueſt of the Indians was accompliſhed by don Pedro de Heredia, who, after gaining ſeveral victories over them, ſubjected this part of America to the crown of Spain in 1533. The advantageous ſituation of Carthagena, the extent and ſecurity of its bay, and the great ſhare it acquired of the commerce of that ſouthern continent, ſoon cauſed it to be erected into a biſhop's ſee. The ſame circumſtances contributed to its preſervation and increaſe, as the moſt eſteemed ſettlement and emporium of the Spaniards; but they alſo drew upon it the attention and hoſtilities of foreigners, who have ſeveral times, with a view to its wealth and importance, invaded, taken, and plundered it. Its chief importance is derived from its harbour, which is the ſafeſt and beſt fortified of any in the American dominions of Spain. In a ſituation ſo favourable, commerce ſoon began to flouriſh; and as early as the year 1544, it ſeems to have been a town of ſome note. At this period, ſoon after its eſtabliſhment, it was invaded by ſome French adventurers, conducted by a Corſican pilot. In 1585 it was pillaged and almoſt deſtroyed by ſir Francis Drake; but happily reſcued from the flames by a ranſom of 120,000 ducats, paid him by the neighbouring colonies. It was again invaded and pillaged by the French in 1597, under the command of M. de Pointis, with an armament, conſiſting of Flibuſtiers, or Buccaneers, little better than pirates, but as ſubjects to the king of France, they were under his protection. After obliging the fort of Bocca Chica to ſurrender, ſo that the entrance of the bay was laid open, fort Lazaro was beſieged, and this was followed by the ſurrender of the city. But though the town capitulated, avarice conſigned it to pillage. At a later period, viz. in 1741, an expedition againſt Carthagena was undertaken by the Engliſh, and the conduct of it entruſted with admiral Vernon, who commanded the fleet, and general Wentworth, who conducted the land force. When the Engliſh, after encountering many difficulties, got poſſeſſion of the harbour, neceſſary diſpoſitions were made for gaining the town; but here they failed; and the officers thought it better to retire with their fleet and army than to ſtay longer in a country, the unwholeſome climate of which was infinitely more to be dreaded than the utmoſt efforts of its timid inhabitants.

When Carthagena was choſen as the port, in which the galeons ſhould firſt begin to trade on their arrival from Europe, and to which they were directed to return, in order to prepare for their voyage homeward, the commerce of its inhabitants was ſo much favoured by this arrangement, that it ſoon became one of the moſt populous, opulent, and beautiful cities in America. On the arrival of the galeons, Carthagena was the mart to which the inhabitants of the neighbouring provinces reſorted; and the merchants of Sta. Fé, Popayan, and Quito, not only diſpoſed of all their ſtock, but alſo laid out all the money entruſted by commiſſion for ſuch goods as were moſt wanted in their reſpective countries. They brought gold and ſilver in ſpecie, ingots, and duſt; and alſo emeralds, the demand for which was then conſiderable, though it has ſince decreaſed. Afterwards, during the interval between the departure and the arrival of the galeons, the trade of Carthagena was wholly confined to the towns and villages within its juriſdiction, from whence the inhabitants were ſupplied with all the neceſſaries of life in exchange for European commodities. Carthagena, however, we may well imagine, has reached its higheſt point of exaltation; and it muſt have been ſo far affected by the change that has taken place in the Spaniſh ſyſtem of trade with America, which has withdrawn from it the deſirable viſits of the galeons, as to feel at leaſt a temporary decline. But the wealth, now collected there, muſt find or create employment for itſelf, or may be turned with advantage into ſome new channel. Its harbour is ſo ſafe, and ſo conveniently ſituated for receiving commodities from Europe, its merchants have been ſo long accuſtomed to convey thoſe into all the adjacent provinces, that it is probable they will ſtill retain this branch of trade, and Carthagena continue to be a city of great importance.

Carthagena bay, to which the importance and proſperity of this city has been chiefly owing, is one of the beſt, not only on this coaſt, but alſo in all the known parts of this country. It extends 2½ leagues from north to ſouth, has a ſufficient depth of water and good anchorage, and is ſo ſmooth that the ſhips are no more agitated than on a river, though the numerous ſhallows at the entrance render it neceſſary to ſecure a good pilot. The entrance into the bay is through the narrow ſtrait of Bocca Chica, or Little mouth, which, ſince the invaſion of the Engliſh, has been ſhut up, and a more commodious one opened and fortified. Towards Bocca Chica, and 2½ leagues diſtant ſeaward, there is a ſhoal of gravel and coarſe ſand, having in many parts of it not more than a foot and a half of water. This bay abounds with great variety of fiſh, ſuch as the ſhad, &c. The turtles are large and well taſted. But it is very much infeſted with ſharks, which are very dangerous to ſeamen both in the water, and even in their boats.

The inhabitants of Carthagena and its adjacent territory may be diſtributed into different caſts, or tribes, who claim their origin from a coalition of whites, negroes, and Indians. The whites may be divided into two claſſes, viz. the Europeans and Creoles, or whites born in the country. The former are commonly called "Chapetones," moſt of whom, when they have acquired a competent fortune, return to Spain, or remove into inland provinces in order to increaſe it. Thoſe who are ſettled at Carthagena carry on the whole trade of the place, and live in opulence; whilſt the other inhabitants are indigent, and obliged to recur to hard and mean labour for a ſubſiſtence. The families of the white Creoles compoſe the landed intereſt; and many of them have large eſtates. Others, however, are in mean circumſtances. Among the other tribes, which are derived from an intermarriage of the whites with the negroes, the firſt are the "Mulattos;" next to theſe are the "Tercerones," produced from a white and a Mulatto; after theſe follow the "Quarterones," proceeding from a white and a Terceron; and the laſt are the "Quinterones," who owe their origin to a white and Quarteron. The children of a white and Quinteron are called Spaniards, and conſider themſelves as totally exempt from all taint of the negro race. Between the ſeveral tribes, or caſts above enumerated, there are other intermediate claſſes, formed of an intermixture of the former. The ſeveral caſts from the Mulattos affect the Spaniſh dreſs, but wear very ſlight ſtuffs, on account of the heat of the climate; and they compoſe the mechanics of the city. The claſs of negroes conſiſts of the free and the ſlaves; and theſe are again ſubdivided into Creoles and Bozares, ſome of whom are employed in the cultivation of the lands belonging to the city. On account of the extreme heat, the only covering both of the males and females is a ſmall piece of cotton ſtuff about their waiſt. The dreſs of the whites, both men and women, differs very little from that worn in Spain. The whole exerciſe of the females in the houſe conſiſts in ſitting in their hammocks, made of twiſted cotton, and commonly knit in the form of a net, and ſwinging themſelves for air. Thus they paſs the greateſt part of the day; and men, as well as women, often ſleep in theſe hammocks. Of both ſexes it is remarked, that they poſſeſs a conſiderable ſhare of wit and penetration, and of a genius adapted to excel in all kinds of mechanic arts. But their faculties ſeem to attain an early maturity, and they retain them in a great degree of vigour to an advanced age. The females of every caſt are diſtinguiſhed by a mild and amiable diſpoſition, and by the promptitude with which they relieve the indigent and diſtreſſed. The principal cuſtoms, in a great degree prevalent to this place, are the uſe of brandy, chocolate, honey, ſweatmeats, and ſmoaking of tobacco; and the latter practice is common among perſons of all ranks and of both ſexes. One of the moſt favourite amuſements of the natives is a ball, or "fandango," which, among the populace, conſiſts principally in drinking brandy and wine, intermixed with indecent and ſcandalous motions and geſtures. Their burials are conducted with great pomp and oſtentation; and their lamentations over the dead are attended with the moſt frantic geſtures and the moſt clamorous vociferations. The mourning is continued in the houſe of the deceaſed for nine days after the corpſe has been laid in the grave.

The climate of Carthagena is exceſſively hot; the degrees of heat being continually the ſame as that of the hotteſt day at Paris. The nature of this climate is chiefly manifeſted from the month of May to the end of November, the ſeaſon here called winter; during which time, there is almoſt a conſtant ſucceſſion of thunder, rain, and tempeſts; and the rain deſcends in ſuch quantities, that the ſtreets appear like rivers, and the country like an ocean. This is the only opportunity which the inhabitants have for filling their ciſterns with freſh water; the water of their wells being thick and brackiſh. From the middle of December to the end of April the rains ceaſe, and the weather is agreeable; the heat being ſomewhat abated by the N.E. winds, which then ſet in. This ſeaſon they call ſummer; beſides which they have another ſummer of ſhort continuance about the feſtival of St. John. The invariable continuance of great heats occaſions ſuch profuſe perſpiration, that the complexion of the inhabitants appears wan and livid, and all their motions are ſluggiſh. Yet upon the whole, they enjoy a good ſtate of health, and commonly live even to 80 years and upwards. The ſingularity of the climate occaſions diſorders of a peculiar kind: ſome of which attack the Europeans upon their firſt landing; and the others are common both to Creoles and Chapetones. Thoſe of the firſt kind are rapid in their progreſs, and terminate fatally when they bring on the black vomit. The inhabitants of Carthagena and its territory are very ſubject to the leproſy, in order to ſtop the contagion of which they have, without the city, a hoſpital called "San Lazaro," from the hill on which it ſtands, and in which perſons of both ſexes, labouring under this diſtemper, are confined. Another very ſingular diſtemper is the cobrilla, or little ſnake, which is a kind of tumour, which moſt commonly affects the arm, thigh, or leg; and which they cure by firſt applying a ſuppurative plaiſter, and fomenting the whole tumour with oil, and then faſtening a thread of ſilk to a kind of white fibre, that diſcovers itſelf, called the cobrilla's head, and winding the other end of it about a card, rolled up like a cylinder: they repeat the fomentation with oil, and the following day continue to wind about the cylindric card the part of the ſmall fibre, which appears in ſight, and thus proceed till the whole is extracted, and the patient cured. N. lat. 10° 26′ 35″. W. long. 75° 26′ 45″. Juan and d'Ulloa's Voyage to South America, by Adams, vol. i.

CARTHAGINIANS, in *Ancient Hiſtory*, are ſuppoſed to have derived their origin from the Canaanites. See CANAAN and CANAANITES. They were called by the Greeks, ſometimes Libyans, on account of the country they poſſeſſed; and ſometimes Phœnicians, on account of the country from which they were originally deſcended. The Romans ſtyled them Pœni, or Phœnicians, for the ſame reaſon; and every thing belonging to them, or their city, Pœnic, or Punic, that is Phœnician, or belonging to the Phœnicians. Between the Phœnicians and Carthaginians there always ſubſiſted the ſtricteſt union. To this purpoſe Herodotus informs us (lib. iii.) that when Cambyſes had determined to make war upon the latter, the Phœnicians, who formed the chief ſtrength of his fleet, poſitively declined to ſerve him againſt their countrymen; and on this account he was obliged to lay aſide his deſign. The Carthaginians, on their part, were never forgetful of the country from which they derived their origin. Accordingly, we learn from Polybius and Quintus Curtius, that they regularly ſent every year to Tyre a ſhip freighted with preſents, as a quit rent or acknowledgment paid to their ancient country; and its tutelar gods had an annual ſacrifice offered to them by the Carthaginians, who conſidered them as their protectors. They never failed to ſend thither the firſt-fruits of their revenues, and alſo the tythe of the ſpoils taken from their enemies, as offerings to Hercules, one of the principal gods of Tyre and Carthage. The Tyrians, on the other hand, when they wiſhed to ſecure their wives and children from Alexander, who was beſieging their city, ſent them to Carthage, where they were kindly received and hoſpitably entertained.

The *language* of the Carthaginians muſt at firſt have been the Phœnician; and this was the ſame with that of the Canaanites or Iſraelites, that is, the Hebrew, or at leaſt a language wholly derived from it. In proceſs of time, however, conſidering their diſtance from Phœnicia, their mother-country, and their intercourſe with other nations, their original tongue would be ſubject to ſome variation; and yet, notwithſtanding theſe variations, it ever continued to be the ſame in ſubſtance with the Hebrew or Phœnician. In the latter ages the Punic tongue acquired a tincture of the Chaldee and Syriac. As the iſland of Malta was, for a conſiderable time, ſubject to the Carthaginians, the Punic tongue muſt have long remained in it; and it appears, that about the middle of the 16th century, there were ſome pillars in the iſland, which had Punic inſcriptions upon them, and ſo late as that period the Punic tongue was ſpoken in Malta. The Punic letters, as well as language, muſt certainly at firſt have been the Phœnician; and though time produced a change in them, yet they always retained a great reſemblance of their original, as the curious inſpector may diſcern in the characters that are found upon the moſt elegant Phœnician and Punic coins.

The firſt *government* ſettled at Carthage was probably monarchical; but it expired either with Dido, or during her life, and was changed into a republic. Ariſtotle ſays, that it was partly ariſtocratical, and partly political, that is, democratical. According to Polybius, it was compoſed of monarchy, ariſtocracy, and democracy. But Iſocrates repreſents the civil government as oligarchical, and the military as monarchical. Ariſtotle, who intimates, that the Cretan, Lacedæmonian, and Carthaginian republics were the moſt perfect of any in the world, gives the preference, in ſeveral reſpects, to the Carthaginian. Of its excellent conſtitution it has been alleged, as a ſtriking evidence, that, notwithſtanding the great authority veſted in the people at Carthage, no inſtance occurred, from the foundation of the city to his time, of any popular commotions ſufficient to diſturb the public tranquillity, nor of any tyrant, who had been able, at the expence of liberty, to introduce oppreſſion. Hence, it has been inferred, that the three principal powers, of which the conſtitution of Carthage was compoſed, were of ſuch a nature as to counterpoiſe one another, and by their mutual harmony, to preſerve the public tranquillity and promote the public happineſs. Theſe were the ſuffetes, the ſenate, and the people. The ſuffetes, *ſophetim*, ſignifying, with the Hebrews and Phœnicians, judges, were two in number, of equal dignity and power, and the chief magiſtrates of Carthage. They correſponded to the two kings of Lacedæmon, as well as to the Roman conſuls: and hence they are ſometimes called kings and conſuls. They were annually elected out of the nobleſt families, and preferred on account of their virtue and talents, as well as their wealth. It was their province to aſſemble the ſenate, in which they preſided, to propoſe ſubjects for deliberation, to tell the number of voices, and to ſuperintend all emergent and deciſive debates. Their authority was not limited to the city, nor confined to civil affairs, as they ſometimes had the command of armies. Their concurrence with the ſenate in all points was neceſſary, in order to prevent any debate from coming before the people. Some ſay that they had the power of life and death, and that it was their prerogative to puniſh all ſorts of crimes. Moſt cities of note in the Carthaginian dominions, as well as the metropolis, had their ſuffetes, or chief magiſtrates. When their employment expired, they were made prætors; and this was an office of conſiderable authority and influence.

The ſenate was compoſed of perſons venerable for their age and experience, as well as illuſtrious for their birth, riches and merit. This honour was conferred upon them by election; but their number is not known. It was probably a numerous body, becauſe we find that 100 were ſelected from the ſenate to inquire into the conduct of their generals. This was the grand council of ſtate, in which every thing relating to peace and war, negociations and alliances, trade and navigation, in ſhort, to all affairs of moment, foreign or domeſtic, was debated, and, for the moſt part, determined. If the votes of the ſenate were unanimous, they had the force of laws, and from hence there lay no appeal. If they were divided among themſelves, or diſagreed with the ſuffetes, the affair was referred to the people, who had the liberty to expreſs their ſentiments freely, and of contradicting even the other parts of the legiſlature. What ſhare of power belonged to the people, whilſt the conſtitution remained in its moſt perfect ſtate, does not appear. But it is probable, that they had a vote in the election of magiſtrates, and in the enacting of laws, particularly ſuch as concerned themſelves. In the time of Ariſtotle, the republic verged towards popular government; though the ſenate ſtill retained a conſiderable degree of authority, and the power of the people was not uncontroulable; but about 100 years after, in the time of Hannibal, the ſenate was diſregarded; the people arrogated to themſelves almoſt the whole power; and ambitious demagogues obtained a very pernicious influence. From this period the public affairs were tranſacted by cabals and factions; the reputation and proſperity of the ſtate began to decline; and this circumſtance Polybius aſſigns as one of the chief cauſes of the ruin of Carthage.

The centumvirate, or tribunal of 100, conſiſted of 104 perſons, correſponding to the Ephori of Sparta, and formed a tribunal, which was intended to balance the power of the nobles and ſenate; it ſerved particularly to counteract the machinations of Mago, the Carthaginian general, and thoſe of his family, who, by engroſſing the chief employments of the ſtate and army, had acquired the ſole direction and management of all affairs. Of theſe 104 judges, five had a juriſdiction ſuperior to that of the reſt: and they had a power of filling all vacancies in their own body, and of chuſing thoſe perſons who compoſed the tribunal of the hundred; under the ſuffetes, they were at the head of this tribunal, and upon them, in a great meaſure, depended the life, fortune, and reputation of all the citizens. None were elected into this office but perſons of very diſtinguiſhed merit; and it had no ſalary or reward annexed to it. The centumvirate was, probably, a perpetual office till the time of Hannibal, who cauſed a law to be paſſed, which required all the judges to be choſen annually, and that none ſhould continue in office beyond that term. This took place about 200 years after the firſt eſtabliſhment of the tribunal of 100. The principal, if not the only, civil officers, eſtabliſhed at Carthage, beſides the ſuffetes, were the prætor, who had great influence in paſſing and repealing laws, and to whom was committed the charge of the public revenues; the quæſtor, who belonged to the bench of judges, who collected and managed the public money under the quæſtor; and the cenſor, whoſe buſineſs was to inſpect the manners of the citizens.

The *religion* of the Carthaginians, as they were deſcended from the Tyrians, agreed at firſt in all points with that of the Phœnicians. But by their intercourſe with the Greeks, they were led to adopt ſeveral new deities before unknown, and to blend ſome of the religious ceremonies of the Greeks with the Tyrian. Beſides, by their extended commerce, they became acquainted with the various kinds of ſuperſtition eſtabliſhed in other nations, which of courſe would give a tincture to their own; and hence it happened, that the religion of Carthage was a very groſs and multifarious idolatry. It may be alſo preſumed, that the Greek and Roman writers, in tranſmitting to us the hiſtory of theſe people, and of the objects of their worſhip, would affix the names of their own gods to thoſe of the Carthaginians. The principal deity at Carthage was Chronus, or Saturn, to whom were offered in ſacrifice children of the moſt diſtinguiſhed families. We read that upon the ſignal defeat of the Carthaginian army by Agathocles, 300 citizens voluntarily ſacrificed themſelves in order to render him more propitious to their country. This deity had a brazen ſtatue with extended arms, ſo diſpoſed that a child preſented to it dropped down into a hollow where was a fiery furnace. This deity, from various circumſtances, appears to have been the Moloch or Milchem of Scripture, the famous idol of the Ammonites, Canaanites, and neighbouring nations. This is ſuppoſed to have been alſo the ſame god with the Baal, Bel, or Belus of the Sidonians, Babylonians, and Aſſyrians. The goddeſs Cæleſtis, or Urania, was held in the higheſt veneration by the Carthaginians. This is ſuppoſed to have been the deity called by the prophet Jeremiah, (vii. 18. xliv. 17.) Baaleth Shemaim, the queen of heaven; by Megaſthenes, in Euſebius, Beltis; by Sanchoniatho, Dione and Baaltis; and by Heſychius, Belthes, which name was applied both to Juno and Venus. St. Auguſtin informs us, that Venus eſtabliſhed her reign at Carthage; and Virgil ſays, that Juno preferred that ſpot to all others. Aſhteroth and Aſtarte were ſynonymous to Urania and Baaltis, and denoted the moon as well as Venus and Juno, who was invoked in great calamities, particularly in droughts, to obtain rain. Jupiter was worſhipped by the Carthaginians under the name of Belus or Baal (ſee BAAL); Mars alſo was dignified by the ſame title; and ſo were likewiſe Bacchus and Apollo or the ſun. Baal-ſamen, or Baal-ſhemaim, that is, the god of heaven, appears to have been the ſun, and Beliſama, or the queen of heaven, the moon. The Carthaginians introduced Ceres and Proſerpina as Greek deities, and alſo Mercury, who received divine honours under the name of Aſumes or Aſoumes. The worſhip of the Tyrian Hercules was brought to Carthage by Dido, and diffuſed itſelf afterwards over all the coaſts of Africa, and as far as Gades or Cadiz, where he had a magnificent temple. Beſides other honours that were rendered to him at Carthage, he was annually gratified with human victims. Jolaus, as the relation of Hercules, was honoured as an object of veneration at Sardinia, which iſland was for a conſiderable time in the poſſeſſion of the Carthaginians. The Dea Syria, or Syrian goddeſs, who is ſuppoſed to have been either Juno, or a group of all the goddeſſes, was a deity of the Carthaginians. The people of Carthage likewiſe addreſſed themſelves to

Æſculapius, who had a ſpacious temple in the fortreſs of Byrſa. Herebus, another Carthaginian deity, is ſuppoſed to have been Pluto, or Dis. Triton, the ſea-god, had alſo a place among the deities of Carthage. Mopſus, a famous ſooth-ſayer, had temples erected to his honour by the Carthaginians, and reſponſes were iſſued from them, as from ſo many oracles. Rivers, meads, and waters, or rather the genii that preſided over them, were objects of adoration with theſe people; and as the old Africans paid a religious homage to fire, this was probably the cuſtom alſo at Carthage. The air and winds likewiſe ſhared divine honours. The ſiſter of Dido paſſed for a goddeſs, under the name of Anna Perenna; Dido herſelf received ſimilar honours after her death, and Ovid ſays, that in her life time ſhe procured it for her huſband Sichæus. Tellus, or the earth, was worſhipped by the Carthaginians. Moreover, it is not unlikely that the Carthaginians adopted their famous generals, ſuch as Hamilcar, Hannibal, and others, into the number of their gods; and that theſe were deities of the ſame kind with the dii indigetes of the Latins. The Carthaginians alſo ranked among their gods the two Philæni, who, for the purpoſe of extending the territory of Carthage, conſented to be buried alive in the place which they had pitched upon for its boundary. Portable temples were in uſe among the Carthaginians; which were covered chariots that carried ſmall images repreſenting certain gods. The tabernacle of Moloch, mentioned in ſcripture, is thought to have been a machine of this kind. The Cabiri were likewiſe adored at Carthage (ſee CABIRI); and alſo the Anaces, Anactes, or Dioſcuri. The gods, called Patæci, had the ſame reſpect from their votaries the Phœnicians and Carthaginians as the Penates had from the Romans. The cuſtom of offering human ſacrifices to theſe gods continued in Carthage till the ruin of their city; nor did it ceaſe among the Africans till the proconſulate of Tiberius; who ordered the prieſts concerned in this horrid impiety to be hanged. We may obſerve, in general, that the Carthaginians were extremely addicted to ſuperſtition; and yet they ſeemed to be influenced by ſome good principles; for it was their cuſtom to addreſs themſelves to the gods before they attempted to execute any enterpriſe, and, after having gained any advantage, they made proper acknowledgment to ſuperior powers.

In this connection it may not be improper to ſay ſomething on the *character* of the Carthaginians. As they were intent upon amaſſing wealth, they were mean-ſpirited, groveling, and ſordid, to an incredible degree. This at leaſt ſeemed to have been their diſpoſition towards the decline of their ſtate, though in their earlier ages they were of a ſuperior turn of mind, and even to the laſt, they had ſome perſons among them who poſſeſſed generous and heroic ſpirits. In forming an opinion of theſe people, we ſhould remember, that their character is tranſmitted to us chiefly by the Romans, who were their avowed and implacable enemies; and who took care to deſtroy not only the Punic archives, but every record of Punic literature, or of true hiſtory. Of the Carthaginian perfidiouſneſs and ingratitude, their hiſtory will furniſh abundant proof. Craft and cunning, which, according to Cicero, were the diſtinguiſhing characteriſtics of the Carthaginians, naturally led to falſehood, hypocriſy, and breach of faith, and theſe terminated in the baſeſt frauds and the moſt perfidious actions. Theſe qualities of the Carthaginians were ſo notorious, that, to ſignify any remarkable diſhoneſty, it was uſual to call it "Punic Honour," "Fides Punica;" and to denote a knaviſh, deceitful mind, no expreſſion was thought more proper than "Ingenium Punicum," a Carthaginian mind. Plutarch deſcribes them as actuated by a moroſe, saturnine, and ſavage diſpoſition; utterly averſe from every thing that had the leaſt appearance of wit or raillery. Some of them were vain, arrogant, and ambitious to a very high degree, and, indeed, avarice and ambition ſeemed to be with many of them ruling paſſions.

As commerce, the army, and the marine, were the principal objects of attention at Carthage, and as theſe engaged the purſuits and engroſſed the thoughts of the people in general, we cannot expect to find that they ſhould have cultivated any very diſtinguiſhed taſte for the liberal *arts and ſciences*. However, they muſt have been acquainted with the rudiments of aſtronomy, without which they could not have been tolerably verſed in the art of navigation. They had ſome notion likewiſe of ſculpture and painting, as we may learn from the ſtatues of their dii patæci, which they carried with them in their voyages, and from the pictures with which their ſhips of war and other veſſels were adorned. They muſt alſo have made a conſiderable proficiency in the inferior mechanical arts; as we may undeniably conclude from their ſuperb temples, magnificent palaces, rich furniture, and great variety of arms, and domeſtic utenſils. Their records of literature were deſtroyed by the Romans; nevertheleſs, the names of their principal writers have been tranſmitted with honour to poſterity. Hannibal, it is ſaid, was well acquainted with the Greek, and wrote ſeveral pieces in this language. Mago, another celebrated Carthaginian general, compoſed 28 volumes upon huſbandry, which, after the taking of Carthage, were held in ſuch high eſtimation by the Roman ſenate, that they ordered them to be tranſlated into Latin. Philinus, who wrote a hiſtory of the wars betwixt the Romans and the ſtate of Carthage, is reckoned by Polybius a good though a partial hiſtorian; but no part of his work is extant. Himilco, a ſea-officer, who was deputed by the ſenate of Carthage to diſcover the weſtern ſhores and ports of Europe, wrote a journal of his voyage, together with an account of his diſcoveries. Hanno, another Carthaginian general, ſailed, by order of the ſenate, along the coaſt of Africa. Having entered the ocean through the ſtraits of Gibraltar, he arrived firſt at the iſland of Cerne, ſuppoſed to be the modern iſle of Arguim, which became the chief ſtation of the Carthaginians on that coaſt; proceeding thence he reached a promontory, which he called the "Weſt Horn," probably Cape Palmas; and from this he advanced to another promontory, which he named the "South Horn," which is the preſent Cape de Tres Palmas, about 5 degrees N. of the line. He wrote a relation of his voyage, and a Greek fragment of it is ſtill remaining; the authenticity of which ſome have doubted. See AFRICA.

Among other inventions aſcribed to the Carthaginians, that of the quadriremes, or four-oared gallies, deſerves mention; and it is not improbable, that they were the firſt who made cables of the ſhrub "ſpartum" (ſee CARTHAGENA); at leaſt they were the firſt who communicated this invention to the Romans. Their navigation was extended to all the ports of the Mediterranean, both to the eaſt and to the weſt; Britain and the Canaries are ſaid to have been known to them; the weſtern coaſt of Africa they were acquainted with to a conſiderable extent, as we have already obſerved; and ſome have aſſerted, but without ſufficient evidence, that their nautical ſkill had led them to traverſe the ocean and to viſit the coaſt of America. They were, however, without doubt, for a long time univerſally acknowledged maſters of the ſea. It muſt be allowed, that, with the exception of thoſe already mentioned, to whom we may add Clitomachus the philoſopher, called in the Punic language Aſdrubal, and the celebrated poet Terence, who was born at Carthage, the Carthaginians could not boaſt of their men of literature and ſcience; although they had a correſpondence with Greece and the moſt civilized nations, their views were directed to trade; nor do they ſeem to have had any emulation to avail themſelves of their learning. Eloquence, poetry, philoſophy, and hiſtory ſeem to have been little known among them; and the education of youth, though Carthage was provided at an early period with an excellent ſchool, muſt have been very much neglected. The knowledge that was principally ſought and valued was reſtricted in a conſiderable degree to writing, arithmetic, book-keeping, and the buying and ſelling of goods; ſo that it was ſubordinate to traffic. In the latter years of their ſtate the laws forbade any Carthaginian to learn the Greek tongue, leſt it might qualify him for carrying on a dangerous correſpondence with the enemy, either orally or by letter.

After all, *commerce*, independently of the wars in which they were engaged, muſt occupy the chief place in the hiſtory of the Carthaginians. This formed the greateſt ſtrength and chief ſupport of their commonwealth, and we may venture to affirm, that the power, the conqueſts, the credit, and glory of the Carthaginians, all flowed from trade. From their Tyrian progenitors they inherited their genius for commerce, and in proceſs of time eclipſed the glory of their anceſtors, inſomuch that Pliny derives the origin of trade, not from the Phœnicians, but from the Pœni or Carthaginians. The natural fertility of its ſoil, the ſurpriſing ſkill of its artificers, and its peculiarly happy ſituation for commerce, rendered Carthage the centre of traffic, the great mart, not only of the Mediterranean, but even of the moſt remote nations. Without contending for the trade of the eaſt with their mother-country, they extended their navigation chiefly towards the weſt and north. Following the courſe which the Phœnicians had opened, they paſſed the ſtraits of Gades, and viſited not only all the coaſts of Spain, but thoſe of Gaul, and penetrated at laſt into Britain. They alſo extended their reſearches towards the ſouth, and planted along the weſtern coaſt of the great continent of Africa ſeveral colonies, in order to civilize the natives, and accuſtom them to commerce. They made conſiderable progreſs, by land, into the interior provinces of Africa, traded with ſome of them, and ſubjected others to their empire. The commodities with which they ſupplied other countries, ſeem to have been corn and fruits of all kinds; divers ſorts of proviſions, and high ſauces; wax, honey, oil, and the ſkins of wild beaſts, all the natural produce of their own territories. Their ſtaple manufactures were utenſils, toys, cables, all kinds of naval ſtores, and the colour from them called Punic, the preparation of which ſeems to have been peculiar to themſelves. From Egypt they fetched fine flax and paper; from the coaſts of the Red Sea, ſpices, frankincenſe, perfumes, gold, pearls, and precious ſtones; from Tyre and Phœnicia, purple and ſcarlet, rich ſtuffs, tapeſtry, coſtly furniture, and various artificial curioſities; from the weſtern parts of the world, in return for the commodities carried thither, they imported iron, tin, lead, and copper. By thus purchaſing the ſuperfluities of all nations, with which they had intercourſe, at an eaſy price, and ſelling them at an advanced rate, they brought immenſe treaſures to Carthage, rendered this republic formidable to her neighbours, and enabled her to contend with Rome itſelf for the empire of the world.

The gold and ſilver mines of Spain furniſhed the Carthaginians with an inexhauſtible ſource of wealth. Polybius, quoted by Strabo, ſays, that in his time upwards of 40,000 men were employed in the mines near Nova Carthago, and ſupplied the Romans, at a ſubſequent period, every day with 25,000 drachmas, or 859l. 7*s.* 6d. ſterling. Beſides, the Carthaginians carried on, by means of their caravans, an annual intercourſe with the Perſians, Garamantes, and Ethiopians; and brought from theſe remote nations, together with other rich commodities, carbuncles of ineſtimable value; which gems, from the plenty of them at Carthage, were called by the ancients Carchedonian or Carthaginian. We may add, that no profeſſion was more honourable than that of the merchant in the dominions of this ſtate; nor is this any wonder, when we conſider the numberleſs advantages that accrued from it. Herodotus (lib. iv.) mentions a ſingular mode of carrying on traffic between the Carthaginians and the Libyans, who bordered on the ſea-coaſts, beyond the ſtraits or pillars of Hercules. After they had run into ſome creek, they landed their goods, and leaving them expoſed on a point of land, returned on board their ſhips. They then cauſed a great ſmoke to be raiſed, at the ſight of which the Libyans came to the ſpot where the wares had been left, and laying down a quantity of gold, retired to a diſtance. The Carthaginians went on ſhore a ſecond time, and if the gold appeared to them ſufficient, they carried it off and ſailed without delay; if not, they remained quiet on board their ſhips for ſome time. The Libyans, finding they were not ſatisfied, made an addition to what they had before depoſited; and they continued increaſing the quantity of gold, till the Carthaginians were ſatisfied and the bargain made. Neither of theſe nations offered the leaſt injuſtice to the other. The Carthaginians did not touch the Libyan gold till it was of equal value with their wares; nor did the Libyans meddle with the Carthaginian merchandiſe till the gold they offered as an equivalent was accepted and taken away. A ſimilar mode of traffic ſeems to ſubſiſt among the Bedas of Ceylon. See BEDAS.

In order to ſketch out the hiſtory of the Carthaginians, as our limits will not admit of a minute detail, we ſhall diſtribute the duration of their ſtate, which, according to Appian, was 700 years, and which others make 746 years, but which we ſhall lay down, conformably to the teſtimony of Cato, ſanctioned by Solinus, at 737 years, into three diſtinct periods or epochas. The firſt commences with the foundation of Carthage, in the year 883 B. C. and extends to the invaſion of Sicily, in the year 480 B. C.; comprehending an interval of 403 years. The ſecond extends from this invaſion to the rupture with the Romans, in the year 264 B. C. or the commencement of the firſt Punic war, being an interval of 216 years. The third period laſted 118 years, during which the three Punic wars occurred; the firſt continued 24 years, from the year 264 B. C. to 241 B. C.; the ſecond continued 17 years, from the year 218 B. C. to 201 B. C.; and the third continued 4 years, from the year 149 B. C. to 146 B. C. when Carthage was deſtroyed.

The *firſt period*, according to the above diſtribution, is imperfectly known. We have already ſtated (ſee CARTHAGE) that Eliſa, known by the name of Dido, fled from Tyre in the 7th year of the reign of Pygmalion, king of that city, and landing on the coaſt of Africa, founded either the city of Carthage, or at leaſt the citadel of Byrſa. For 300 years after the tragical death of Dido, there is a chaſm in the hiſtory of the Carthaginian ſtate. During this period their whole attention ſeems to have been engaged in the extenſion of their commerce, and in forming eſtabliſhments, with this view, in various parts of the world. It appears that at a very early period this republic had made conſiderable acquiſitions in Sicily and Sardinia, and other places; and that it was formidable by ſea in the time of Cyrus and Cambyſes. This latter prince, in the 6th year of his reign, was obliged to abandon an expedition which he had projected againſt the Carthaginians, becauſe the Phœnicians would not ſuccour him; and hence it appears, that the whole naval power of the Perſian empire was unable to contend with that of Carthage, without the aſſiſtance of the Tyrians. In the year 508 B. C. the year after the regiſage, the Carthaginians concluded a treaty with the Romans, chiefly relating to navigation and commerce; and they were the firſt people out of Italy with whom the Romans entered into an alliance. From this treaty, which was ſigned 28 years before Xerxes invaded Greece, we learn, that the whole iſland of Sardinia, and part of that of Sicily, were then ſubject to the Carthaginians. At this time they were well acquainted with the coaſts of Italy; and they manifeſted on various occaſions a jealouſy of the enterpriſing ſpirit and growing power of the Romans; nor would they permit them to ſail beyond the promontory called the "Fair Promontory," lying to the north of Carthage, leſt they ſhould diſcover the fertility of the land, as well as the favourable ſituation of the cities, and be tempted to make a ſettlement. Under Mago, a Carthaginian general of conſummate abilities and merit, and who is ſaid to have firſt introduced military diſcipline among the ſoldiery, the dominions of Carthage were much enlarged, its commerce extended, its riches increaſed, and virtue alone was countenanced both in the army and the ſtate. He left the country in the moſt flouriſhing condition, and was ſucceeded in his high employments by his ſons Aſdrubal and Hamilcar. To them was committed the command of the army againſt Sardinia, which had revolted, and in the war that was proſecuted on this occaſion, Aſdrubal was mortally wounded. His death was much lamented by the Carthaginians. About this time the Carthaginians, determined to ſhake off the African yoke, by diſcontinuing the tribute which, by their original contract, they were obliged to pay, declared war; but being unſucceſsful, it was terminated by a treaty, the chief article of which required, that the tribute as at firſt impoſed upon them for the ground on which the city ſtood, ſhould be continued. In proceſs of time, however, the tribute was aboliſhed. It was about this time that Darius Hyſtaſpis, king of Perſia, ſent an embaſſy to Carthage, requiring the inhabitants to abſtain from human ſacrifices, and from eating dog's fleſh; to burn their dead, and not to bury them, as had been the uſual practice; and to furniſh him with a body of auxiliary forces to ſerve in the war which he had declared againſt Greece. With the laſt article the Carthaginians did not think proper to comply, becauſe their troops were otherwiſe engaged. Towards the cloſe of Darius's reign, it ſeems probable that an offenſive and defenſive league was formed betwixt theſe two powers; however, it is certain, that an alliance was entered into between Xerxes, the ſucceſſor of Darius, and the ſtates of Carthage: and that the Carthaginians engaged to invade Sicily with all their forces, and endeavour to drive the Greeks from thence, as well as the continent of Italy, whilſt that prince marched in perſon, with the whole ſtrength of the Perſian army, againſt Greece itſelf. The firſt ſettlement of the Carthaginians in Spain muſt have preceded the period of which we are now ſpeaking; and it is moſt probable that the nerves of their power were the mines of Spain, by which they were enabled to equip ſuch powerful fleets and collect ſuch formidable armies; and that, by their aſſiſtance, they made ſuch extenſive conqueſts in Sicily and Africa. But, though the firſt Carthaginian ſettlement in Spain muſt have preceded the reigns of Xerxes and Darius, and even that of Cyrus, and have occurred when the city of Gades, now Cadiz, was in its infancy, yet we learn from Livy and Polybius, that the greateſt part of Spain remained unſubdued till the wars of Hamilcar and Hannibal. Diodorus Siculus informs us, that the Carthaginians ſent a colony into the iſland Ebuſus, or Ereſus, now Yvica, 160 years after the foundation of their city; and it is highly probable, that about this time the Balearic iſlands, now called Majorca and Minorca, were likewiſe either planted or reduced by the ſame people, and that they were furniſhed by theſe iſlands with the moſt expert ſlingers in the world, who did them great ſervice in their battles and ſieges. See Baleares *Inſulæ*. To this period alſo it is reaſonable to refer the firſt deſcent of the Carthaginians in Spain. As Sardinia was in the poſſeſſion of the Carthaginians when they made their firſt treaty with the Romans, we are warranted in concluding that Corſica, ſeparated from the former by a ſtrait of about 3 leagues in breadth, was poſſeſſed by them, either wholly or in part, in very ancient times; and Herodotus expreſsly informs us, that the Cyrnians, or Corſicans, were one of thoſe nations which enabled the Carthaginians to form that great army, with which they invaded Sicily, in the days of Gelon.

After the concluſion of the treaty with Xerxes, already mentioned, the Carthaginians, in purſuance of their engagements, made great preparations for war againſt the Greeks of Sicily, both by ſea and land. This brings us to the *ſecond period* of the hiſtory of Carthage, which commenced with the year 481 B. C. The preparations for this expedition laſted 3 years, and large ſums of money were ſent by Xerxes from Perſia to aſſiſt the Carthaginians in completing them. When every thing was ready, Hamilcar, the ſon of Hanno, according to Herodotus, but of Mago, according to Juſtin, was appointed to the command; and he ſailed from Carthage with 300,000 men, compoſed of different nations, and a fleet of above 2000 ſhips of war, with 3000 tranſports, not doubting to make an entire conqueſt of Sicily in the firſt campaign, B. C. 480. Notwithſtanding an ominous diſaſter in the paſſage, by which the horſes and chariots of Hamilcar periſhed in a ſtorm, the general, on his arrival at Panormus, now Palermo, endeavoured to diſſipate the gloomy apprehenſions of his followers, by repreſenting the certainty of ſucceſs, and expreſſing his fear leſt the Sicilians, by reaſon of the ſtorm, would eſcape the danger that threatened them. Having laid ſiege to Himera, he was attacked by Gelon and Theron, the tyrants of Syracuſe and Agrigentum, with their united forces; and after a long and bloody conteſt, Hamilcar was ſlain, and the whole Carthaginian army either put to the ſword, or obliged to ſurrender at diſcretion. The Carthaginian fleet was likewiſe totally deſtroyed. The news of this defeat arrived at Carthage by one ſmall boat, the ſolitary remnant of their fleet; and produced lamentation and terror through the whole city. Such was the indignation which this diſaſter produced in the public mind againſt Hamilcar, that, notwithſtanding all his paſt ſervices, it was determined to make his family ſuffer; and therefore Giſco, his ſon, was baniſhed, and retiring to Selinus, he died there for want of neceſſaries. Gelon granted the Carthaginians peace on the following terms: that they ſhould pay two talents of ſilver towards defraying the expences of the war;—that they ſhould build two temples (one to Ceres and another to Proſerpine) where this treaty ſhould be depoſited, and at all times be expoſed to public view;—and that, for the future, they ſhould abſtain from human ſacrifices. From this time to the cloſe of the 92d, or beginning of the 93d olympiad, B. C. 409 or 408, the Carthaginians are ſcarcely mentioned in the Sicilian hiſtory; though during this interval they turned their arms againſt the Moors, Numidians, and other African nations, and greatly extended their frontiers in Africa; they alſo releaſed themſelves from the tribute which they had been accuſtomed to pay, and became abſolutely independent. They had likewiſe warm diſputes with the people of Cyrene, the capital of Cyrenaica, and after ſhedding much blood, accommodated their differences by the interpoſition of two brothers, called Philæni, who extended their territory, and conſented to be buried alive in the place fixed upon as their boundary. See Philæni. In the year B. C. 409, the Egeſtines, or Segeſtans, who had declared in favour of the Athenians, againſt the Syracuſans, dreading their reſentment, and being actually attacked by the people of Selinuntum, implored the aid of the Carthaginians; and for their more effectual ſuccour, Hannibal, one of the Suffetes, grandſon to Hamilcar, and ſon to Giſco, who had been exiled, was entruſted with the command of an army, conſiſting, as ſome ſay, of 200,000 foot and 4000 horſe, or, according to others, of about 100,000. Having captured Selinuntum, or Selinus, with circumſtances of peculiar barbarity, and alſo Himera, he returned to Carthage, laden with ſpoils, and was received with loud and joyful acclamations. The Carthaginians, elated with this ſucceſs, meditated the reduction of the whole iſland of Sicily; and in the year B.C. 406, they deputed Hannibal, aided, on account of his age and infirmities, by Imilcar, or Imilcon, the ſon of Hanno, with a large fleet and army, for this purpoſe. The campaign was opened with the ſiege of Agrigentum, which, after a vigorous reſiſtance, was taken and plundered, and laid in ruins. See AGRIGENTUM. Gela and Camarina ſhared the ſame fate. This war was terminated by a treaty with the tyrant Dionyſius; after which Imilcar, whoſe army had been much weakened by the caſualties of war, and by the plague, which had broke out in it, returned to Carthage, where this diſorder made dreadful havock, as it alſo did in other parts of Africa.

Dionyſius, having by the fore-mentioned treaty gained time for eſtabliſhing his authority at Syracuſe, began his preparations for renewing the war with the Carthaginians; and when he had fortified the city and completed his naval and military arrangements, he communicated his deſign to the Syracuſans, which was that of inſtantly attacking the Carthaginian territories, without a previous declaration of war. Accordingly in the year 397, B.C., he commenced hoſtilities, by abandoning to the fury of the populace the perſons and the poſſeſſions of the Carthaginians who reſided at Syracuſe, and traded on the faith of treaties. This example of perfidiouſneſs and barbarity was followed throughout the whole iſland of Sicily. Having thus begun, he diſpatched a herald to Carthage, with a meſſage to the ſenate and people, requiring them to withdraw their garriſons from all the Greek cities in Sicily, and threatening them, on refuſal, with treating all the Carthaginians that were found in them as enemies. This intelligence occaſioned a general alarm through the city, which the plague had already reduced to a very miſerable condition. But the Carthaginians, though alarmed, were not intimidated; nor did they loſe any time in preparing for defence, and in collecting an army, the command of which they conferred on Himilco. Dionyſius, without waiting for their reply, put his army in motion, and opened the campaign with the ſiege of Motya, which was the magazine of the Carthaginians in Sicily; and after a long and obſtinate reſiſtance, the city was taken by ſtorm, and all the inhabitants put to the ſword, thoſe excepted who took ſanctuary in the temples. Himilco, unable to prevent its capture, returned to Africa; but in the following year he was appointed one of the ſuffetes, and returned to Sicily with a far greater army than before. He landed at Panormus or Palermo, took ſeveral cities, and recovered Motya by force of arms. Animated by theſe ſucceſſes, and alſo by the capture of Meſſina, he advanced towards Syracuſe, with a deſign of beſieging it; marching his infantry by land, whilſt his fleet, under the command of Mago, ſailed along the coaſt. His army conſiſted, as ſome ſay, of 300,000 foot, and 3000 horſe, or as others ſay, 30,000 foot, and his fleet of 200 ſhips, and 500 barks. Whilſt he was making progreſs in the ſiege, a contagious diſtemper made dreadful havock among his troops. Dionyſius availed himſelf of this favourable opportunity for attacking the Carthaginian forces; whilſt moſt of the ſhips were either taken or burnt, great ſlaughter was committed in the Carthaginian camp; and Himilco, by a private capitulation with Dionyſius, and for the ſum of 300 talents (54,000l. according to ſome, or by another eſtimate 61,800l.) obtained permiſſion to depart in the night, with all the ſurviving citizens of Carthage, to Africa. The remainder of his army was left to the mercy of the conqueror. The Carthaginians received intelligence of this diſaſtrous event with inexpreſſible grief and conſternation; and Himilco, unable to ſurvive his misfortune, and bewailing his own fate and that of his country, put an end to his own life. The news of Dionyſius's ſucceſs induced the Africans to revolt from the Carthaginians, whom they naturally hated, and againſt whom they were now particularly incenſed for having ſaved only their own citizens, and for having left the confederates to the mercy of the enemy. Accordingly an army of 200,000 effective men was ſoon collected; and having taken Tunis in their march, they advanced towards Carthage; but, deſtitute of experienced commanders, and unaccuſtomed to military diſcipline, they were ſoon obliged to diſperſe, and Carthage was delivered from one of the moſt imminent dangers that ever threatened it. Notwithſtanding the great loſſes which the Carthaginians had ſuſtained in the courſe of this war, which laſted about five years, they could not forbear making new attempts upon the iſland of Sicily; and an army of 80,000 men was committed to the conduct of Mago. Although he gained many advantages, he found himſelf in an enemy's country, and diſtreſſed for want of proviſions, he thought it moſt prudent to conclude a treaty of peace with Dionyſius, and to return to Carthage. For nine years after this peace the Carthaginians ſeem to have enjoyed uninterrupted tranquillity; but in the ſecond year of the 99th olympiad, B. C. 383, Dionyſius, meditating a war againſt them, formed a project for improving his finances, that he might be enabled to carry it on with ſucceſs. The Carthaginians, appriſed of his intentions, ſtrengthened themſelves by alliances with their neighbours, and adopted all other neceſſary meaſures for ſelf-defence. After ſome alternate ſucceſſes and defeats, Mago, the Carthaginian general, and ſon of the former general, who loſt his life at the battle of Cabala, concluded a peace with Dionyſius upon condition of his ceding to the Carthaginians the city and territory of Selinus, as well as that part of the diſtrict of Agrigentum, bordering on the territory of Selinus, and extending as far as the river Halycus, and alſo of his paying them 1000 talents towards defraying the expences of the war. Between three and four years after the concluſion of this war, (B. C. 378,) Carthage ſuffered much from the plague, which ſwept away a very great number of its inhabitants. The Africans and Sardinians took the advantage of it, and made ſome attempts for throwing off a yoke which was hateful and grievous; but their efforts were ineffectual, and they were ſoon reduced to their former allegiance. Towards the beginning of the 103d olympiad (B. C. 368) Dionyſius, emboldened by the weakened ſtate of Carthage, formed an enterpriſe in Sicily, which was unſucceſsful and terminated in a truce; but he did not long ſurvive this event. This truce was changed by his ſon and ſucceſſor, Dionyſius II., into a perpetual peace. Soon after this time, A. U. C. 402, (B. C. 352) the Carthaginians concluded a ſecond treaty with the Romans, nearly of the ſame tenor with the firſt, excepting that the inhabitants of Tyre and Utica were expreſsly comprehended in it, and joined with the Carthaginians. After the death of the elder Dionyſius, Syracuſe was involved in great troubles; and Dionyſius, the reigning prince, was under a neceſſity of quitting his throne, and continuing 10 years in exile; but he was afterwards reſtored, and found means to reinſtate himſelf in his dominions. However, his temper was ſavage and brutal, and he exerciſed great cruelties among his ſubjects. This ſeemed a favourable opportunity for the Carthaginians to make themſelves abſolute maſters of Sicily; and accordingly they equipped a large fleet, and entered into an alliance with Icetas, tyrant of the Leontines, who had taken Syracuſe under his protection. The two powers engaged, by this treaty, to unite their forces in order to expel Dionyſius; and, after his expulſion, to divide Sicily between them. The Syracuſans, diſcovering this deſign, applied to the Corinthians for aſſiſtance; who ſent over Timoleon, a general of conſummate abilities, and an ardent friend to liberty, with a body of troops to their aſſiſtance. Accordingly, in the year B. C. 345, he ſet ſail from Corinth for Sicily with 10 ſhips and 1000 ſoldiers, and purſuing his voyage over the Ionian ſea, he arrived ſafely, with his ſmall fleet, at Metapontum, on the coaſt of Italy. From thence he advanced to Rhegium, where, by a happy ſtratagem, he eluded the vigilance of the Carthaginians, and landed his forces at Taurominium in Sicily. Timoleon, with his ſmall force, advanced boldly to the relief of Syracuſe; and made his way into one part of the town before the enemy had any notice of his approach. Here he defended himſelf with ſuch reſolution that he could not be diſlodged by the united powers of Icetas and the Carthaginians. Dionyſius, having ſurrendered the citadel to Timoleon, with all the forces, arms, and ammunition in it, eſcaped, by his aſſiſtance, to Corinth: and a diſſatisfaction having taken place among Mago's ſoldiers, in conſequence of an artful repreſentation made by the emiſſaries of the Corinthian general, that it was aſtoniſhing to ſee Greeks, who formed a great part of the Carthaginian army, uſing their endeavours to make barbarians maſters of Sicily, from whence they would, in a very little time, paſs over into Greece; Mago himſelf, wanting a pretence to retire, intimated that his forces were about to betray and deſert him, and, therefore, ſailed with his fleet out of the harbour, and ſteered for Carthage. Icetas could not maintain his poſition againſt the Corinthians; and thus they got poſſeſſion of the whole city. Mago, on his arrival at Carthage, was impeached; but he prevented the execution of the ſentence paſſed upon him, by a voluntary death. The Carthaginians, with a view of repairing the loſſes they had ſuſtained, levied new forces, and ſent to Sicily a greater and more powerful fleet than the former. It conſiſted of 200 ſhips of war, beſides 1000 tranſports; and the army amounted to upwards of 70,000 men. They landed at Lilybæum; and Timoleon, with 7000 men, marched out to meet them. Of the 4000 mercenaries, which compoſed his ſmall army, a thouſand deſerted upon the march to the river Crimeſus or Crimiſa, on the banks of which the enemies were encamped: and yet, with perfect confidence in the valour of his own ſoldiers, he was determined to hazard a battle. The event juſtified his expectation; the Carthaginians were completely routed; more than 10,000 fell on the field of battle, of whom 3000 were Carthaginian citizens, and 2500 formed what was called the ſacred cohort, ſo that this event filled their city with mourning and conſternation. Their camp was taken; and with it immenſe riches, and a great number of priſoners. This memorable battle was fought on the 27th day of the month Thargelion (June 13th) B. C. 340. It was followed with a treaty of peace, between Timoleon and the Carthaginians, which ſtipulated that all the Greek cities ſhould be declared free; that the river Halycus or Lycus ſhould be the boundary between the territories of both parties; that the natives of the cities ſubject to the Carthaginians ſhould be allowed to withdraw, if they pleaſed, to Syracuſe, or its dependencies, with their families and effects; and that Carthage ſhould not for the future afford any aſſiſtance to the remaining tyrants againſt the Syracuſans. It was about this time that Hanno, an opulent and powerful citizen of Carthage, formed a deſign of ſubverting the conſtitution, and introducing arbitrary power. With a view to the accompliſhment of this project, he propoſed to invite the ſenators to a grand feaſt made on occaſion of his daughter's marriage: and by mixing poiſon with wine to deſtroy them all; not doubting but ſuch a tragical event would at once make him maſter of the republic. The plot was diſcovered, but Hanno's intereſt in the city was ſo great, that the government could not venture to puniſh him, even for ſo execrable a crime. Hanno, finding that his firſt ſtratagem was defeated, had recourſe to arms, and collected together all his ſlaves for the execution of his purpoſe. This plot was alſo diſcovered. In order to avoid merited puniſhment, he retired with 20,000 armed ſlaves to a caſtle that was ſtrongly fortified, and from thence ſought the aſſiſtance of the Africans, and of the king of Mauritania; but when all his projects had failed, he was taken priſoner, and carried to Carthage; where, after being ſeverely ſcourged, his eyes were put out, his arms and thighs broken; and at laſt he was executed in the preſence of all the people, and his body was ſuſpended on a gibbet. His children and all his relations, though they had not participated his guilt, ſhared his puniſhment. They were all ſentenced to die, that not a ſingle perſon of his family might ſurvive, either to imitate his crime or to revenge his death. It was probably about this period, or ſomewhat later, that the Tyrians ſent ambaſſadors to Carthage, to implore aſſiſtance againſt Alexander, but being incapable of ſending them any ſuccour, they diſpatched 30 of their principal citizens to Tyre, to condole with them on this afflictive occaſion, and to expreſs their concern, that the bad ſituation of their own affairs would not permit them to ſpare any troops. The Carthaginians themſelves, when they heard of Alexander's progreſs in the Eaſt, began to entertain apprehenſions for their own ſafety; and deputed Hamilcar, or as Gellius ſays, Aſdrubal, ſurnamed Rhodanus, a perſon of wonderful addreſs and eloquence, to wait upon that prince; and having been introduced to him by means of Parmenio, he ſo far inſinuated himſelf into his favour, as to have the honour of attending him in all his future expeditions. Having obtained this degree of confidence with Alexander, he did ſignal ſervice to his country, by communicating many important diſcoveries relating to the conqueror's ſchemes. Although the treachery of this Carthaginian eſcaped the diſcovery, or even the ſuſpicion of Alexander, he was, after his return to his own country, notwithſtanding all his ſervices, conſidered as a betrayer of his country, and was accordingly put to death at Carthage, by a ſentence as barbarous as it was ungrateful. About the year 319 B. C. Agathocles, a Sicilian, of obſcure birth and low fortune, roſe into notice; and ſupported at firſt by the power of the Carthaginians, he invaded the ſovereignty of Syracuſe, and made himſelf tyrant over it. In the infancy of his power, the Carthaginians kept him within bounds, and Hamilcar, their chief, forced him to agree to a peace, which reſtored tranquillity to Sicily. But he ſoon infringed the ſtipulated articles of it, and declared war againſt the Carthaginians themſelves, who under the conduct of Hamilcar, obtained a ſignal victory over him, near Himera, in the year B. C. 310, and forced him to ſhut himſelf up in Syracuſe. The Carthaginians purſued him thither, and laid ſiege to that important city; and if they could have taken it, they would have gained poſſeſſion of all Sicily. Agathocles, finding himſelf deſerted by his allies from an abhorrence of his cruelties, formed a moſt daring, and to appearance, an impracticable ſcheme, of transferring the war to Africa, and inveſting Carthage, at a time when he himſelf was beſieged, and had only one city left in Sicily. His profound ſecreſy in the execution is no leſs aſtoniſhing than the deſign itſelf. Without imparting his ſcheme to any confidential friend, he merely declared that he had diſcovered an infallible method of reſcuing the Syracuſans from the dangers that ſurrounded them; that ſome inconvenience would attend a ſhort ſiege; but that thoſe who choſe to eſcape, might freely leave the city. Sixteen hundred perſons quitted it; and all ſlaves who were able to bear arms were ſet at liberty, and joined his forces. With a ſtock of 50 talents for the ſupply of his preſent wants he ſet ſail with two of his ſons, without informing either of his followers whither he intended to direct his courſe. The Carthaginians endeavoured to prevent the departure of the fleet, but Agathocles eluded their purſuit, and made his eſcape to the main ocean. When he arrived in Africa, he communicated to his troops the deſign of this expedition and the motives that had prompted him to undertake it. The ſoldiers heard his ſpeech with acclamations; flattered themſelves with the proſpect of ſucceſs; and thought that they were already maſters of Carthage. As he approached the city, the inhabitants were alarmed, and could not help imagining that their army before Syracuſe had been defeated and their fleet loſt. After ſome deliberation, they reſolved to arm the citizens; and with 40,000 foot, 1000 horſe, and 2000 armed chariots, under the command of Hanno and Bomilcar, they marched to meet the enemy, whoſe force conſiſted of 13 or 14,000 men. The battle was obſtinate and bloody; at length Hanno and the ſacred cohort, who long ſuſtained the fury of the Greeks, were overwhelmed with a ſhower of ſtones, and the general fell, ſword in hand; while Bomilcar proved treacherous, retired with the army under his command, and left the field to Agathocles.

After this defeat, the Carthaginians determined to recal Hamilcar from Sicily; accordingly he raiſed the ſiege of Syracuſe, withdrew his troops from the place, and ſent a detachment of 5000 men to reinforce the troops in Africa. Hamilcar and his remaining forces were attacked by the Syracuſans; upon which, being deſerted by his army, which before the engagement amounted to 120,000 foot, and 5,000 horſe, he was taken priſoner and carried into Syracuſe. In the mean while Agathocles, having gained ſeveral advantages in Africa, was preparing to beſiege Carthage itſelf; and advancing to the camp of the Carthaginians which covered the city, he communicated to them the diſtreſſing intelligence of the total deſtruction of their army in Sicily. This news filled them with conſternation, and Carthage itſelf would have been loſt, if an unexpected mutiny had not occurred in the camp of Agathocles, which proved almoſt fatal to the tyrant himſelf, and gave the Carthaginians an opportunity of rallying and recovering ſtrength. This was followed by an indeciſive battle betwixt Agathocles and the Carthaginians, who had ſent an army to puniſh and reclaim Numidia, which had revolted. During theſe tranſactions, Bomilcar, who poſſeſſed the firſt employment in the ſtate, attempted to effect a revolution at Carthage, and to obtain the ſovereignty of that city, to which he had long aſpired. A dreadful maſſacre was the means by which this revolution was to be accompliſhed; but as ſoon as it was known that Bomilcar was the cauſe of this diſturbance, and that he had cauſed himſelf to be proclaimed king of Carthage, the indignation of the people was rouſed; the traitor was apprehended, and executed on a croſs in the middle of the forum; and thus the Carthaginians were reſcued from the moſt dangerous domeſtic enemy their ſtate had ever produced. Agathocles finding himſelf at the head of a numerous army, aſſumed the title of king of Africa, and propoſed ſoon to complete his conqueſts in that country by the reduction of Carthage. But after having taken Utica, he was diverted from his further progreſs by a commotion in Sicily, which required his preſence. His ſon Archagathus, with whom he had entruſted the command in Africa, was for ſome time ſucceſsful in extending his conqueſts; his career of victory, however, was interrupted by ſome deciſive advantages gained on the part of the Carthaginians; and it became neceſſary to ſummon Agathocles from Sicily. Upon his arrival in Africa, he took the earlieſt opportunity that occurred of attacking the Carthaginian camp, but met with a total defeat. This diſaſter, together with ſome other unfavourable circumſtances that happened, induced Agathocles to quit Africa. After his departure his two ſons were aſſaſſinated by the ſoldiers, (B. C. 285.) who, chuſing leaders from among themſelves, concluded a peace with the Carthaginians, which was in the following year ratified by Agathocles. The Carthaginians by this peace had all the cities reſtored to them, which they had formerly poſſeſſed in Sicily, and deriving this advantage from the termination of the war, they left Agathocles at liberty to purſue his deſigns in Sicily. Urged by his implacable hatred to the Carthaginians he prepared for a new war; but this, and other projects which he had formed, were fruſtrated by his death, B. C. 283. In the year, B. C. 280, Pyrrhus, king of Epirus, turned his arms againſt Italy; but before he landed, the Romans renewed their treaties with the Carthaginians, with an additional engagement of mutual aſſiſtance, if either of the contracting powers ſhould be attacked by this prince. Accordingly the Carthaginians, as ſoon as they heard of Pyrrhus's deſcent in Italy, ſent a fleet of 120 ſail under the command of Mago; who, in an audience before the ſenate, ſignified the concern with which his principals had heard of the hoſtilities of Pyrrhus, and offered, in the name of his republic, a body of auxiliary troops to enable them to repel their foreign invader. The ſenate returned thanks for this obliging offer of the Carthaginians; but at the ſame time declined accepting it. Some days after this interview with the ſenate, Mago repaired to Pyrrhus, on pretence of offering the mediation of Carthage for terminating his quarrel with the Romans; but the real motive of this viſit was to diſcover, if poſſible, what were his deſigns with regard to Sicily, which common fame reported he was going to invade. The Syracuſans, indeed, who had been for ſome time beſieged by the Carthaginians, had ſent preſſing intreaties for ſuccour to Pyrrhus. Accordingly he at laſt ſailed from Tarentum, paſſed the ſtrait, and arrived in Sicily. His conqueſts were at firſt ſo rapid, that he left the Carthaginians, in the whole iſland, only the ſingle town of Lilybæum. To this he laid ſiege, but finding a vigorous reſiſtance, and being ſummoned back to Italy, he gave up his deſign. Upon his departure, Sicily immediately returned to its former maſters; ſo that he loſt the iſland with the ſame rapidity that he gained it. As he was embarking, turning his eyes back to Sicily, he exclaimed, "what a fine field of battle do we leave to the Carthaginians and Romans!" and his prediction was ſoon verified. After his departure, Hiero was appointed prætor of Syracuſe and general of the Syracuſan army. Under his command, they obtained ſeveral advantages over the Carthaginians, and in a ſhort time became formidable to that republic. It was not long, however, before the Romans, who were extending their views beyond the boundaries of Italy, formed a reſolution of eſtabliſhing themſelves in Sicily; and this ſoon occaſioned a rupture between them and the Carthaginians, which was followed by the firſt Punic war:

and with this commences the *third period* in the hiſtory of Carthage.

The *firſt Punic war* commenced in the year, B. C. 264, and it aroſe from the following circumſtances. Some Campanian ſoldiers, who had belonged to the army of Agathocles, were kindly received at Meſſina, as they were leaving Sicily and embarking for their own country. But with an atrocious ingratitude and perfidy, they took occaſion, in the night, either to expel or aſſaſſinate all the men; after which they married their wives, ſeized their effects, and remained ſole maſters of that important city. After they had divided the land and riches of the inhabitants among themſelves, they called the city Mamertina, and aſſumed the name of Mamertini, that is, a martial or warlike people, from *Mamers*, a word which, in their language, ſignified *Mars*, the god of war. In imitation of their conduct, and by their aſſiſtance, a Roman legion treated in the ſame cruel manner the city of Rhegium, which lay directly oppoſite to Meſſina, on the other ſide of the ſtrait. Theſe two perfidious cities, concurring and mutually ſupporting each other, became formidable to their neighbours. Meſſina, in particular, being very powerful, gave great umbrage and uneaſineſs both to the Syracuſans and Carthaginians, who poſſeſſed one part of Sicily. The Romans, after the departure of Pyrrhus, determined to puniſh the revolters at Rhegium; and for this purpoſe they took the city, killed moſt of the inhabitants in the attack, and carried about 300, who ſurvived, to Rome, where they were ſcourged, and publicly beheaded in the forum. By this ſanguinary execution the Romans wiſhed to teſtify to their allies their own innocence and integrity. Rhegium was then reſtored to its lawful poſſeſſors. The Mamertines were thus conſiderably weakened; and while they were concerting means for their own ſafety, they diſagreed among themſelves, ſo that one party ſurrendered the citadel to the Carthaginians, and the other called the Romans to their aſſiſtance and reſolved to put them in poſſeſſion of their city. Thus commenced the firſt Punic war. Although the Roman ſenate declined to take part with the Mamertines, who had acted a treacherous and cruel part; the people were leſs ſcrupulous, and determined to aſſiſt them. With this view the conſul Appius Claudius croſſed the ſtrait with his army, and contrived to elude the vigilance of the Carthaginian general. The Carthaginians, partly by art and partly by force, were driven out of the citadel, and the city immediately ſurrendered to the conſul. The Carthaginians, having executed their general, prepared to beſiege the town with all their forces, which were alſo joined by thoſe of Hiero. The conſul, however, defeated them ſeparately, and having raiſed the ſiege, laid waſte the country. This was the firſt expedition, which the Romans made out of Italy. Hiero afterwards entered into an alliance with the Romans, which the Carthaginians were unable to prevent. The Carthaginians, thus deſerted by their ally, determined to make every poſſible effort for driving the Romans out of Sicily; but theſe efforts were ſo far from being effectual, that they loſt ſeveral towns, and particularly Agrigentum, which Hanno, commander in chief of all the Carthaginian forces, had made a place of arms, and his principal magazine. Notwithſtanding theſe acquiſitions, the Romans were well apprized, that as long as the Carthaginians retained the dominion of the ſea, it would not be in their power to drive them out of Sicily; and, therefore, they now formed the firſt deſign of having a fleet, and of diſputing with the Carthaginians the empire of the ſea. At this time they had not a ſingle veſſel, which they could call their own; but though they were deſtitute of experience in maritime affairs, they applied to them with ſuch ardour and induſtry, that in two months they built 100 five-oared, and 20 three-oared gallies; and after ſome time ſpent in exerciſing the rowers, their fleet put to ſea, under the command of the conſul Duilius, and ſailed in queſt of the enemy. The Romans coming up with the Carthaginians near the coaſt of Mylæ, prepared for an engagement; and availing themſelves of a grappling inſtrument, called *Corvus* or crow, they were able to board the enemies' ſhips and to come to a cloſe fight. The Carthaginian fleet conſiſted of 130 ſail, under the command of Hannibal. At firſt the Carthaginians deſpiſed their enemies; but when they ſaw the abovementioned engines raiſed on the prow of every one of their ſhips, and found that they were thrown forcibly into their veſſels ſo as to grapple them in ſpite of all reſiſtance, they were not a little aſtoniſhed. Being thus compelled to fight as if they had been on land, they were unable to ſuſtain the attack of the Roman veſſels, which produced a great ſlaughter among the Carthaginians, and the loſs of 80 veſſels. This unexpected victory raiſed the ſpirits of the Romans; and extraordinary honours were conferred on Duilius, as the firſt Roman to whom a naval triumph was decreed. After ſeveral maritime conflicts, in which ſometimes the Romans and ſometimes the Carthaginians were victorious, the advantage upon the whole was on the ſide of the former. Determined, however, to combat the Carthaginians in their own country, they both prepared for a deciſive engagement. The Roman fleet, conſiſting of 330 gallies, on board of which were about 140,000 men, was commanded by the conſuls L. Manlius Vulſo and C. Attilius Regulus, and rendezvouſed at Meſſina; and the Carthaginian ſquadron, compoſed of 350 ſail, and about 150,000 men, and commanded by Hanno and Hamilcar, after aſſembling at Lilybæum, took their ſtation at Heraclea Minoa. The two fleets at length came within view of each other, and made the neceſſary diſpoſitions for battle. The Roman ſquadron conſiſted of four diviſions; the firſt of which was ſtationed on the right and the ſecond on the left, and the third in the rear of the other two, ſo as to form a triangle, the vertex of which was compoſed of the two admiral gallies, in which were the conſuls, placed in the front of their reſpective ſquadrons. The triarians, forming the 4th diviſion, were drawn up in the rear of the whole fleet, parallel to the third diviſion, the baſe of the fore-mentioned triangle, but extending beyond the two angles. The tranſports, with the horſe and baggage on board, lay between the third diviſion and the triarians, this being the ſituation in which they would be moſt ſecure from any attacks of the enemy. The Carthaginians, having perceived the diſpoſition of the Roman ſquadron, immediately ranged their own in order of battle. They divided it into four ſmaller ſquadrons, which they drew up in one line. The three firſt diviſions, poſted to the right, ſtretched far into the ſea, as if they intended to ſurround the Romans, pointing their prows directly upon them; the 4th lying to the left, kept cloſe under ſhore, being diſpoſed in the form of an outwork or tenaille. Hanno commanded on the right, and Hamilcar on the left. In this action, which was conducted on both ſides with great ſkill and valour, the Romans loſt 24 gallies: but the Carthaginians, who were entirely defeated, had 30 ſunk, and 63 taken by the victors. After this battle, which happened near Heraclea Minoa, Hamilcar made propoſals of peace to the Romans, chiefly with a view of diverting them from the African expedition; but the Romans, rejecting the propoſal, carried on the war; and the conſuls, ſoon after ſailing for Africa, with their whole fleet, and a powerful army on board, landed at Clypea without oppoſition. Regulus with the forces under his command committed great ravages along the ſea-coaſts, and even penetrated into the heart of the country. Having laid ſiege to Adis, or Adda, a fortreſs of great conſequence to Carthage, the Carthaginians advanced to meet him; an encounter enſued, and the Carthaginians were defeated, with the loſs of 17,000 men, and 18 elephants. Regulus, after this action, burnt all the open places, and, as Eutropius informs us, conquered 73 towns. Utica and Tunis were both obliged to ſubmit, and nothing ſeemed now to remain but the ſiege of Carthage itſelf. To complete the misfortunes of the Carthaginians, the Numidians entered the territories of Carthage and committed ſuch dreadful devaſtations, that a famine ſeemed to be inevitable. The African nations likewiſe, more immediately ſubject to Carthage, being weary of the Carthaginian yoke, joined the Romans. Regulus, well knowing the diſtreſſed ſituation of the Carthaginians, offered to negociate a peace; but his terms were ſo humiliating, that the Carthaginians reſolved to ſuffer any extremities rather than ſubmit. Regulus and the Romans were become inſufferably arrogant, in conſequence of their ſucceſs; and after having deſolated the country, had advanced to the great moraſs, on which Carthage ſtood, reſolving, upon the rejection of his propoſals, to attack the capital of the African republic. At this moment of alarm and danger, Xantippus, a Lacedæmonian of great bravery and military ſkill, with a body of Greek mercenaries, arrived at Carthage. Having aſſumed the command of the Carthaginian forces, he taught them to form all the evolutions and movements of the military art, according to the Lacedæmonian manner. The Carthaginians, thus inſtructed and inſpirited, thought themſelves invincible under the conduct of Xantippus, who drew them up in order of battle in a large plain before the city, and boldly advanced towards the Romans. After calling a council of war, in deference to the Carthaginian commanders, it was reſolved to give the enemy battle on the following day. Regulus was become vain and ſelf-confident, and by his miſconduct occaſioned the total ruin of his army. Xantippus availed himſelf of the error which he committed, and either put to the ſword, or took priſoners, all, except 2000 men, who broke his right wing and made their eſcape to Clypea. Of the Carthaginians 800 were ſlain; and on the ſide of the Romans the number of thoſe who fell in the battle and purſuit muſt have been about 13,000. Xantippus took Regulus himſelf, and 500 of his men, priſoners in the purſuit, and immediately carried them to Carthage, where all, except Regulus, were treated with great humanity. Regulus had in his proſperity ſo inſulted the Carthaginians, that he is ſaid to have been confined in a dungeon, with ſuſtenance barely ſufficient to keep him alive, and a huge elephant, at the ſight of which animal he was always greatly terrified, was conſtantly placed near him. On this occaſion the Carthaginian army did not conſiſt of above 16,000 men, beſides the elephants; and therefore, conſidering the number and valour of the Roman legions, this was a wonderful victory, and juſtly attributed to the conduct and bravery of Xantippus. This battle was fought in the year, B. C. 256. The Romans were not diſcouraged; but in the following campaign they put to ſea with 360 veſſels, and in an engagement with the Carthaginians, who met them with 200, proved victorious, took 114 ſhips and ſailed to Africa in order to bring away the ſmall remnant of the army of Regulus. The Romans afterwards ſuſtained, by ſtorms and other occurrences, ſuch prodigious loſſes at ſea, that they entertained thoughts of declining all preparations for the future againſt the Carthaginians, and to leave them maſters of the ocean. However they were encouraged to renew their attention to maritime operations by ſome ſubſequent events of a more favourable kind; and arriving in Sicily with a fleet of 200 ſhips, they formed the bold deſign of beſieging Lilybæum, the ſtrongeſt town poſſeſſed by the Carthaginians on that iſland, the loſs of which would be attended with that of every part of it, and open to the Romans a free paſſage into Africa. In the proſecution of this ſiege the Romans encountered many loſſes and diſaſters, and were at length reduced to the neceſſity of turning the ſiege into a blockade, and of drawing a line round the place, to prevent the garriſon from receiving any ſuccours. The beſieged, on the other hand, repaired their works and determined to defend the town to the laſt extremity.

In the year B. C. 249, the conſul Claudius put to ſea with a powerful fleet in order to ſurpriſe Drepanum; but he was vanquiſhed by Adherbal, a Carthaginian admiral of great conduct and bravery. Claudius, with 30 veſſels, eſcaped out of the engagement to the camp at Lilybæum, with intelligence of this defeat; which was the greateſt ever ſuſtained by the Romans at ſea ſince the commencement of this war. In the conſulate of Lutatius Catulus and A. Poſthumius, B. C. 242, the Romans equipped a fleet of 200 veſſels, at the expence of private perſons; and the command was given to Lutatius. As the Carthaginian fleet had retired to Africa, the conſul ſeized all the advantageous poſts in the neighbourhood of Lilybæum, and prepared for an engagement, which he knew to be inevitable, by exerciſing his ſoldiers and ſeamen at ſea. As ſoon as he was informed that the Carthaginian fleet drew near, under the command of Hanno, he aſſembled all his beſt forces and ſailed for the ſmall iſland Œguſa, which lay near Eryx, whither Hanno propoſed to have repaired in order to obtain a ſupply for his army, and to reinforce his troops. The engagement commenced with great advantage on the ſide of the Romans, as their veſſels were much better equipped and manned than thoſe of the Carthaginians. They were, therefore, unable to ſuſtain the firſt attack. Forty of their veſſels were ſunk, and ſeventy taken with their whole crews. The reſt, favoured by a wind, which roſe very ſeaſonably for them, made the beſt of their way to Hiera, the little iſland, oppoſite to Drepanum, from which they had ſailed. There were upwards of 10,000 taken priſoners. Lutatius then advanced to the city of Eryx, where he engaged the Carthaginians, and cut off 2000 men. This laſt action concluded the operations of the firſt Punic war, in the year B. C. 241, after it had continued twenty-four years, and was followed by a peace, the terms of which were dictated by the victorious conſul. The treaty, though it adjuſts the intereſts both by ſea and land of two powerful republics and their allies, is compriſed in a ſmall compaſs, and very clearly and accurately expreſſed. "There ſhall be peace between Rome and Carthage (in caſe the Roman people approve of it) on the following conditions: the Carthaginians ſhall evacuate entirely all Sicily; and ſhall no longer make war upon Hiero, the Syracuſans, or their allies; they ſhall reſtore to the Romans, without ranſom, all the priſoners which they have taken from them; and pay them, within twenty years, 2200 Euboic talents of ſilver;" amounting to 515,000*l.* ſterling. When theſe conditions were brought to Rome, the people, diſapproving them, ſent ten commiſſioners to Sicily, to terminate the affair. Theſe made no alteration as to the ſubſtance of the treaty; but required that the time appointed for the payment of the ſum demanded ſhould be reduced to ten years; that 1000 additional talents ſhould be paid immediately; and that the

Carthaginians ſhould depart out of all the iſlands, ſituate between Italy and Sicily.

Soon after the concluſion of the war waged by the Carthaginians againſt the Romans, they were under a neceſſity of commencing another with their mercenary troops, who had ſerved under them in Sicily ; which has been commonly called the African or Libyan war. It was principally occaſioned by a neglect on the part of the Carthaginians in ſettling the arrears of their pay, or fulfilling the promiſes made to them by Hanno ; and although it laſted only three years and four months, terminating in the year, B. C. 238, it was uncommonly barbarous and bloody. Hanno, who was employed to negociate with them at Sicca, whither they had been compelled to retire, imprudently propoſed, that they ſhould be content with receiving only a part of the arrears due to them, and remit the remainder on account of the preſſing exigencies of the republic. This propoſal was heard with diſſatisfaction and murmur, which terminated in open rebellion. Accordingly about 20,000 of them marched towards Carthage, and encamped at Tunis, not far from that metropolis. No conceſſions now ſatisfied them ; but the ſeeming condeſcenſion of the Carthaginians was aſcribed to weakneſs and timidity. At length the ſettlement of this buſineſs was referred to ſome general of their own choice ; and as they ſelected Giſco, for whom they profeſſed great reſpect, he was employed to mediate between the contending parties. This general addreſſed them in mild and ſoothing language ; recalled to their memories the long time they had been in the Carthaginian ſervice, as well as the conſiderable ſums they had received from the republic ; and granted almoſt all their demands. When the treaty was almoſt concluded, two mutineers occaſioned a tumult in every part of the camp. Theſe were appointed chiefs of the furious multitude ; Giſco's tent was plundered of the money deſigned for the payment of the forces ; and the general himſelf, with his attendants, were dragged to priſon and treated with great indignity. All the cities of Africa, which they had ſolicited to join them in the recovery of their liberty, united with them ; except Utica and Hippacra, which they beſieged. Carthage had never been before this time in circumſtances ſo diſtreſſed and perilous. Every thing ſeemed to conſpire to its ruin. The citizens drew their ſubſiſtence from the rents or revenues of their lands, and the public expences from the tribute paid from Africa ; of which they were not only deprived at once, but it was employed againſt them. They were alſo deſtitute of arms and forces either for ſea or land ; they had made no preparations for ſuſtaining a ſiege, or equipping a fleet ; and, to complete their misfortunes, they had not the leaſt proſpect of receiving aſſiſtance from any foreign friend or ally. At the ſame time they had reaſon to reproach themſelves for numerous inſtances of oppreſſion and cruelty in their conduct towards the African nations. The Africans were therefore eaſily prevailed upon to engage in this rebellion ; and the women, whoſe huſbands and fathers had been dragged to priſon for non-payment of heavy tributes, were more exaſperated than the men, and were eager to deliver up all their ornaments towards the expences of the war. The Carthaginians, however, though deeply diſtreſſed, did not deſpond ; but exerted themſelves in levying troops and fitting out ſhips, the command of which was intruſted with Hanno. The army of the rebels had increaſed to 70,000 men, and whilſt they were beſieging the two cities already mentioned, their camp was pitched at Tunis, and Carthage was held in a kind of blockade. Hanno's firſt object was the relief of Utica ; but on account of ſeveral errors with which he was chargeable in the conduct of this buſineſs, he was ſuperſeded by Hamilcar Barcas. Hamilcar having obliged the rebels to raiſe the ſiege of Utica, marched againſt their main army, defeated part of it, and ſeized almoſt all their advantageous poſts. Being afterwards joined by a young Numidian nobleman, named Naravaſus, with 2000 of his countrymen, he fell upon the rebels, killed 10,000 of them, and took 4000 priſoners. Thoſe who ſurvived were treated with ſingular lenity. Spondius, the chief of the rebels, with a view of counteracting this clemency and preventing a deſertion among his troops, engaged them in a ſervice which would deprive them of all hopes of being reunited to the enemy ; and this was no other than the murder of Giſco, and about 700 of his comrades, who had been confined with him in priſon. The rebels alſo reſolved to treat all ſuch Carthaginians, who ſhould fall into their hands, in the ſame barbarous manner. Several circumſtances occurred at this time that ſerved to diſpirit the Carthaginians ; one of which was the revolt of Utica and Hippacra, the only cities which had uniformly preſerved their allegiance, and always adhered inviolably to the republic, even when Agathocles and the Romans had made their deſcents in Africa. A diviſion alſo took place among their generals, and Hannibal was deputed to ſuperſede Hanno. After Hannibal's arrival in the camp, the affairs of the Carthaginians took a favourable turn ; Hiero, king of Syracuſe, afforded them aſſiſtance ; and in a battle with the rebels, diſtreſſed by famine, and deprived of their chiefs who had been ſeized, 40,000 of them were cut to pieces. The conſequence of this victory was the reduction of almoſt all the cities of Africa, which immediately returned to their allegiance. Hamilcar, without loſs of time, marched againſt Tunis, which, ever ſince the beginning of the war, had been the aſylum of the rebels and their place of arms ; and Hannibal joined him in beſieging it. In order to ſtrike terror into the enemy, croſſes were ſet up near the walls, and Spondius was hung on one of them, and his companions who had been taken with him, on the reſt, and thus they all expired. Matho, the other chief of the rebels, who commanded in the city, ſaw what he had to expect, and became deſperate in his own defence. Perceiving Hannibal off his guard, through confidence of ſucceſs, he made a ſally, attacked his quarters, killed many of his men, took ſeveral priſoners, among whom was Hannibal himſelf, and plundered his camp. He then placed Hannibal on the croſs, in the room of Spondius, after having firſt made him to endure inexpreſſible torments, and ſacrificed around the body of Spondius, thirty citizens of the firſt quality in Carthage, as ſo many victims of his vengeance. When the news of this event reached Carthage, it cauſed great conſternation, and it was thought adviſable to make one grand effort. Accordingly, all the young perſons capable of bearing arms were preſſed into the ſervice. Hanno was ſent to join Hamilcar ; and thirty ſenators were deputed to conjure thoſe generals to forget paſt quarrels, and to ſacrifice their reſentments to their country's welfare. Their interpoſition was effectual ; the generals were reconciled ; and from this time the Carthaginians were ſucceſsful in all the meaſures which they adopted. Matho was eager to hazard a battle ; and when an engagement took place, victory did not long remain doubtful. The rebels gave way, the Africans were almoſt all ſlain, and the reſt ſurrendered. Matho was taken alive, and carried to Carthage, where he and his ſoldiers, after having adorned the public triumph, were led to execution, and finiſhed, by a painful and ignominious death, a life that had been polluted with the blackeſt treaſons, and unparalleled barbarities. From the exceſſes of cruelty committed in it, Polybius informs us, that this war was generally diſtinguiſhed among the Greeks by the name of the "Inexpiable war." During the Libyan war, the mercenaries in Sardinia declared againſt the Carthaginians, excited by the example of Matho and Spondius in Africa. They ſeized upon the perſon of Boſtar, who commanded in the citadel of Olbia, and maſſacred both him and the Carthaginian garriſon. The ſenate, appriſed of this revolt, ſent Hanno, with a ſtrong reinforcement of troops, to bring the mutineers to reaſon; but Hanno, on his arrival, was abandoned by his men who joined the mercenaries, and not only crucified their leader, but put to the ſword all the Carthaginians, whom they could find in the iſland. They then beſieged all the cities one after another, and ſoon gained poſſeſſion of the whole country. Feuds, however, ariſing between them and the natives, the mercenaries were driven entirely out of the iſland, and took ſanctuary in Italy. Thus the Carthaginians loſt Sardinia, which was to them an iſland of great importance, an account of its extent, its fertility, and the great number of its inhabitants. The Sardinian war began in the year 234 B. C. and continued three years.

The Romans ever ſince their treaty with the Carthaginians, had behaved towards them with great juſtice and moderation; and yet, notwithſtanding their profeſſions of friendſhip, they countenanced and protected the fugitive mercenaries. They ſent the conſul Sempronius, on trivial pretences, with a fleet, to reinſtate the malcontents, and take poſſeſſion of Sardinia, which the Carthaginians were obliged to cede. They alſo obliged the Carthaginians to defray the expence of their armament, and, beſides, extorted from them the ſum of 1200 talents. Such perfidious conduct could not fail of heightening the averſion Hamilcar had already conceived, and did not a little contribute to the ſecond Punic war, and to thoſe dreadful devaſtations which Hannibal afterwards committed in Italy.

Hamilcar, by the happy concluſion of the Libyan war, not only reſtored tranquillity to the republic, but greatly extended the conqueſts of the Carthaginians in Africa. But as his country was not in a condition to commence an immediate war with Rome, he determined, by a new plan of operations, to place it upon a level with the imperious republic; and with this view to make an entire conqueſt of Spain, that the Carthaginians might have troops capable of oppoſing the Romans. For this purpoſe Hamilcar inſpired both his ſon-in-law Aſdrubal and his ſon Hannibal with an implacable averſion to the Romans, as the inveterate enemies both of his grandeur and that of his country. Immediately after the troubles in Africa were appeaſed, the ſenate ſent Hamilcar on an expedition againſt the Numidians, in which he conducted himſelf with ſuch a degree of ſkill and valour, and alſo with ſuch ſucceſs, that he was veſted with the command of the army deſtined againſt Spain. His ſon Hannibal, although at this time only nine years of age, importuned his father for permiſſion to accompany him on this occaſion; and Hamilcar having granted his requeſt, previouſly ordered him to put his hand on the altar, and to ſwear, that he would be an irreconcileable enemy to the Romans, and act as ſuch when his age allowed. He likewiſe took with him Aſdrubal, after he had beſtowed his daughter in marriage upon that general.

As ſoon as the military preparations were completed, Hamilcar advanced with a powerful army to Abyla, and croſſing the ſtraits of Hercules, landed in Spain without oppoſition. He commanded in this country during nine years, in that interval ſubdued many warlike nations, and acquired an immenſe treaſure, which he wiſely diſtributed, partly among his troops, and partly among the great men at Carthage; thus ſecuring his intereſt with both theſe powerful bodies. At length, in a battle with the Vettones, or Vectones, a nation of Luſitania, he fell on the field, and died gloriouſly, as Polybius ſays, at the head of his troops, in the year B. C. 228. Upon Hamilcar's death, the army elected his ſon-in-law Aſdrubal, then the Carthaginian admiral, to ſucceed him in the command. The choice was confirmed by the ſenate; and it was amply juſtified by his ſubſequent conduct, though Hanno and his adherents affected to depreciate his merit. He built, or at leaſt fortified, New Carthage. See CARTHAGENA. The Romans, alarmed by the great progreſs which Aſdrubal was making in Spain, prevailed upon him, partly by menaces, and partly by perſuaſion, to conclude a new treaty with them, importing, that the Carthaginians ſhould not paſs the Iberus, and that Saguntum, a colony of Zacynthians, and a city between the Iberus, and that part of Spain, ſubject to the Carthaginians, as well as the other Greek colonies, ſhould enjoy their ancient rights and privileges. Aſdrubal did not paſs beyond the limits ſtipulated by the treaty, though he ſtill puſhed on his conqueſts, and ſubdued all that part of Spain extending from the weſtern ocean to the Iberus, within five days' journey of the Pyrenées. His engaging addreſs and affable deportment made him popular among the Reguli of Spain, and brought them over to the intereſt of Carthage. Having governed the Carthaginian dominions in Spain eight years, he was treacherouſly murdered by a Gaul, whoſe maſter he had put to death, B. C. 220. Three years before his death, Aſdrubal had written to Carthage, requeſting that Hannibal, who was then in the 24th year of his age, might be ſent to him; and on his firſt arrival in the camp, he manifeſted indications of extraordinary courage and greatneſs of mind, and intereſted the attachment of the whole army. Under Aſdrubal he made three campaigns, and was always employed in enterpriſes of the greateſt importance; and after his death, the army immediately ſaluted him general. At this time (viz. 220, B. C.) he was in the twenty-ſeventh year of his age, admitting (See Blair's tables) that he was born in the year 247 B. C. The ſenate, as well as the people of Carthage, confirmed this election, although Hanno and his faction were ſecretly averſe from his promotion. As ſoon as he aſſumed the command, he commenced a plan of operations, which all the officers approved. He began his career with marching againſt the Olcades, who were ſeated near the Iberus, and having reduced Althæa, their capital, their other towns immediately ſubmitted. With the opening of the next campaign he ſubdued the Vaccæi, and prepared to meet an army of 100,000 men, collected by the Carpetani, one of the moſt powerful nations in Spain, who had been induced to declare war againſt the Carthaginians. Having routed this formidable army, he deſolated the whole country of the Carpetani, who thought proper to ſubmit to the conqueror. His next object was the ſiege of Saguntum, and as the inhabitants had applied to the Romans for aſſiſtance, he made a vigorous effort for reducing the place before they could take any ſtep towards its relief. The progreſs of this ſiege was retarded by the valiant reſiſtance of the Saguntines, who, by their repeated ſallies, deſtroyed many of the beſiegers; though they were hardly ſenſible of their loſs, as Hannibal's army conſiſted of 150,000 foot, and 20,000 horſe. The fate of the city, however, was for ſome time reſpited, by a wound which Hannibal received as he was reconnoitring ſome of the works. As ſoon as he recovered, hoſtilities recommenced, after a ſhort ceſſation, with double fury; but the Saguntines, irritated by deſpair, at length forced the Carthaginians not only to abandon the breach they had made in the wall of the city, but to take refuge in their camp. After this repulſe, Hannibal remained for ſome days in a ſtate of inaction; but having inſpired his troops with courage and promiſed them great rewards from the plunder of the place, they made a vigorous attack, whilſt he placed himſelf on the top of a tower, which overlooked the works of the beſieged and the whole city. At laſt the Saguntines, having defended themſelves with an almoſt invincible valour and obſtinacy, found themſelves reduced by want of proviſions to the greateſt extremities, and to increaſe their diſtreſs, the Romans ſeemed to have entirely deſerted them. In this ſtate of deſpair, the ſenators brought all their gold, ſilver, and precious effects into the market place, and cauſing a great fire to be kindled threw their treaſure and themſelves into the flame. At this time a tower, which had been battered by Hannibal's rams, falling with a dreadful craſh, the Carthaginians entered the town by the breach, ſoon made themſelves maſters of it and the citadel, and cut to pieces all the inhabitants who were able to bear arms. The reduction of Saguntum, after a ſiege of eight months, took place in the year B. C. 219.

The capture of Saguntum has by ſome been repreſented as the cauſe of the *ſecond Punic war*, which commenced in the year B. C. 218. But Polybius affirms this to have been a very miſtaken notion. The regret of the Carthaginians, for their having ſo tamely given up Sicily, by the treaty which terminated the firſt Punic war; the injuſtice and violence of the Romans, who took advantage from the troubles excited in Africa, to diſpoſſeſs the Carthaginians in Sardinia, and to impoſe a new tribute on them; and the ſucceſs and conqueſts of the latter in Spain, were the true cauſes of the violation of the treaty, as Livy (agreeing with Polybius) inſinuates, in few words, in the beginning of his hiſtory of the ſecond Punic war.

When the news of the reduction of Saguntum arrived at Rome, it occaſioned inexpreſſible grief and conſternation. As ſoon as the Romans were able to reſtrain or ſuppreſs the firſt emotions occaſioned by this humiliating and diſtreſſing intelligence, an aſſembly of the people was convened, and war againſt the Carthaginians was unanimouſly decreed. That no ceremony might be wanting, deputies were ſent to Carthage, to inquire whether Saguntum had been beſieged by order of the republic, and if ſo, to declare war; or in caſe this ſiege had been undertaken ſolely by the authority of Hannibal, to require that he ſhould be delivered up to the Romans. The deputies perceiving that the ſenate gave no direct anſwer to their demands, one of them taking up the folded lappet of his robe, "I bring here," ſays he in a haughty tone, "either peace or war; the choice is left to yourſelves." The ſenate anſwering that they left the choice to him: "I give you war then," ſays he, unfolding his robe. "And we," replied the Carthaginians, with the ſame haughtineſs, "as heartily accept it, and are reſolved to proſecute it with the ſame cheerfulneſs."

When war was reſolved upon and proclaimed on both ſides, Hannibal, who, after the reduction of Saguntum, had put his troops into winter-quarters at New Carthage, and who remained during the winter in a ſtate of inaction, made ſeveral wiſe regulations for the ſecurity of the Carthaginian dominions in Spain and Africa. With this view he marched the forces out of the one into the other, ſo that the Africans ſerved in Spain and the Spaniards in Africa. The command of the Spaniſh forces was entruſted by Hannibal with his brother Aſdrubal, with a fleet of about 60 ſhips to guard the coaſts; and he alſo gave him the wiſeſt counſel for the direction of his conduct. Before Hannibal himſelf ſet out for his expedition, he went to Gades or Cadiz to diſcharge the vows which he had made to Hercules, and to engage himſelf by new vows, in order to obtain ſucceſs in the war upon which he was entering.

Having made every neceſſary preparation for his march, he left his winter-quarters at New Carthage early in the ſpring, with an army conſiſting of above 100,000 men, of whom 12,000 were horſe, and about 40 elephants. Here he is ſaid to have been encouraged by dreams and omens to proſecute his enterpriſe. He paſſed the Iberus without obſtruction, and ſoon ſubdued the ſeveral nations which oppoſed him in his march, though he loſt a conſiderable part of his army in this expedition. Before he proceeded further, he committed the command of the country between the Iberus and the Pyrenæan hills to Hanno, and 11,000 men. He diſmiſſed the like number, ſending them back to their reſpective countries, and aſſuring thoſe who remained that they ſhould be allowed to return whenever they deſired it. He then croſſed the Pyrenæan hills, and advanced at the head of 50,000 foot and 9,000 horſe as far as the banks of the Rhone. The paſſage of the Rhone was diſputed by the Gauls, who had aſſembled with all their forces for this purpoſe. Having ſucceeded in this arduous and difficult enterpriſe, he continued his march, croſſing through the middle of Gaul, and moving northwards, in order to avoid Scipio, and to favour his deſign of marching all his forces, without diminution by any engagement which he could eſcape, into Italy. During his progreſs through the country of the Allobroges, he was choſen umpire between two brothers, who diſputed their right to the kingdom. Brancus, the elder brother, having been reinſtated by Hannibal in his dominions, furniſhed his whole army with proviſions, clothes, and arms; and eſcorted him through the countries of the Tricaſtini, Vocontii, and Tricorii, as far as the river Druentia, now the Durance; and from thence he reached the foot of the Alps without oppoſition. In the proſecution of his march to the ſummit of the Alps he encountered many difficulties. The ſight of theſe mountains, which ſeemed to touch the ſkies, covered with ſnow, and exhibiting ſcarce any thing to the eye but a few tottering cottages ſcattered on the ſharp tops of inacceſſible rocks, not a little intimidated his troops. The meagre flocks almoſt periſhed with cold, and hairy ſavages, with fierce aſpects, renewed alſo the terror which the diſtant proſpect of this ridge of mountains had raiſed, and ſtruck a prodigious damp on the hearts of the ſoldiery. Beſides, the whole army was brought upon the verge of deſtruction by the perfidy of a Gallic nation; whoſe deputies, under the ſpecious appearance of friends, perſuaded Hannibal to commit himſelf to their conduct. But theſe faithleſs guides led him into a ſteep paſs, out of which they thought it would be impoſſible for him to make his eſcape. However, Hannibal, by the wiſe diſpoſition of his forces, as well as the aſſiſtance of his elephants, and bravery of his infantry, who greatly diſtinguiſhed themſelves on this occaſion, at laſt diſperſed the enemy. After which adventure he ſurmounted all other difficulties, and the ninth day from his beginning the aſcent, arrived at the top of the mountains. It muſt be obſerved, that Hannibal was in a great meaſure obliged to the elephants for his eſcaping all the diſaſters the enemy threatened him with; for wherever theſe huge animals appeared, the Gauls were ſtruck with ſuch terror, that they immediately fled with precipitation, leaving the road clear for the Carthaginian general.

Hannibal halted two days on the ſummit of the Alps, to refreſh his wearied troops, which were greatly diſpirited by the ſnow that had lately fallen. In order to animate them to make another effort with alacrity, from one of the higheſt hills he gave them a proſpect of the fruitful plains watered by the Po, the day before he decamped. He likewiſe pointed towards the place where Rome ſtood; which, he aſſured them, a battle or two would make them maſters of, and conſequently put a glorious period to all their toils. This proſpect inſpired them with ſuch vigour, that they ſeemed to have forgot all the fatigues they had undergone, and to think only of taking poſſeſſion of that haughty city, whoſe conduct towards their ſtate had been nothing but one continued ſeries of inſults ſince the concluſion of the Sicilian war.

They therefore purſued their march; but the difficulty and danger increaſed, in proportion as they approached nearer the end of the deſcent. We are told, that about this time Hannibal meditated a retreat; but from the genius of that general, as well as the whole tenour of his conduct, this conjecture ſeems highly improbable. To omit many particulars, they came at laſt to a path naturally very ſteep and craggy; which being rendered impracticable by the late falling of the earth, terminated in a frightful precipice above a thouſand feet deep. In ſhort, Hannibal found it would be impoſſible to accompliſh his deſign, without cutting a way in the rock itſelf, through which his men, horſes, and elephants might paſs; and this, with immenſe labour, he effected. Approaching, therefore, gradually the Inſubrian foot of the Alps, he detached ſome parties of his horſe to forage, there appearing now ſome ſpots of paſture where the ground was not covered with ſnow. Livy informs us, that in order to open and enlarge the path, large trees were felled, and piled round the rock, after which fire was ſet to them. The wind, by good fortune, blowing hard, a fierce flame ſoon broke out; ſo that the rock glowed like the very coals with which it was ſurrounded. Then Hannibal, according to the ſame author, cauſed a great quantity of vinegar to be poured on the rock; which piercing into the veins, that were now cracked with the intenſe heat of the fire, calcined and ſoftened it. In this manner, taking a large compaſs, in order that the deſcent might be eaſier, he cut a way along the rock, which opened a free paſſage to the forces, baggage, and elephants. As Polybius has paſſed over in ſilence the uſe Hannibal made of vinegar on this occaſion, many reject that incident as fabulous.

At length Hannibal gained the fruitful plains of Inſubria, where, in reviewing his army he found, that in five months and a half's march (for ſo long was it ſince he had left New Carthage), he had loſt by ſickneſs, deſertion, fatigue, and various engagements, thirty thouſand foot, and three thouſand horſe. His army now amounted to no more than twenty-ſix thouſand effective men. Above twenty thouſand had periſhed ſince his departure from the Rhodanus. That we may have a more diſtinct idea of Hannibal's march, it will be proper to give the names and diſtances of ſome of the principal places through which that general paſſed in his way to Italy, tranſcribed from Polybius. From New Carthage to the Iberus were computed two thouſand ſix hundred ſtadia; from the Iberus to Emporium, a ſmall maritime town, which ſeparated Spain from the Gauls, according to Strabo, ſixteen hundred ſtadia; from Emporium to the banks of the Rhodanus, ſixteen hundred ſtadia; from the Rhodanus to the Alps, fourteen hundred ſtadia; from the Alps to the plains of Inſubria, twelve hundred ſtadia. In all eight thouſand four hundred ſtadia, making much about a thouſand Engliſh miles.

Upon Hannibal's arrival in Italy he refreſhed his troops, and then marched againſt the Taurini, who had refuſed to enter into an alliance with him; and having encamped before Taurinum (Turin) their chief city, he carried it in three days, and put all who had oppoſed him to the ſword. This expedition ſo terrified the neighbouring Gauls, that they ſurrendered at diſcretion. The reſt of the Gauls would probably have followed their example, if they had not been awed by the terror of the Roman arms, which were now approaching. Hannibal therefore, as he had no time to loſe, thought it the wiſeſt courſe which he could purſue to march directly into their country, and to make ſuch an attempt as would induce thoſe who had an inclination to join him to put themſelves under his protection. Rome was greatly alarmed by the rapid progreſs of Hannibal, and Sempronius was ordered to leave Sicily, and haſten to the relief of his country; whilſt Scipio, the other conſul, advanced with the utmoſt diligence towards the enemy, croſſed the Po, and pitched his camp near the Ticinus, now the Teſino in Lombardy. Here the Roman and Carthaginian armies came in ſight of each other; and the generals on each ſide prepared for battle by haranguing their reſpective ſoldiers. The conteſt continued for a long time with equal ſucceſs, and many fell on both ſides. At length the Roman troops were put into diſorder by the Numidians, who attacked them in the rear, and eſpecially by a wound which the conſul received, and by which he was diſabled. However, he retreated in good order, and was conveyed to his camp by a body of horſe, who covered him with their arms and bodies. He haſtened to the Po, which he croſſed with his army, and then broke down the bridge, ſo that he prevented Hannibal from overtaking him. For this firſt victory Hannibal was indebted to his cavalry; and it was hence inferred that the ſtrength of his army conſiſted in his horſe, and that on this account it would be proper for the Romans to avoid large open plains, like thoſe between the Po and the Alps. The battle of Ticinus was followed by that of Trebia, a ſmall river of Lombardy which falls into the Po a little above Placentia, where Sempronius, who had arrived from Sicily, joined his forces to thoſe of Scipio. Having gained an inconſiderable advantage over a party of Carthaginians, and finding himſelf at the head of 16,000 Romans and 20,000 allies, excluſive of cavalry, he determined, againſt the more prudent counſel of his colleague, to make immediate preparation for battle. On this occaſion the Carthaginians gained a complete victory, with a very inconſiderable loſs. Hannibal availed himſelf of the opportunity which winter-quarters afforded him for refreſhing his troops, and gaining the affections of the natives. For this purpoſe, after having declared to the priſoners he had taken from the Roman allies, that he was not come with the view of making war upon them, but to reſtore the Italians to their liberty, and protect them againſt the Romans, he ſent them all home to their reſpective countries, without requiring any ranſom. As ſoon as the winter was paſt, he ſet out towards Tuſcany; but in his march over the Apennines he was overtaken with a dreadful ſtorm, which deſtroyed great numbers of his men. He therefore marched back to Placentia, where he again engaged with Sempronius; the loſs in the conteſt on both ſides being nearly equal. Hannibal, having received information that C. Flaminius, one of the new conſuls, had advanced as far as Arretium, a town of Tuſcany, reſolved to march thither and engage him as ſoon as poſſible. Accordingly, after having encountered incredible hardſhips in his way, he pitched his camp between Arretium and Feſulæ, in the richeſt and moſt fruitful part of Tuſcany. Concluding from the character of Flaminius, who was arrogant, bold, and enterpriſing, that he ſhould ſoon be able to bring him to a battle, Hannibal loſt no opportunity of inflaming his impetuous ſpirit, and of accelerating the action in which he wiſhed to engage. He therefore laid waſte with fire and the ſword the country through which he paſſed, and advanced in his progreſs towards Rome. Having gained an eminence, at the termination of a narrow defile formed by the mountains of Cortona and the lake Thraſymene, and being purſued by the Roman conſul, he prepared for battle; and the event was the total defeat of the conſular army. Flaminius himſelf with 15,000 men were left dead on the field, and about 10,000 eſcaped to Rome by different roads. Hannibal loſt only 1500 men, moſt of whom were Gauls; though great numbers both of his ſoldiers and of the Romans died afterwards of their wounds. Having made diligent but ineffectual ſearch for the body of Flaminius, for the purpoſe of giving it an honourable burial, he put his troops into quarters of refreſhment, and ſolemnized the funerals of 30 of his chief officers, who had been ſlain in the action. This battle was fought in the year B.C. 217. Hannibal, not thinking it proper to advance directly to Rome, purſued his route through Umbria and Picenum; and after ten days' march arrived in the territory of Adria. As he plundered the country through which he paſſed, he was loaded with booty. Having attacked Spoletum, and being repulſed with loſs, he proceeded to the frontiers of Apulia, and ravaged the adjacent territories. Polybius informs us, that Hannibal treated the allies of the Romans with the utmoſt cruelty in this expedition. At this time Fabius, followed by Minucius and four legions, had marched from Rome in queſt of the enemy; but with a firm reſolution not to let him take the leaſt advantage, nor to advance one ſtep till he had firſt reconnoitered every place; nor hazard a battle, till he ſhould be ſure of ſucceſs. Hannibal made various attempts to provoke Fabius to a battle, but they were all ineffectual. The dictator, notwithſtanding all the artifices, the marches, counter-marches, and feints, of the Carthaginian general, inflexibly adhered to his firſt reſolution, and gave his crafty enemy to underſtand, that the Romans, inſtructed by their defeats, had at laſt made choice of a general capable of oppoſing Hannibal. Reſolved on leaving Campania with his immenſe ſpoils, Hannibal marched with his army towards the confines of Samnium; but was much incommoded in his progreſs by the prudent diſpoſitions and movements of Fabius. Having encamped at the foot of the mountains, he found himſelf involved in great difficulties, as the Romans had ſeized upon Caſilinum and Callicula, and pent up his army in ſuch a manner, that it ſeemed impoſſible for him to eſcape. Whilſt Fabius was preparing for an attack, the inventive genius of Hannibal contrived a ſtratagem, by which he eluded the efforts of the Roman dictator, and preſerved both himſelf and his army, when they were upon the very brink of deſtruction. He afterwards returned to Apulia, and having taken the town of Gerunium by aſſault, made this the place of his encampment. In the mean time, Fabius, being ordered to Rome, left the command of the army to Minucius, his general of horſe, with orders to obſerve the motions of Hannibal at a proper diſtance; but by no means to engage him. The ſequel is related under the article CANNÆ, where the Carthaginian general obtained a complete victory over the Romans. See alſo CAPUA.

Whilſt Hannibal was purſuing his conqueſts in Italy, the Carthaginian affairs in Spain, in conſequence of the defeat of Aſdrubal by Scipio, began to wear an unpromiſing aſpect. Scipio, improving his naval victory, took Honoſca by ſtorm, and levelled it with the ground. From thence he proceeded to New Carthage; laid waſte the adjacent territory, and ſet fire to the ſuburbs of that city. He alſo obtained ſeveral other advantages in the iſland Ebuſus, now Yvica, and in other places; and concluded a treaty with the inhabitants of the Balearic iſlands. After theſe exploits Livy ſays, that 20 different cantons of Spaniards ſubmitted to the Romans; and Aſdrubal was compelled to retire into Luſitania, and thoſe parts of Spain, that border upon the ocean. The Carthaginian commander was alſo reduced to great difficulties by the irruption of the Celtiberian princes, under the order of Scipio, into the Carthaginian territories; by their capture of three fortreſſes; and by two defeats, in which 15,000 men belonging to Aſdrubal's army were killed, and 4000 taken priſoners. The two Scipios in this campaign paſſed the Iberus, and penetrated into the Carthaginian dominions, as far as Saguntum. Whilſt their arms were making conſiderable progreſs in Spain, Aſdrubal received orders from Carthage to march into Italy for the relief of his brother; but the two Roman generals reſolved to prevent, if poſſible, his leaving Spain. They therefore forced him to fight, and defeated him, ſo that he could neither continue his march for Italy, nor remain with any ſafety in Spain. In Sardinia the Carthaginians were no leſs unſucceſsful; for, in a battle fought againſt the Romans, they loſt 12,000 men, and a greater number of priſoners, among whom were Aſdrubal, ſurnamed Calvus, Hanno, and Mago, who were diſtinguiſhed by their birth as well as military exploits. Afterwards the face of affairs was very much changed in Spain. The two Scipios were defeated and killed, and the Roman territories in that country ſeemed to be inevitably loſt. They were preſerved, however, by the valour of L. Marcus, a private officer of the Equeſtrian order; and ſhortly after, the younger Scipio was ſent thither, who revenged the death of his father and uncle, and reſtored the affairs of the Romans in Spain to their former flouriſhing condition.

From the period of Hannibal's abode at Capua, the Carthaginian affairs in Italy no longer ſupported their reputation. M. Marcellus, firſt as prætor and afterwards as conſul, contributed very much to this revolution. He haraſſed Hannibal's army on every occaſion, ſeized upon his quarters, forced him to raiſe ſieges, and even defeated him in ſeveral engagements; ſo that he was called the ſword of Rome, as Fabius had before been named its buckler. But what moſt affected the Carthaginian general, was to ſee Capua beſieged by the Romans. In order to preſerve his reputation among his allies, he flew to its relief, attacked the Romans, and fought ſeveral battles in order to oblige them to raiſe the ſiege. But all his meaſures for this purpoſe being defeated, he marched haſtily towards Rome, that he might thus make a powerful diverſion. Rome was at firſt much alarmed; and one of the ſenators propoſed to recal all the armies to ſuccour the capital. Fabius, however, declared, that it would be ſhameful in them to be terrified, and forced to change their meaſures upon every motion of Hannibal. They, therefore, contented themſelves with recalling only part of their army; and whilſt Hannibal and the Roman conſul, having drawn up their reſpective armies before the city, were preparing for a deciſive battle, of which Rome was to be the recompence, a violent ſtorm obliged them to ſeparate. When they again repeatedly rallied, the ſame impediment to action occurred; ſo that Hannibal, believing ſomething ſupernatural in the event, ſaid, according to Livy, that ſometimes his own will, and ſometimes fortune, would not ſuffer him to take Rome. At length he retired, and in his march plundered the rich temple of the goddeſs Feronia. The ſucceſs of the Romans in the ſiege of Capua gave them a viſible ſuperiority over the Carthaginians; and diſplayed, at the ſame time, how formidable the power of the Romans was, when they undertook to puniſh their perfidious allies; and the feeble protection which Hannibal could afford his friends, at a time when they moſt wanted it. It remains that we mention one unforeſeen defeat that ruined all the meaſures, and blaſted all the hopes of Hannibal with regard to Italy. The conſuls of the 11th year of the ſecond Punic war (B. C. 207.) were C. Claudius Nero, and M. Livius. The province of the latter was the Ciſalpine Gaul, where he was to oppoſe Aſdrubal, who, according to report, was preparing to paſs the Alps. The former commanded in the country of the Brutians, and in Lucania, that is, in the oppoſite extremity of Italy, and was there making head againſt Hannibal. The paſſage of the Alps gave Aſdrubal very little trouble: the way having been previouſly cleared by his brother, and all nations being diſpoſed to receive him. Some time after this he diſpatched couriers to Hannibal, who were intercepted; and by their letters Nero found, that Aſdrubal was haſtening to join his brother in Umbria. In order to diſconcert and defeat this plan, Nero ſet out with a detachment of his army conſiſting of 7000 men, and marching with extraordinary diligence, joined the other conſul in the night. When Aſdrubal diſcovered, by reconnoitering the enemy's army, that freſh troops were arrived, he concluded that they belonged to the other conſul, and was thus led to conjecture, that his brother had ſuſtained a conſiderable loſs, and alſo to fear, that he was come too late for his aſſiſtance. He therefore ſounded a retreat, and his army began to march in great diſorder. Whilſt he was preparing to croſs the river Metaurus, the army of the enemy came up with him, and in this extremity it was impoſſible to avoid an engagement. The battle that enſued was long and obſtinate; and Aſdrubal diſtinguiſhed himſelf by his ſelf-poſſeſſion and valour. At length, when victory declared for the Romans, being unable to ſurvive the loſs of ſo many thouſand men, who had quitted their country to follow his fortune, he ruſhed at once into the middle of a Roman cohort, and there died in a manner worthy of the ſon of Hamilcar, and brother of Hannibal. This was the moſt bloody battle which the Carthaginians had fought during this war; and whether we conſider the death of the general, or the ſlaughter made of the Carthaginian forces, it may be looked upon as a repriſal for the battle of Cannæ. The Carthaginians loſt 55,000 men, and 6000 were taken priſoners. The Romans loſt 8000. Theſe were ſo weary of killing, that ſome perſon telling Livius, that he might very eaſily cut to pieces a body of the enemy who were flying; "It is fit," ſays he, "that ſome ſhould ſurvive, in order that they may carry the news of this defeat to the Carthaginians." Aſdrubal's head being thown into the camp of the Carthaginians, informed Hannibal of his brother's fate. Hannibal perceived by this cruel ſtroke the fortune of Carthage; "It is done," ſays he, "I will no longer ſend triumphant meſſages to Carthage. In loſing Aſdrubal, I have loſt at once all my hope, all my good fortune." He afterwards retired to the extremity of the country of the Brutians, where he aſſembled all his forces, who found it a very difficult matter to ſubſiſt there, as no proviſions were ſent them from Carthage. The fate of arms was not more propitious to the Carthaginians of Spain. The three Carthaginian generals in that country, Aſdrubal, ſon of Giſco, Hanno, and Mago, having been defeated with their numerous armies, by the Romans, in ſeveral engagements, Scipio the younger at laſt poſſeſſed himſelf of Spain, and ſubjected it entirely to the Roman power. Upon his return to Rome, he was declared conſul, at the age of 30 years, and Sicily was allotted to him. He ſet out with all imaginable expedition for this province; whilſt his colleague in the conſulate, P. Licinius Craſſus, was to command in the country to which Hannibal had retired. Soon after Scipio croſſed over to Africa, and made this country the ſeat of war. The devaſtation of the country; the ſiege of Utica; the entire defeat of the two armies under Syphax and Aſdrubal, whoſe camp was burnt by Scipio; and afterwards the capture of Syphax himſelf, in whom the Carthaginians repoſed their chief confidence;—all theſe things forced them at laſt to turn their thoughts to peace. Accordingly, they deputed 30 of their principal ſenators, ſelected out of the powerful body at Carthage, called the "Council of the Hundred," to wait on the Roman general in his tent; who accuſed Hannibal as the author of all their calamities, and promiſed, in the name of the ſenate, an implicit obedience to whatever the Romans ſhould pleaſe to ordain. Scipio replied, that he would grant them a peace, upon condition that they ſhould deliver up all the priſoners and deſerters to the Romans; that they ſhould recal their armies out of Italy and Gaul; ſhould never again ſet foot in Spain; ſhould retire out of all the iſlands between Italy and Africa; ſhould deliver up all their ſhips, 20 excepted, to the victor; ſhould give to the Romans 500,000 buſhels of wheat, 300,000 of barley, and pay 15,000 talents:—and that, in caſe they were pleaſed with theſe conditions, they then might ſend ambaſſadors to the ſenate. The Carthaginians feigned compliance, in order to gain time till Hannibal returned. A truce was then granted to the Carthaginians, who immediately ſent deputies to Rome, and at the ſame time an expreſs to Hannibal to order his return into Africa. Hannibal received the orders from Carthage with inexpreſſible concern; and he returned home, turning his eyes wiſhfully to Italy, accuſing gods and men of his misfortunes, and calling down a thouſand curſes, as Livy ſays, upon himſelf for not having marched his ſoldiers directly to Rome after the battle of Cannæ, whilſt they were ſtill reeking with the blood of its citizens. The deciſion of the whole matter was referred by the Roman ſenate to Scipio, who, being upon the ſpot, could beſt judge what conditions were moſt ſuitable to the welfare of the ſtate. About this time a Roman fleet of about 200 veſſels of burthen was diſperſed near Carthage by a ſtorm; and Aſdrubal ſailed out of the harbour, by order of the ſenate, ſeized the greateſt part of them, and brought them to Carthage, though the truce was ſtill ſubſiſting. This act of aggreſſion was complained of by Scipio; but his remonſtrances were little regarded by the Carthaginians. Hannibal's approach had revived their courage, and inſpired them with very flattering hopes. This circumſtance afforded a new occaſion of war between the two nations. Hannibal, now deſirous of peace more than a renewal of the war, flattered himſelf that the conditions of it would be more honourable, as he was at the head of an army, and as the fate of arms might ſtill appear uncertain. He therefore ſolicited an interview with Scipio, which was agreed to at a time and place that were fixed. This interview proving ineffectual, the generals left one another with a reſolution to decide the fate of Carthage by a general battle, fought on the plains of Zama, about five days' march from Carthage, in the year B. C. 202. The Carthaginians, after a very obſtinate fight, were obliged to fly, leaving 20,000 men on the field of battle, and the like number of priſoners were taken by the Romans. Hannibal eſcaped in the tumult, and entering Carthage, owned that he was irrecoverably defeated, and that the citizens had no alternative left, but the acceptance of peace on any conditions. Thirty deputies waited upon the conqueror at Tunis, and ſued for peace on the moſt ſubmiſſive terms. Scipio called a council, the majority of which were for raſing Carthage and treating the inhabitants with the utmoſt ſeverity. But the conſideration of the time which it would require before a city ſo ſtrongly fortified could be taken, and Scipio's fear leſt a ſucceſſor might be appointed to him whilſt he ſhould be employed in the ſiege, made him incline to clemency. Accordingly a peace, terminating the ſecond Punic war, was concluded between the Carthaginians and Romans, upon the following conditions dictated by Scipio: "that the Carthaginians ſhould continue free and preſerve their laws, their territories, and the cities they poſſeſſed in Africa before the war:—that they ſhould deliver up to the Romans all deſerters, ſlaves, and captives belonging to them; all their ſhips, except 10 triremes; all their tame elephants, and that they ſhould not train up any more for war:—that they ſhould not make war out of Africa, nor even in that country, without firſt obtaining leave for that purpoſe from the Roman people:—that they ſhould reſtore to Maſiniſſa all they had diſpoſſeſſed either him or his anceſtors of:—that they ſhould furniſh money and corn to the Roman auxiliaries, till their ambaſſadors ſhould be returned from Rome:—that they ſhould pay to the Romans 10,000 Euboic talents of ſilver, (1,750,000l.) in 50 annual payments; and give 100 hoſtages, who ſhould be nominated by Scipio:—and in order that they might have time to ſend to Rome, it was agreed to grant them a truce, upon condition that they ſhould reſtore the ſhips taken during the former war, without which they were not to expect either a truce or peace." Soon after the treaty of peace with the Romans, an article in this treaty involved the Carthaginians in a diſpute with Maſiniſſa. This article required them to reſtore to Maſiniſſa all the territories and cities which he poſſeſſed before the war; and, moreover, Scipio, in recompence of the zeal and fidelity which that monarch had ſhewn with regard to the Romans, had added his dominions to thoſe of Syphax. From this circumſtance originated the contention that afterwards took place between the Carthaginians and Numidians. Syphax and Maſiniſſa were both kings in Numidia; but occupied different parts of this country. The ſubjects of the former were called Maſæſuli, and their capital was Cirtha: thoſe of the latter were the Maſſyli; but the name of Numidians was common to both. Their principal ſtrength conſiſted in their cavalry; and they always rode without ſaddles, and ſome even without bridles, whence Virgil (Æn. l. iv. v. 41.) called them "Numidæ Infræni." A conteſt having occurred between theſe two princes, in the progreſs of which Syphax was defeated and captured, the dominions of this prince were beſtowed upon Maſiniſſa, and the Carthaginians were obliged to reſtore all which he poſſeſſed before. Maſiniſſa had likewiſe ſeized part of a fertile territory, ſituated towards the ſea-ſide, near the leſſer Syrtis, which had been accuſtomed to pay tribute to the Carthaginians. Appeals had been made to Rome; but the conteſt remained undecided, though it was evident that the Roman ſenate favoured Maſiniſſa. In a courſe of time the Carthaginians farther remonſtrated againſt the encroachments of the Numidian prince; and complained to the ſenate of Rome, that, beſides the lands at firſt conteſted, he had diſpoſſeſſed them of upwards of 70 towns and caſtles. They likewiſe ſtated that they were reſtricted from ſeeking redreſs by the above-mentioned article of the laſt treaty. To their earneſt application, and the counter-ſtatement of Maſiniſſa, the Roman ſenate replied, that the ancient limits ſhould be preſerved; and that it was far from being their intention to have the Carthaginians diſpoſſeſſed, during the peace, of thoſe territories and cities which had been reſerved to them by the treaty. But theſe aſſurances, apparently impartial and even favourable to the Carthaginians, were mere words. The Romans were ſecretly in the intereſt of Maſiniſſa, and protracted the buſineſs, in order to give him an opportunity of eſtabliſhing himſelf in his uſurpation, and of weakening his enemies. A new deputation was ſent from Rome in order to ſettle the diſpute; and Cato was one of the commiſſioners. Maſiniſſa profeſſed to acquieſce in their deciſion; and the Carthaginians avowed their adherence to the treaty which they had concluded with Scipio. The deputies, after having viſited the country and examined the ſtate of Carthage, expreſſed their aſtoniſhment, that, after the calamities which it had ſuffered, it ſhould have riſen again, and ſo ſoon, to ſuch a pitch of power and grandeur. When the members of the ſenate received this intelligence from the deputies, they declared, that Rome could never be in ſafety ſo long as Carthage ſhould ſubſiſt. From this time, whatever affair was debated in the ſenate, Cato always added the following words to his opinion: "I conclude that Carthage ought to be deſtroyed." At this time diviſions broke out in Carthage; 40 citizens were ſent into baniſhment; and the exiles withdrew to the court of Maſiniſſa, who ſent his ſons to Carthage, to ſolicit their return. But the gates of the city were ſhut againſt them, and one of them was cloſely purſued by Hamilcar, one of the generals of the republic: this gave occaſion to a new war; armies were levied on both ſides; and a battle was fought in the preſence of the younger Scipio, who afterwards ruined Carthage. The fight was long and obſtinate, but at laſt the Carthaginians gave way. When the battle had terminated, the Carthaginians intreated Scipio to put an end to their conteſts with Maſiniſſa; but having completed the object of his miſſion, he returned to Rome without ſettling the diſpute, and reconciling the contending parties. In the progreſs of the conteſt, the Carthaginians, reduced to the greateſt extremity by famine and the plague, ſurrendered to Maſiniſſa, promiſing to deliver up the deſerters, to pay him 5000 talents of ſilver in 50 years, and to reſtore the exiles, notwithſtanding the oaths by which they had bound themſelves to the contrary. They all ſubmitted to the ignominious ceremony of paſſing under the yoke, which was a kind of gallows, made by two forked ſticks ſtanding upright, with a ſpear laid acroſs, under which vanquiſhed enemies were obliged to paſs: and of 58,000 men, very few returned to Carthage.

The Carthaginians in this humbled and diſtreſſed ſtate renewed their application to Rome; but their deputies, commiſſioned once and again to the ſenate, returned without ſatisfaction. At Rome diſputes occurred between Cato and Scipio Naſica with reſpect to the meaſures that were proper to be purſued. Cato delivered a ſpeech, in which he deſcanted on the powerful and proſperous ſtate of Carthage, and ending his ſpeech threw down ſome African figs, the ſize and beauty of which were much admired by the ſenators: "Know," ſays he, "that it is but three days ſince theſe figs were gathered; ſuch is the diſtance between the enemy and us." Naſica, on the contrary, was of opinion, that the Carthaginians were too weak to ſubdue the Romans, and, at the ſame time, ſo powerful, that it was not for the intereſt of the Romans to conſider them in a contemptible light. The ſenate, however, reſolved to declare war againſt the Carthaginians; and the reaſons or pretences for it were, their keeping up ſhips, contrary to the tenor of treaties, and their ſending an army out of their territories, againſt a prince who was in alliance with Rome, and whoſe ſon they treated ill, at the time he was accompanied by a Roman ambaſſador. At the moment of their deliberation, deputies arrived from Utica, the ſecond city of Africa, poſſeſſing a ſpacious harbour, and within 60 furlongs of Carthage, ſo that it might ſerve as a place of arms in the attack of that city, ſurrendering themſelves, their effects, their lands, and their city, into the hands of the Romans. They, therefore, heſitated no longer; but immediately proclaimed war, committing the conduct of it to the two conſuls Manilius and L. Marcius Cenſorinus, and giving them ſecret orders not to end the war but by the deſtruction of Carthage. To them was committed a conſiderable fleet, on board of which were 80,000 foot, and about 4000 horſe. Thus commenced, in the year B. C. 149, the *third Punic war*, about 53 years after the termination of the ſecond, which, though much leſs conſiderable than either of the former, with regard to the number and importance of the battles that were fought, and its continuance, which was leſs than 4 years, was nevertheleſs much more remarkable, with reſpect to the ſucceſs and event of it, as it ended in the total deſtruction and ruin of Carthage.

As ſoon as the ſenate had formed its reſolution, a courier was ſent to Carthage with its decree, and with information that the Roman fleet had ſailed. After many former and recent loſſes, which the Carthaginians had ſuſtained, they were by no means in a condition to reſiſt ſuch an enemy, ſince they had not been able ſucceſsfully to oppoſe Maſiniſſa. Troops, proviſions, ſhips, allies, in a word, every thing was wanting; and hope and vigour more than all the reſt. As ſoon as it was known that the fleet was arrived at Utica, the deputies of Carthage repaired to the Roman camp, ſignifying that they were come in the name of the republic, in order to receive their commands, which they were ready to obey. The conſul required the immediate ſurrender of all their arms. The order was inſtantly complied with; and there arrived in the camp a long train of waggons, loaded with all the preparatory implements of war, taken out of Carthage; 200,000 complete ſets of armour, a numberleſs multitude of darts and javelins, with 2000 engines for ſhooting darts and ſtones. The deputies, accompanied by the moſt venerable ſenators and prieſts, followed, and received from Cenſorinus the conſul, the heart-rending decree of the ſenate, "that it was their abſolute will and pleaſure that you depart out of Carthage, which they have reſolved to deſtroy, and that you remove into any other part of your dominions, as you ſhall think proper, provided it be at the diſtance of 80 ſtadia from the ſea." This decree was received with the moſt bitter anguiſh, and when it was communicated to the people, nothing was ſeen and heard in every part of the city but howling and deſpair, madneſs and fury. After this tranſaction, the conſuls made no great haſte to march againſt Carthage, as they knew the city was diſarmed. However, the inhabitants, being unanimouſly reſolved not to quit the city, took the advantage of this delay to put themſelves in a poſture of defence. They appointed as general, without the walls, Aſdrubal, who was at the head of 20,000 men, and within the walls the command was given to another Aſdrubal, the grandſon of Maſiniſſa. They then applied with great diligence and expedition to the manufacture of arms. The temples, the palaces, the open markets and ſquares, were all changed into arſenals, where men and women worked day and night. Every day were made 140 ſhields, 300 ſwords, 500 pikes or javelins, 1000 arrows, and a great number of engines to diſcharge them; and becauſe they wanted materials to make ropes, the women cut off their hair for this purpoſe. During this interval the conſuls were advancing towards the city in order to beſiege it. The Carthaginians defended themſelves with incredible reſolution and vigour; and renewed the boldeſt ſallies, for repulſing the beſiegers, burning their engines, and haraſſing their foragers. Cenſorinus attacked the city on one ſide, and Manilius on the other. Scipio, afterwards ſurnamed Africanus, was then a tribune in the army; and diſtinguiſhed himſelf above the reſt of the officers, by his prudence as well as his bravery. The beſieged, though thus powerfully aſſailed, were recovering their ſpirits, in conſequence of ſome advantages which they gained. Their troops increaſed, and they obtained an acceſſion of allies. This news occaſioned ſome uneaſineſs at Rome; but the fame of Scipio had alſo arrived in the city; and when he appeared in the aſſembly, as a candidate for the ædileſhip, a general perſuaſion prevailed, that he was deſigned by the gods to end the third Punic war, as the firſt Scipio, his grandfather by adoption, had terminated the ſecond. Inſtead, therefore, of granting him the ædileſhip, for which he was a candidate, they for once diſregarded the laws, and conferred upon him the conſulſhip, aſſigning him Africa for his province. As ſoon as Scipio had completed his recruits, he ſet out for Sicily, and ſoon after arrived at Utica. Immediately upon his arrival, he revived the diſcipline among the troops, and made ſeveral neceſſary regulations. Having ordered his troops to provide themſelves with axes, levers, and ſcaling ladders, he led them in the dead of the night, and without the leaſt noiſe, to a diſtrict of the city called Megara; when ordering them to give a general and ſudden ſhout, he attacked it with great vigour. The enemy, though ſomewhat terrified by this unexpected attack, defended themſelves ſo courageouſly, that Scipio could not ſcale the walls. But perceiving a tower that was forſaken, and which ſtood without the city, very near the walls, he detached thither a party of intrepid ſoldiers, who, by the help of pontons, got from the tower to the walls, and from thence into Megara, the gates of which they broke down. Scipio entered it immediately after, and drove the enemies out of that poſt; who, terrified at this unapprehended aſſault, and imagining that the whole city was taken, fled into the citadel; whither they were followed even by thoſe forces that were encamped without the city, who abandoned their camp to the Romans, and thought it neceſſary to fly into a place of ſecurity. At day-break, Aſdrubal perceiving the ignominious defeat of his troops, in order to be revenged on the Romans, and, at the ſame time, to deprive the inhabitants of all hopes of accommodation and pardon, brought all the Roman priſoners he had taken upon the walls, in the ſight of the whole army. There he put them to the moſt exquiſite tortures; putting out their eyes, cutting off their noſes, ears, and fingers; tearing their ſkin to pieces with iron rakes or harrows; and then threw them headlong from the top of the battlements. This inhuman treatment filled the Carthaginians with horror; however, he did not ſpare even them, but murdered many ſenators who had been ſo brave as to oppoſe his tyranny. Scipio, having made himſelf abſolute maſter of the iſthmus, burnt the camp which had been deſerted by the enemy, and built a new one for his troops; and by means of a high wall which he conſtructed, equal to the whole breadth of the iſthmus, that is, 25 ſtadia, with towers and redoubts at proper diſtances, he lodged his forces in ſafety, and cut off all proviſions from the beſieged, thus producing a famine which ſoon after raged in the city. To deprive them more completely of neceſſary ſupplies, he attempted to ſtop up the mouth of the haven by a mole. This effort, however, was ineffectual; as the Carthaginians opened, on a ſudden, a new outlet on the other ſide of the haven, and appeared at ſea with a numerous fleet, which they had then built with the old materials found in their magazines. Having thus offered a kind of inſult or bravado to the Romans, without immediately attacking their fleet, which it is ſaid they ought to have done, they returned into the harbour. In a ſubſequent naval engagement, they were defeated. Scipio having made ſome further advances towards the diſtreſs and capture of the city, terminated this campaign. During the winter-quarters, he endeavoured to overpower the enemy's troops without the city; and in his laſt action cut to pieces above 70,000 of the enemy, as well ſoldiers as peaſants, who had been enliſted, and carried a neighbouring fort, called Nepheris, after ſuſtaining a ſiege of 22 days. The ſeizure of this fort was followed by the ſurrender of almoſt all the ſtrong holds in Africa; and contributed very much to the taking of Carthage itſelf, into which, from that time, it was almoſt impoſſible to bring any proviſions. Early in the ſpring, Scipio attacked, at one and the ſame time, the harbour called Cothon, and the citadel. In the progreſs of this buſineſs a dreadful ſlaughter took place for 6 days; but on the 7th day, when it was expected the ſiege would have continued much longer, and much more blood have been ſhed, there appeared a company of men in a ſuppliant poſture and habit, who deſired no other conditions but that the Romans would pleaſe to ſpare the lives of all thoſe who ſhould be willing to leave the citadel. The requeſt was granted to all, except the deſerters; and, accordingly, 50,000 men and women came out. The deſerters, about 900 in number, finding that they had no quarter to expect, fortified themſelves in the temple of Æſculapius, with Aſdrubal, his wife, and two children; where they might have held out a long time, though their number was ſmall, as the temple ſtood on a very high eminence of rocks, to which the aſcent was by 60 ſteps. But at length their patience was exhauſted, and they abandoned the lower part of the temple, and retired to the uppermoſt ſtory, reſolving not to quit it but with their lives. Aſdrubal came down privately to Scipio, and, being deſirous of ſaving his life, threw himſelf at the feet of the Roman general; by whom he was exhibited to the deſerters, who, tranſported with rage at the ſight, poured out their imprecations againſt him, and ſet fire to the temple. Whilſt it was lighting, we are told, that Aſdrubal's wife, dreſſing herſelf as ſplendidly as poſſible, and placing herſelf with her two children in ſight of Scipio, addreſſed him with a loud voice: "I call not down," ſays ſhe, "curſes upon thy head, O Roman; for thou only takeſt the privilege allowed thee by the laws of war; but may the gods of Carthage, and thou, in concert with them, puniſh, according to his deſerts, the falſe wretch, who has betrayed his country, his gods, his wife, his children!" Then, directing herſelf to Aſdrubal, "Perfidious wretch," ſays ſhe, "thou baſeſt of creatures! this fire will preſently conſume both me and my children; but as to thee (too ſhameful general of Carthage!) go—adorn the gay triumph of thy conqueror—ſuffer, in the ſight of all Rome, the tortures thou ſo juſtly deſerveſt!" She had no ſooner pronounced theſe words, but ſeizing her children, ſhe cut their throats, threw them into the flames, and afterwards ruſhed into them herſelf, in which ſhe was imitated by all the deſerters.

As for Scipio himſelf, when he ſaw the ruin of this famous city, he ſhed tears over its fate; and reflecting that cities, nations, and empires, are liable to revolutions no leſs than individuals; that the like ſad fate had befallen Troy, anciently ſo powerful; and, in later times, the Aſſyrians, Medes, and Perſians, whoſe dominions were once ſo extenſive; and, laſtly, the Macedonians, whoſe empire had been ſo glorious throughout the world; theſe mournful ideas ſuggeſted to him the following verſes of Homer, which he repeated:

> "Ἔσσεται ἦμαρ, ὅταν ποτ' ὀλώλῃ Ἴλιος ἱρὴ,
> Καὶ Πρίαμος καὶ λαὸς ἐϋμμελίω Πριάμοιο."
> Il. δ. 164, 165.

> "The day ſhall come, that great avenging day,
> Which Troy's proud glories in the duſt ſhall lay,
> When Priam's pow'rs and Priam's ſelf ſhall fall,
> And one prodigious ruin ſwallow all." Pope.

By this citation he denounced the future deſtiny of Rome, as he himſelf confeſſed to Polybius, who deſired Scipio to explain himſelf on that occaſion.

After the capture of Carthage, Scipio gave the plunder of it (the treaſures of the temples excepted) to his ſoldiers for ſome days. He alſo ordered the inhabitants of Sicily to come and take poſſeſſion of the pictures and ſtatues which the Carthaginians had deſpoiled them of, in the former wars; and he reſtored to the citizens of Agrigentum, Phalaris's famous bull (ſee Bull), admoniſhing them, that this bull, which was a monument of the cruelty of their ancient kings, and of the lenity of their preſent ſovereigns, ought to make them ſenſible, which would be moſt advantageous for them, to live under the yoke of the Sicilians, or the government of the Romans. When he expoſed to ſale part of the ſpoils of Carthage, he expreſsly prohibited, under the ſevereſt penalties, his own family from taking or buying any of them; thus preventing any ſuſpicion of avarice from being attached to himſelf. When the news of this event arrived at Rome, the ſenators ſent 10 commiſſioners to Africa, whoſe firſt care was to demoliſh every remnant of Carthage; and they alſo iſſued orders, that it ſhould never again be inhabited, and denounced dreadful imprecations againſt thoſe, who, contrary to this prohibition, ſhould attempt to rebuild any parts of it, eſpecially thoſe called Byrſa and Megara. The commiſſioners further decreed, that thoſe cities, which, during this war, had joined with the enemy, ſhould be all razed, and their territories be given to the Roman allies; making a particular grant to the citizens of Utica of the whole country lying between Carthage and Hippo. All the reſt they made tributary, and reduced it into a Roman province, whither a prætor was ſent annually. See Carthage.

Such was the termination of the third Punic war; and ſuch was the final cataſtrophe of the Carthaginian ſtate, in the year B. C. 146; after it had ſubſiſted, through various viciſſitudes, for 737 years. Rollin's Anc. Hiſt. vol. i. Rollin's Rom. Hiſt. vols. iii, iv, v. Anc. Univ. Hiſt. vols. xv, xvi.

CARTHAGO, in *Ancient Geography*, a town of Aſia, in Greater Armenia, called afterwards *Artaxata*; which ſee.

Carthago *Vetus*, a name given by Ptolemy to a town in the interior of Spain, in the country of the Ilercaons, ſituate on this ſide of the Ebrus.

Carthago, or Cartago, in *Geography*, a town of New Spain, in North America, in the province of Coſta Rica, being a biſhop's ſee and the ſeat of a Spaniſh governor; formerly conſiderable, but now much reduced; 360 miles W. of Panama. N. lat. 9° 5′. W. long. 83°.

CARTHAMUS, in *Botany*, (either from Karten, the name given in Morocco to the original ſpecies, or from καθαίρω, *purgo*, on account of its purgative quality. Tournefort prefers the latter, but Ray aſſerts that the former is the true etymology.) Brunfels. Tragus. Fuchs. J. and C. Bauh. Ray. Gerard. Tournef. Cl. 12. §. 3. gen. 1. tab. 258. Linn. gen. 931. Schreb. 1261. Willd. 445. Gært. 929. Juſſ. p. 174. Vent. vol. ii. p. 496. Claſs and order, *ſyngeneſia polygamia æqualis*. Nat. ord. *Compoſitæ capitatæ*, Linn. *Cinarocephalæ*, Juſſ.

Gen. Ch. *Calyx common* ovate, imbricated; ſcales with lateral and terminal ſpines, and in moſt ſpecies with a foliaceous appendicle at their ſummit. *Cor. common* uniform; florets all androgynous, equal, monopetalous, funnel-ſhaped; border five-cleft, erect, nearly equal. *Stam.* Filaments five, capillary, very ſhort; anthers united into a tubular cylinder. *Piſt.* Germ very ſhort; ſtyle filiform, longer than the ſtamens. *Peric.* none, except the cloſing calyx. *Seeds* ſolitary;

tary; down none, or chaffy. *Recep.* flat, hairy; hairs longer than the ſeeds.

Eſſ. Ch. Outward calyx-ſcales with more than one ſpine. Lam.

Sp. 1. C. *tinctorius*, baſtard ſaffron, or ſafflower, Linn. Sp. Pl. 1. Mart. 1. Willd. 1. Gært. tab. 161. fig. 2. Lam. Ill. Pl. 661. fig. 3. Carthamus officinarum, Tourn. Bauh. pin. "Leaves ovate, entire, ſerrate-aculeate." Linn. "Stem perfectly ſmooth; leaves ovate, entire, ſpinous-toothed; ſeeds naked." Willd. *Root* annual. *Herb* ſmooth in all its parts. *Stem* about two feet high, erect, cylindrical, woody, branched toward the ſummit. *Leaves* ſimple, entire, acuminate, veined, with ſpinous teeth at their edges; root-leaves oblong, narrowed at the baſe; ſtem-leaves ſmall, ovate, half-embracing the ſtem. *Flowers* rather large, terminal, ſolitary; calyx-ſcales broad at the baſe, flat, reſembling the leaves; florets of a fine ſaffron colour. *Seeds* white, naked. A native of Egypt and the warmer parts of Aſia. The ſeeds have a purgative quality, and are ſaid to be particularly uſeful when the firſt paſſages are ſurcharged with a thick viſcous mucus. They are a favourite food of parrots, on whom they do not produce a ſimilar effect. The flowers are ſuppoſed to have the ſame medicinal properties as ſaffron: but they are chiefly uſed as a material for dyeing ſilk and cotton ſtuffs, to which they give a beautiful, but fugitive roſe-colour. A red pigment is likewiſe prepared from the ſtamens, uſed by painters, and known as a coſmetic rouge by the Pariſian ladies, under the name of vegetable rouge, Spaniſh vermillion, or lake of carthamus. 2. C. *flaveſcens*, Willd. 2. (C. orientalis, Tourn. cor. 33.) "Stem perfectly ſmooth; leaves oblong, entire, ſpinous-toothed, ſeeds crowned with down." Willd. *Root* annual. *Stem* erect, white, branched. *Leaves* oblong, narrower than thoſe of C. tinctorius, ſeſſile, undivided, toothed; teeth ſpinous; ſpines awl ſhaped, yellowiſh, long. *Florets* yellow. A native of Armenia. 3. C. *perſicus*, Willd. 3. Deſfont. "Stem perfectly ſmooth; leaves lanceolate, entire, ſpinous-toothed; outer calyx-ſcales longer than the flower, ſpreading, ſpinous-toothed at the baſe." *Root* annual. *Spines* white. A native of Perſia. 4. C *dentatus*, Willd. 4. Vahl. ſymb. 1. tab. 17. Forſk. deſcrip. 217. (Cnicus atractylidis folio, flore purpuraſcente, Tourn. Cor. 33.) "Stem villous; leaves pubeſcent, lanceolate, entire, ſpinous-toothed, inner calyx-ſcales ſomewhat roundly dilated at the ſummit, ſcarious, toothed. A native of Aſia Minor. 5. C. *lanatus*, yellow diſtaff thiſtle, or woolly carthamus, Linn. 2. Mart. 2. Lam. 2. Willd. 5 (Cnicus atractylis lutea dictus, Tourn. 451. Atractylis lutea, Bauh. pin. 379. Atractylis fuſus agreſtis, Gært. tab. 161. fig. 2. Chardon beni of the Pariſians.) "Stem hairy, woolly towards the top; lower leaves pinnatifid, upper ones embracing the ſtem, toothed." Linn. "Stem woolly; lower leaves pinnatifid, toothed; upper ones embracing the ſtem, pinnatifid, toothed." Willd. *Root* annual. *Stem* about two feet high, upright, cylindrical, branched towards the ſummit, cobwebbed between the bractes. *Leaves* oblong, ſpinous. *Flowers* yellow, ſolitary at the end of each branch, forming all together a kind of corymb; outer ſcales of the calyx foliaceous, reticularly nerved, pinnatifid-ſpinous, very prickly; inner ones cartilaginous, appendicled, ciliated, ending in a ſharp ſpine; receptacle beſet with briſtle ſhaped chaff. *Seeds* inverſely pyramidal; thoſe in the circumference differing a little in ſhape from thoſe of the circumference. Lam. and Gært. The leaves are rather bitter, and are ſometimes uſed as a febrifuge and ſudorific. A native of uncultivated ground and the borders of fields in the ſouth of France, Spain, and Italy, where the women uſe its ſtalks for diſtaffs. 6. C. *creticus*, Linn. 3. Mart. 3. Lam. 3. Willd. 6. (Cnicus creticus flore leucophæo, Tourn. Cor. 33.) "Stem nearly even; calyxes a little woolly; florets about nine; lower leaves lyrate; upper ones half-embracing the ſtem, toothed." Linn. "Stem even; calyxes nearly ſmooth; flowers whitiſh." Lam. *Root* annual. *Stem* near four feet high, very white. *Leaves* ſtiff, deeply indented, armed with ſtrong ſpines. *Florets* few, whitiſh, and according to Haller with five black lines at the opening, which divide and make the edges of the ſegments black. Haller alſo aſſerts that the radical florets of this and the preceding ſpecies are neuter and abortive, whence Juſſieu refers them both to his genus calcitrapa, formed from the centaurea of Linnæus. Gathered by Tournefort in the Iſland of Candia, who ſent the ſeeds to the royal garden at Paris. 7. C. *pectinatus*, Willd. 7. Deſf. Atl. tab. 228. "Stem villous; calyxes ſmooth; leaves pectinate toothed, ſpinous; lower ones linear-lanceolate; upper ones ovate." Lam. *Root* perennial. *Leaves* ſmooth. *Flowers* in a corymb; calyx-ſcales ſpinous-ciliated on each ſide; awl ſhaped and pungent at the ſummit. Deſf. A native of uncultivated mountains in Barbary. 8. C. *multifidus*, Willd. 8. Deſf. Atl. tab. 227. "Stem ſomewhat villous; lower leaves pinnatifid; ſegments gaſh-toothed, ſpinous; upper ones ovate-lanceolate, ſpinous-toothed." *Flowers* in a corymb; calyx-ſcales ciliate-ſpinous at the edges, awl-ſhaped at the tip. Deſf. A native of uncultivated hills about Algiers. 9. C. *tingitanus*, Linn. 4. Mart. 4. Willd. 9. (Carduus cæruleus erectus, Moriſ. hiſt. tab. 34. fig. 19.) "Root-leaves pinnate; ſtem-leaves pinnatifid; ſtem one flowered." Linn. *Root* perennial. *Stem* a foot and half high, ſeldom branched. *Leaves* narrow-ſpear-ſhaped, deeply ſerrated; each of the ſerratures ending in a ſharp point. *Flowers* blue; ſcarcely diſtinct from the next ſpecies. Linn. A native of Barbary, about Tangier. 10. C. *cæruleus*, Linn. 5. Mart. 5. Lam. 4. Willd. 10. (Onobroma cæruleum, Gært. tab. 160. fig. 7. Cnicus cæruleus aſperior, Bauh. pin. 378. Tourn. 350. Cn. alter, Cluſ. hiſt. 2. p. 152. Lob. ic. 2. p. 19.) "Leaves lanceolate, ſpinous-toothed; ſtem generally one-flowered." Linn. *Root* perennial. *Stem* ſingle, purpliſh, hairy and channelled. *Leaves* covered with a ſhort, hairy down. *Flowers* blue; outer calyx-ſcales broad, long, with ſharp ſpines on their edges; inner ones narrow, terminated with a ſharp thorn. A native of Spain and the coaſt of Barbary. Miller aſſerts that it is extremely different from the preceding: but La Marck obſerves, that though the tingitanus of Linnæus may perhaps be a diſtinct ſpecies, Moriſon's carduus cæruleus appears to him to be only a variety of the preſent. 11. C. *helenoides*, Willd. Deſf. Atl. tab. 230. "Stem generally one-flowered; leaves ovate; lower ones quite entire; upper ones ſlightly toothed, not ſpinous." *Root* annual. *Leaves* ſmooth, embracing the ſtem. *Flowers* yellow; calyx-ſcales ſerrated, a little ſpinous. A native of corn fields in Barbary, near Maſcar. 12. C. *pinnatus*, Willd. 12. Deſf. tab. 229. "Stem one-flowered; leaves pinnate; pinnæ often trifid, ſpinous ſerrated; inner calyx-ſcales ſcarious and toothed at the tip." *Root* perennial. *Flowers* blue. A native of Barbary. 13. C. *carduncellus*, Linn. 7. Mart. 7. Lam. 5. Willd. 14. (Cnicus cæruleus humilis montis Lupi, Tourn. 451. Carduncellus, Moriſ. tab. 33. fig. 15.) "Stem-leaves linear, pinnate, the length of the plant." Linn. "Stems weak, one-flowered; leaves long, ſcarcely ſpinous; root-leaves lyrate; ſtem-leaves pinnate; pinnæ narrow, decurrent." Lam. *Root* perennial. *Stems* ſeveral, about ſix inches high, ſimple, ſometimes a little woolly. *Flower* blue, large, terminal: outer calyx-ſcales foliaceous, inner ones ſmooth, ciliated at their ſummit, and terminated by a ſmall ſcarious appendage; down of the ſeed capillary, unequal, deciduous. A native of the fouth of France. 14. C. *mitiſſimus*, Linn. 6. Mart. 6. Willd. 13. (C. humilis, Lam 6.?) "Leaves not fpinous; root-leaves toothed; ftem-leaves pinnate." Linn. "Generally ftemlefs; leaves fpreading on the ground; flower large." Lam. *Root* perennial. *Stem* fometimes none; fometimes four inches high, fmooth, flightly ftriated, with one or two leaves. *Root-leaves*, fome lanceolate, dilated at the end, and very fmooth, toothed from the middle to the end; teeth turned upwards, fharp, ending in a fmall thorn; others pinnatifid; pinnæ linear-lanceolate, refalcated, quite entire, fome of them eared at the bafe underneath. *Stem-leaves* interruptedly pinnatifid. *Flower* bright blue; calyx large; outer fcales foliaceous, concave, fpinous-ciliated, often quite entire, feldom laciniated, and generally deftitute of confpicuous veins or nerves; inner ones narrower, obtufe; membranous, dilated, and ciliated at the tip. *Down* of the feed capillary. Gouan. A native of France. 15. C. *arboreſcens*, Linn. 9. Mart. 8. Lam. 7. Willd. 15. (Cnicus hifpanicus arboreus, Tourn. 451.) "Leaves fword fhaped, finuate-toothed." Linn. *Root* perennial. Whole plant pubefcent. *Stem* fix feet high, firm, ever-green. *Leaves* clafping the ftem, green, veined, very fpinous at their edges; lower ones near a foot long, finuated, or pinnatifid, with fpinous teeth. *Flower* moft commonly folitary, yellow, of a pleafant fmell; outer calyx-fcales foliaceous, fpinous; inner ones ciliated; down of the feed capillary. A native of Spain. 16. C. *maculatus*, Lam. 8. (Carduus marianus, Linn. Eng. bot. 976. Curt. Lond. tab. 54. Silybum marianum, Gært. tab. 162. fig. 2.) "Leaves finuated, toothed-fpinous, embracing the ftem; calyx-fcales appendicled, fpinous at the margin and tip." Lam. *Root* annual. *Stem* five or fix feet high, branched, furrowed, fmooth. *Leaves* large, deep green, beautifully variegated with milk-white veins; root-leaves pinnatifid; ftem-leaves alternate, recurved, oblong, acute, repand, generally fmooth, ciliated at the edge with unequal fpines. *Flowers* purple, terminal, folitary, large, on naked peduncles; calyx-fcales very different from thofe of carduus, diftinctly appendicled, armed with lateral and terminal fpines. A native of road fides, &c. in England, France, and other parts of Europe. There is a variety not unfrequent in the neighbourhood of London without variegated leaves. The common fort was held in great veneration by the phyficians and botanifts of the dark ages, having, as they imagined, derived its white veins from the milk of the Virgin Mary, which accidentally dropt upon it. Its root, leaves and feeds are fudorific, cooling, and diuretic. It has alfo been recommended as a pectoral, and is faid to have been taken with effect in pleurify. 17. C. *corymboſus*, Linn. 8. Mart. 10. Lam. 9. (Chamæleon niger, Bauh. pin. 380. Dalech. hift. 1454. Lob. ic. 2. p. 5. Carduus chamæleon, Morif. tab. 33. fig. 17. Brotera corymbofa, Willd.) "Flowers in a corymb, numerous." Linn. Whole plant formidably fpinous. *Root* perennial. *Stem* from fix to nine inches high, upright, channelled, branching into a corymb at its fummit. *Root-leaves* rather large, fpreading on the ground, dark green, fmooth, deeply divided; divifions pinnatifid, toothed and fpinous. *Stem-leaves* fmall, oblong, feffile; armed at their edges with fhort, ftiff, double fpines. *Flowers* fmall, of a clear blue colour, (white, Miller), forming with their bractes a denfe clufter at the ends of the branches; calyx oblong; fcales armed with fpines at their edges and fummit. A native of the fouth of Italy, Romania, and Sardinia. It has the habit of echinops, and according to Willdenow, properly belongs to the order fegregata, where he has placed it as a diftinct genus next to echinops, but La Marck afferts that it has all the characters of carduus, and ought not to be feparated from the other fpecies of this genus. No author befides Willdenow has mentioned a proper calyx to each flo[illegible] C. *caneſcens*, Lam. 10. (C. acarna, Juff. Cni[illegible] Linn. 7. Mart. 5. Willd. 8. Cnicus polycephalus, Tourn. 451, &c. Acarna major caule foliofa, Bauh. pin. Chamæleon falmanticenfis, Cluf. hift. 2. p. 155. Lob. ic. 2. p. 17.) "Leaves narrow-lanceolate, decurrent, toothed, armed with yellowifh fpines; calyxes conical, woolly; fcales pinnate-fpinous near the tip." Lam. *Root* perennial. *Stem* a foot and half high, erect, winged, branched, forming a corymb at its fummit. *Leaves* whitifh. *Flowers* purple, oblong or conical, cluftered and feffile at the fummits of the branches, furrounded by bractes; florets fmall; calyx woolly; fcales terminated by an appendage, armed with yellowifh lateral and terminal fpines. A native of Spain and the fouth of France. 19. C. *magellanicus*, Lam. 14. "Leaves linear, quite entire, fmooth; ftem herbaceous, one-flowered." *Stem* fix or feven inches high, fimple. *Leaves* fmooth, without fpines; lower ones long, numerous, growing near together. *Flower* terminal, fmall, naked; outer calyx-fcales ovate, fmooth, a little appendicled, with very fhort lateral fpines. Found in the Straits of Magellan by Commerfon. 20. C. *ſalicifolius*, Linn. Jun. Supp. p. 550. Mart. 9. Lam. 15. Willd. 16. "Stem fhrubby; petioles fpinous; leaves lanceolate, entire, downy underneath, prickly at the tip; branches one flowered." *Branches* long, whitifh, cottony. *Leaves* fcattered, nearly feffile, fmooth and veined above, cloathed with a white cottony, or filky procumbent down underneath, terminated by a feeble fpine. *Flowers* white, folitary, terminal, naked; calyx fhort; fcales imbricated, appendicled, white on the outfide, bordered with fpinous teeth; down of the feed feathery, on which account Ventenat is inclined to think it an atractylis. A native of the Ifland of Madeira. La Marck, Encyc. vol. i. p. 639, 640, has removed atractylis cancellata and gummifera of Linnæus to this genus; but his fucceffor Poiret has remanded them back again to their former ftation. See Encyc. vol. vi. p. 29, 30, fub Quenouillette and Atractylis of this dictionary.

Obf. Gærtner makes *naked feeds* an effential part of the generic character. His carthamus of courfe includes only the firft fpecies, all the others having their feeds crowned with down; and even in that, the feeds are faid by Juffieu, Ventenat, and du Tour, not to be naturally naked, though the down, being extremely caducous, has efcaped the notice of moft authors.

*Propagation and Culture.*—The firft fpecies has been cultivated in Egypt from the earlieft ages for the ufe of dyers. From 16 to 18,000 hundred weight of flowers is the prefent average annual produce; feven eighths of which are exported to Europe; the reft is confumed in the country and other parts. It was not known in Italy in the time of the elder Pliny, but it is faid by Allioni to be now found apparently wild, or at leaft perfectly naturalized in the neighbourhood of Nice. It is cultivated with fuccefs in fome parts of Germany, where its feeds come to compleat maturity; and was introduced into England, as appears from Turner's herbal, as early as 1551. In the year 1683, twenty-five acres in the vale of Evefham, in Gloucefterfhire, were fowed with its feed, and the produce was fuch as might have juftified a farther trial. No attempt of the kind, however, has fince been made; and there is perhaps reafon to apprehend that in our variable climate, and with our frequent wet fummers, the crop would always be uncertain; for the quality of the flowers is confiderably impaired if they are expofed to rain in the interval between their opening and being gathered for uſe. In Germany it is ſown in the lighteſt land, which has always a double fallow given to it, firſt to deſtroy the weeds, and afterwards to make it fine. After it has been fallowed a ſummer and a winter, and has been ploughed and harrowed four times, it receives its laſt ploughing and harrowing in the latter end of March. The ſeeds are then ſcattered thinly in drills, made with a ſmall plough, about a foot and half from each other, and the earth is drawn into them with a harrow, whoſe teeth are little more than an inch long: a roller is finally drawn over the ground to ſmooth and to ſettle it. After the plants are come up they are hoed three times, about five or ſix weeks between each time; and as ſoon as the flowers begin to open, the field is gone over once a week to gather ſuch as are ready. There is uſually a ſucceſſion of flowers for five or ſix weeks; but great care ſhould be taken that there be no dew upon them when they are gathered. They are immediately dried in a kiln, and may then be preſſed cloſe without fear of detriment. In Spain this plant is cultivated in their gardens, as marigolds are in England, to give a colour to their ſoups, olios, and other viands. Conſidered merely as an ornament, it is worthy of a place in the borders of our large gardens, as it continues in flower eight or ten weeks. The ſeeds ſhould be ſown about the beginning of April, in the ground where the plants are intended to remain, for the roots are injured by tranſplanting. Moſt of the other ſpecies will ſtand our winter in the open ground, but ſeveral of them will ſcarcely ripen their ſeeds; ſuch of them as are perennial may, however, be readily increaſed by parting the roots. See SAFFLOWER.

CARTHAMUS *Africanus fruteſcens*, Walth. hort. See ATRACTYLIS *oppoſitifolia*.

CARTHARA, in *Ancient Geography*, a town of Meſopotamia.

CARTHEUSER, JOHN FREDERIC, in *Biography*, profeſſor of medicine at Francfort on the Oder, acquired conſiderable reputation about the middle of the laſt century, by ſeveral very luminous works on the ſubjects of botany and pharmacy. The principal of theſe are "Rudimenta Materiæ medicæ rationalis." Francof. 8vo. 1741, reprinted in 1749, much enlarged and improved, in two volumes 8vo. Beſides deſcribing the ſimples, and the method of preparing and compounding them, the author has given the reſult of his own experience of their virtues. "De Genericis quibuſdam Plantarum Principiis, hactenus plerumque neglectis." Francof. 1754, 8vo. A valuable work, Haller ſays, in which the author introduces ſeveral articles not before found in ſimilar publications, particularly of the trees producing wax, a ſubſtance like butter, and a kind of ſuet. The trees are natives of China. Beſides the above, there is a variety of diſſertations, moſtly on intereſting ſubjects. The titles, with ſhort accounts of them, are given in Haller's Bib. Botan. See alſo Eloy. Dict. Hiſt.

His two ſons, Frederic Auguſtus, and William, became alſo doctors in medicine, under the auſpices of their father. The principal of the works left by them are, "Elementa Mineralogiæ ſyſtematicè diſpoſita." Francof. 1755, 8vo, by the elder; and "Diſſertationes phyſico-chemico-medicæ, de quibuſdam materiæ medicæ ſubjectis," 8vo. 1774; and "Diſſertationes nonnullæ ſelectiores, phyſ. chem." 8vo. 1775, including ſome written by the father, and by other writers.

CARTHUSIANS, in *Eccleſiaſtical Hiſtory*, a branch of the BENEDICTINS, an order of religious, inſtituted by S. Bruno, about the year 1084 (ſome ſay in 1080, and others in 1086), remarkable for the auſterity of their rule, which obliges them to a perpetual ſolitude; a total abſtinence from fleſh even at the peril of their lives; and to feed on bread, water, and ſalt, one day in every week; and abſolute ſilence, except at certain ſtated times.

Their houſes were uſually built in deſerts, their fare coarſe, and their diſcipline ſevere. It is obſerved, that the monaſtical piety is ſtill better preſerved in this, than in any of the other orders. M. l'Abbé de la Trappe, however, endeavours to ſhew, that the Carthuſians do not live up to the auſterity enjoined by the ancient ſtatutes of Guigues, their fifth general. M. Maſſon, general of the order, anſwers the abbé; and ſhews that what he calls the ſtatutes, or conſtitutions of Guigues, are, in reality, only cuſtoms compiled by father Guigues; and that they did not become laws till long after.

The word is formed from *Carthuſianus*, or *Carthuſienſis*, a denomination given them in Latin, from a village in Dauphiny called *Chartreuſe*, in Latin *Cartuſium*, *Caturſium*, as ſome ſay, where the firſt monaſtery of this kind was erected. Hence the French call the religious of this order *Chartreu*, and their convents *Chartreuſes*; an appellation which alſo appears to have anciently obtained in England; whence the name of that celebrated hoſpital, or rather college, in London, the Charter-houſe; by corruption from *Chartreuſe*.

The Carthuſian habit is all white within, their ſcapular being joined in the ſides by two pieces of the ſame ſtuff. They wore a hair ſhirt next their ſkin. Their prior and procurator, who may go abroad upon the neceſſary affairs of the houſe, appear in a black cloak down to the ground, and a black hood over the white one; the hood not round, but tapering to a point.

There are few nuns of this order. There have, however, been ſome female Carthuſian convents; but the increaſe of them was prohibited in 1368; ſo that there remained only five, four in France, and one at Bruges in Flanders. As the rigorous diſcipline of the Carthuſians is altogether inconſiſtent with the tenderneſs and delicacy of the female ſex, the auſterity of the order has been diminiſhed in the female convents; and it was more particularly found neceſſary to abrogate thoſe ſevere injunctions of ſilence and ſolitude, that are ſo little adapted to the known character and genius of the ſex. They were brought into England by Henry II. about the year 1180, and had only nine houſes; their firſt houſe being at Witham in Somerſetſhire.

CARTHUSIAN *powder, poudre des Chartreux*. See KERMES *mineral*.

CARTIER, or QUARTIER, JAMES, in *Biography*, an eminent navigator, was born at St. Malo's, where he diſtinguiſhed himſelf as a ſkilful pilot. Francis I. employed him to proſecute diſcoveries in Canada, for which purpoſe he made a voyage thither in 1534, examined the country with great attention, and gave an exact deſcription of all its iſlands, coaſts, capes, bays, &c. which was of great uſe to ſubſequent navigators.

CARTILAGE, in *Anatomy*, is a ſemipellucid ſubſtance, of a milk-white or pearly colour, entering into the compoſition of ſeveral parts of the body. It holds a middle rank in point of firmneſs, between bones, or hard parts, and the ſofter conſtituents of the human frame. It appears, on a ſuperficial examination, to be homogeneous in its texture: for, when cut, the ſurface is uniform, and contains no viſible cells, cavities, or pores, but reſembles the ſection of a piece of glue. The cartilages of the ribs, however, particularly in adults, preſent a kind of fibrous appearance in their texture: and Dr. Hunter has diſcovered, by microſcopical examination, that the cartilaginous cruſts of articular ſurfaces are compoſed of ſtraight parallel fibres directed towards the cavity of the joint. (Philoſ. Tranſact. N° 470.) This ſubſtance poſſeſſes a very high degree of elaſticity ; which properly diſtinguiſhes it from all other parts of the body. Hence it enters into the compoſition of parts, whoſe functions require the combination of firmneſs, with pliancy and flexibility : the preſervation of a certain external form, with the power of yielding to external force or preſſure.

Cartilages are covered by a membrane, reſembling in texture and appearance, as well as in its office, the perioſteum of bones : this is termed the perichondrium. They receive arteries and veins from this membrane : theſe veſſels, however, have never been demonſtrated in the cartilaginous cruſts of articular ſurfaces. Abſorbent veſſels cannot be actually ſhewn : but their exiſtence is abundantly proved by many phenomena. The converſion of cartilage into bone is alone ſufficient for this purpoſe. The cartilaginous ſubſtance is gradually removed as the formation of the bone advances. In affections of the joints their cartilaginous coverings are often both entirely deſtroyed, or partially removed ; which appearance can only be aſcribed to the action of abſorbent veſſels. It does not ſeem to poſſeſs nerves, as it is entirely deſtitute of ſenſibility.

Its colour is not affected by feeding an animal with madder.

It reſiſts the effects of preſſure from contiguous diſeaſe, longer than the bones, or the ſoft parts of the body. Dr. Hunter has obſerved this in the cartilages of the ribs ; and the ſame fact is alſo witneſſed in thoſe of the vertebræ, in the caſe of aneuryſm in the deſcending aorta.

It does not exfoliate like the ſubſtance of bones.

When deſtroyed, it is never reproduced. We have obſerved a curious exemplification of this fact in caſes of unreduced luxation. The head of the diſlocated bone has its cartilaginous cruſt gradually worn away by friction againſt the ſurrounding parts ; this is never replaced ; but the ſubſtance of the bone itſelf becomes highly poliſhed. The new cavity, which is ultimately formed for it in the bone, on which it lies, has no cartilaginous ſurface, but is poliſhed in the ſame way.

The thinner cartilages of the body are reſolved by maceration into a kind of fibrous ſubſtance : e. g. thoſe of the organs of ſenſe. Theſe are the ſofteſt, and moſt flexible in the body. Thoſe of the ribs, if boiled or macerated for ſome months, ſeem to conſiſt of oval laminæ, ſurrounding each other concentrically, and connected by tranſverſe fibres. Theſe are much more denſe and elaſtic. The intervertebral and interarticular cartilages, with that of the ſymphyſis pubis, obviouſly contain a conſiderable intermixture of tendinous fibres ; and may be reſolved into a cellular texture.

Digeſtion, in a cloſe veſſel, diſſolves cartilages, and converts it into a jelly.

The cartilages of the body are divided, by anatomiſts, into two kinds : the temporary and the permanent. The former are confined to the earlier ſtages of exiſtence ; the latter commonly retain their cartilaginous ſtructure throughout every period of life. The temporary cartilages are thoſe in which the bones of the body are formed. They are hence called by Latin writers Oſſeocentes. All the bones in the body, except the teeth, are formed in a nidus of cartilage. The form of the bone, with its various proceſſes, is accurately repreſented in theſe cartilaginous primordia ; and it is the ſubſtance alone which changes. In the early periods of fœtal exiſtence, theſe cartilages are of a ſoft and gelatinous texture : they become firmer and harder as the growth of the ſubject advances. No difference is obſerved in the cartilage, whether a long or a broad bone is to be formed in it ; whether the future bone be of the reticulated or compact ſtructure. As the oſſific matter is depoſited, the cartilaginous ſubſtance is abſorbed. The epiphyſes are ſtill connected to the body of the bone by cartilaginous cruſts, after they are completely oſſified ; but this part is ultimately conſolidated.

The permanent cartilages are of various kinds. The external ear, the external aperture of the noſtrils, and the eyelids, are compoſed of a thin and flexible cartilage, incloſed in a duplicature of the common integuments. See Eye, Ear, and Nose.

The larynx is entirely compoſed of this ſubſtance, and the trachea, with its branches, is furniſhed with pieces of cartilage, by which theſe tubes are kept permanently open, for the ready paſſage of air to and from the lungs. See Larynx and Trachea.

Portions of a denſe and elaſtic cartilage are annexed to the anterior extremities of the ribs ; and in the ſeven firſt ribs are articulated to the ſide of the ſternum. The elaſticity of theſe parts conſtitutes a chief inſtrument of reſpiration, by reſtoring the ribs to their former poſition when the action of the intercoſtal muſcles has ceaſed.

Contiguous bones are ſometimes united by the intervention of cartilage : as the two oſſa pubis, the ſacrum and oſſa innominata, and the two bones of the ſternum. This ſpecies of junction is technically termed ſynchondroſis.

The bodies of the vertebræ are joined by large maſſes of a peculiar ſubſtance, partaking of the properties and appearance of cartilage and ligament ; which allow of the motions of theſe parts on each other, without weakening the ſupport which is afforded to the upper parts of the body in general, and to the head in particular, by the vertebral column. Theſe cartilages impart a great elaſticity to the ſpine ; by which the effects of concuſſion, from jumping, from falls, &c. are weakened, and deſtroyed, before they can be propagated to the head. When the body has been long in an erect poſition, the compreſſion of theſe cartilages by the weight of the upper parts of the body, diminiſhes the height of the perſon. They recover their former length, when freed from the preſſure of the ſuperincumbent parts. Hence a perſon is taller when he riſes in a morning, than after ſuſtaining the fatigues of the day ; and the difference has ſometimes amounted to an inch. (Philoſophical Tranſactions, No. 383. Hiſt. de l'Acad. des Sciences, an. 1725.)

Cartilages are ſometimes interpoſed between the articular ſurfaces of bones ; where they fill up irregularities, that might otherwiſe impede the motions of the part ; and increaſe the ſecurity of the joint, by adapting the articular ſurfaces to each other. Inſtances of this are found in the articulation of the lower jaw ; in the connection of the clavicle with the ſternum, and in the knee-joint. Theſe are called interarticular cartilages.

The articular ſurfaces of bones are in every inſtance covered by a thin cruſt of cartilage, having its ſurface moſt exquiſitely poliſhed, by which all friction in the motions of the joint is avoided, and the ends of the bones glide over each other with the moſt perfect facility.

Theſe permanent cartilages become not unfrequently more or leſs oſſified in old perſons. The cartilages of the larynx, particularly the thyroid and cricoid, and thoſe of the ribs, are generally affected in this way in an advanced age : yet ſome inſtances have been obſerved, where this change had not taken place, even in very old ſubjects, as, e. g. in the caſe of Thomas Parr, who was examined by Harvey, (Sectio Thomæ Parre, Lond. 1669, 8vo.) and of another perſon of 130 years old by Keill. (Phil. Tranſ. No. 306.) The ſymphyſis of the pubis, and that of the ilium and ſacrum, are very rarely affected indeed ; and oſſific union of the bodies of the vertebræ is alſo very uncommon.

The reader may conſult on the ſubjects of this article, J. G. Haaſe Diſſert. de Fabricá Cartilaginum, Lipſiæ, 1767. 4to. and the firſt vol. of Soemmerring's work, De Corporis humani Fabricá.

CARTILAGINOUS *fiſhes*, *Piſces Cartilaginei*, and *Les Poiſſons Cartilagineux* of the French. The fiſhes of this tribe are diſtinguiſhed by having, as their name implies, a cartilaginous inſtead of bony ſkeleton.

The cartilaginous fiſhes are numerous, embracing the whole of the two laſt orders of Ichthyology, the *Branchioſtegi*, and *Chondropterygii*. in which the following genera are contained, Mormyrus, Oſtracion, Tetrodon, Diodon, Syngnathus, Pegaſus, Centriſcus, Baliſtes, Cyclopterus, Lophius, Acipenſer, Chimera, Squalus, Raja, Petromyzon, and Gaſtrobranchus (*myxine*, Linn.)

Linnæus ſeparated the cartilaginous from the other fiſhes, and placed them in the claſs Amphibia, where they conſtituted the order Nantes. This diſtribution was made under the ſuppoſition of the cartilaginous fiſhes being furniſhed both with lungs and gills, an idea apparently confirmed by the obſervations of Dr. Garden of South Carolina, who at the deſire of Linnæus examined the organs of the genus Diodon, and found, as he conceived, both external gills, and internal lungs. Theſe ſuppoſed lungs, however, have been ſince aſcertained by naturaliſts to be only a peculiar modification of the gills, and it therefore now appears that this cartilaginous tribe are, in reality, fiſhes, differing principally, if not entirely, from other fiſhes in having, as before mentioned, a cartilaginous ſkeleton. They differ from the generality of other fiſhes, in having the gills deſtitute of bony rays, or in the gills being cartilaginous ; and they are deficient, for the moſt part, at leaſt, of obvious ſcales, thoſe being either very deciduous, minute, or ſo deeply imbedded in the ſkin as to be ſcarcely viſible : in many of the cartilaginous fiſhes there is not even the ſlighteſt appearance of ſcales on the ſurface of the ſkin. See FISHES and ICHTHYOLOGY.

CARTILAGINOUS *leaf*, among *Botaniſts*. See LEAF.

CARTILI, in *Antient Geography*, a bay of Africa, where veſſels ſheltered themſelves from the eaſterly wind ; ſituate N.E. of the mouth of the river Chinalaph.

CARTILIS, a place of Africa, in Mauritania Cæſarienſis, between Cartennæ and the colony of Cæſarea, according to the Itinerary of Antonine.

CARTINAGA, a town of India, on this ſide of the Ganges. Ptolemy.

CARTISMANDUA, in *Biography*, queen of the Brigantes in Britain about the middle of the firſt century, juſtly incurred infamy by cauſing Caractacus, who had put himſelf under her protection with promiſes of ſafety, to be arreſted and delivered up to the Romans, A. D. 49. By this act of treachery, ſhe gained their favour and increaſed her own power and wealth. But afterwards, preferring to her huſband Venuſius, who was eſteemed the beſt warrior among the Britons (Caractacus excepted), his equerry Vellocatus, and advancing him to the partnerſhip of her throne and bed, ſhe occaſioned two contending parties ; one in favour of Venuſius, which maintained his right to the throne, and another which adhered to the intereſt of Cartiſmandua. When ſhe found herſelf likely to be overpowered, ſhe ſought the protection and aſſiſtance of the Romans, who ſecured her ſafety, and in the iſſue of the conteſt made themſelves maſters of the country. Tacitus, Annal. xii. Hiſt. iii.

CARTMEL, in *Geography*, is a market town of Lancaſhire, England, ſeated in a woody vale, near a tract of ſands which run out into the Iriſh Sea. Theſe ſands bear the reſpective names of three rivers, which here diſcharge themſelves into the ocean. To ſhorten the diſtance from one place to another many perſons travel acroſs theſe ſands, but from the danger that attends theſe pathleſs roads, it is found neceſſary for ſtrangers to employ guides, who are conſtantly waiting for that purpoſe. Theſe are employed, and paid, by the government. In the vicinity of the town are ſome high hills, known by the name of Cartmel Fells. Here was formerly a priory, which was founded by William Mareſchall, earl of Pembroke, in the year 1188, for canons regular of the order of St. Auſtin. The church, which originally belonged to this religious foundation, is appropriated to the pariſh, and is a large handſome ſtructure. Its tower is very peculiar, being ſquare for ſome diſtance from the ground, and the upper part ſet diagonally within the lower. The interior of the church is fitted up in a very neat ſtyle, and contains a number of fine, and ancient monuments. The pariſh has five chapels of eaſe, at ſmall places in the vicinity of the town. Here is a free grammar ſchool well endowed, and its buildings were re-erected in 1790. Though Cartmel has no particular manufactories, yet in its vicinity are three very large cotton-mills. Here are two weekly markets, Tueſdays and Saturdays ; and two annual fairs. Cartmel is 16 miles from Lancaſter, and 265 N.W. from London. It contains 140 houſes and 882 inhabitants.

About three miles ſouth of the town are *Cartmel-Wells*, which are reſorted to in the ſummer ſeaſon, and their waters are found ſerviceable in ſcorbutic complaints. A pleaſant walk through the woods of about a mile leads to *Holker-Hall*, the ſeat of lord George A. Cavendiſh. The manſion is ornamented with ſeveral fine pictures by Vandyke, and other maſters.

CARTON, or, as we pronounce it, CARTOON, in *Painting*, a deſign made on ſtrong paper, to be afterwards calqued through, and transferred on the freſh plaſter of a wall, to be painted in freſco.

CARTON is alſo uſed for a deſign coloured, for working in moſaic, tapeſtry, &c. The word, in the original French, ſignifies *thick paper* or *paſte-board*.

In Italian, whence the term ſeems to be derived, *cartone*, or *cartoni*, ſignifying *large paper*, denotes ſeveral ſheets of paper paſted on canvas, on which large deſigns are made, whether coloured or with chalks only. Of theſe cartoons there are many by Domenichino, Lionardo da Vinci, Andrea Mantegna, Michael Angelo, &c. ; but the moſt celebrated performances of this kind are the "cartoons of Raphael" or Raffaello Sanzio, Da Urbino, which are ſeven in number, and form only a ſmall part of the ſacred hiſtorical deſigns executed by this famous artiſt, while engaged in the chambers of the Vatican under the auſpices of pope Julius II. and Leo X. As ſoon as they were finiſhed, they were ſent to Flanders, to be copied in tapeſtry, for adorning the pontifical apartments ; but the tapeſtries were not conveyed to Rome till after the deceaſe of Raphael, and probably not before the dreadful ſack of that city in 1527 under the pontificate of Clement VII. ; when Raphael's ſcholars having fled from thence, none were left to inquire after the original cartoons, which lay neglected in the ſtorerooms of the manufactory. The revolution that happened ſoon after in the Low Countries prevented their being noticed during a period in which works of art were wholly neglected. Theſe ſeven, however, eſcaped the wreck of the others, which were torn in pieces, and of which ſome fragments remain in different collections. Theſe were purchaſed by Rubens for Charles I., but they had been much injured by the weavers. In this ſtate they alſo fortunately eſcaped being ſold in the royal collection, by the diſproportionate appraiſement of theſe ſeven at 300l. and the nine pieces, which were the triumph of Julius Cæſar by Andrea Mantegna, appraiſed at 1000l. The cartoons ſeem to have been little noticed till king William III. built a gallery for the purpoſe of receiving them at Hampton-Court. After having ſuffered much from the damps of the ſituation in which they were placed, they were removed by order of his preſent majeſty king George III. to the queen's palace at Buckingham-houſe, and from thence to the caſtle at Windſor, where they are open to public inſpection. Theſe cartoons are juſtly repreſented as "the glory of England, and the envy of all other polite nations;" and his majeſty is entitled to a tribute of reſpect and applauſe for his care in preſerving theſe precious treaſures. They have been long deſervedly held in high eſtimation throughout Europe by all authors of refined taſte, and by all the admirers of the art of deſign, for their various and matchleſs merit, particularly with regard to the invention, and to the noble expreſſion of ſuch a variety of characters, countenances, and attitudes, as they are differently affected and ſuitably engaged, in every compoſition. The Abbé du Bos, in his treatiſe on poetry and painting, has committed a very groſs error in his developement of one of the characters in this collection. Having deſcribed the carton of the miraculous draught of fiſhes, he points out with propriety the expreſſion of St. Peter, St. John, and other diſciples, and then proceeds to illuſtrate a ſingular character, which he ſeems particularly to admire, for the ſtrength and juſtneſs of the expreſſion; that figure, according to his opinion, being repreſented with a confuſed countenance, and melancholy complexion, and ſeeming to be devoured by black jealouſy, in which perſon (he ſays) it is eaſy to diſtinguiſh Judas. Whereas if this ingenious writer had maturely conſidered the time which Raphael choſe for his ſubject, and which was, as the evangeliſt informs us, the third time of our lord's appearing to his diſciples after his reſurrection, and conſequently ſome weeks after the death of Judas, who hanged himſelf when Chriſt was condemned; or if he had counted the number of figures in the compoſition, which is only eleven and our Lord himſelf, he could never have committed ſo unaccountable an error, as to imagine that Raphael deſerved commendation for being ſo abſurd as to introduce ſo infamous a wretch, at ſuch a point of time, when Chriſt was directing his diſciples to take care of his flock; or for grouping ſuch a perſon among the apoſtles, who, as he was dead before, could not aſſociate with them, and whom they would have avoided, if he had been alive, with abhorrence and deteſtation. The diſcernment and judgment of Raphael could not have allowed him to be guilty of ſo groſs an anachroniſm. "Perhaps the beſt apology, and the trueſt (ſays Pilkington), that can be made for this miſtake of Du Bos, is, that he was much more converſant and better acquainted with the works of Raffaello than with the works of the Evangeliſts. Mr. Fuſeli, however, remarks, that Mr. Pilkington has miſcalculated the number of the cartoons; as he mentions that which repreſents the miraculous draught of fiſhes, and the ſubſequent one of the donation of the keys, with regard to which Du Bos committed his error, as if they were the ſame. Pilkington's Dictionary of Painters by Fuſeli, art. *Raffaello* SANZIO, *Da Urbino.*

CARTOUCH, in *Architecture, Sculpture,* &c. denotes an ornament repreſenting a ſcroll of paper; being uſually in form of a table, or flat member, with wavings; whereon is ſome inſcription, or device, ornament of armory, cypher, or the like. It is nearly akin to a modillion; from which it only differs in this, that the latter is uſed under the cornice in the eaves of a houſe, and the former in wainſcotting within doors. Some workmen call the *cartoozes* DENTILS. The word is French, formed from the Italian *cartoccio*, which ſignifies the ſame. Cartouches are ſometimes drawn on paper, as in the titles of maps, &c. and are ſometimes made of ſtone, brick, plaſter, wood, &c. for buildings.

CARTOUCHES, in *Heraldry*, a name given to a ſort of oval ſhields, much uſed by the popes and ſecular princes in Italy, and others, both clergy and laity, for painting or engraving their arms on. Many ſuppoſe this form derogatory to the honour of the perſon; but though the ſquare ſhield, with the rounded and pointed bottom, is more in uſe with us, as alſo with the French and Germans, yet this is ſuppoſed more truly the figure of the Roman ſhield worn by the ſoldiery, and therefore more ancient and honourable than either that or the indented ſhield of the Germans.

CARTOUCH, in the *Military Art*, a wooden caſe about three inches thick at bottom, and girt round with marline, holding two, three, or four hundred muſquet balls, with eight or ten iron balls weighing one pound each, to be fired from a mortar, gun, or howitzer, for the defence of a paſs, defile, ditch, breach, retrenchment, &c. It ought not to be confounded with the *gargouge, gargouche,* or *gargouſſe*, which is ſimply the caſe or roll of paper, paſte-board, parchment, or flannel, &c. filled with the charge of powder neceſſary for the caliber or bore of the piece or fire arm made uſe of; whereas the cartouch contains, beſides the powder, balls of lead, old nails, chains, pieces of iron, &c. &c., which are put into the piece inſtead of a bullet, whether on a breach or on a retrenchment, in defending a paſs, or againſt an enemy near to you in battle. Thoſe, who make uſe of this ſort of firing, are ſaid to fire with the cartouch, in French *tirer a cartouche.*

CARTOUCHES, in *Artillery*, are made of leather for flinging over the ſhoulders of the matroſſes; who carry in them the ammunition from the magazines or waggons for the uſe of the artillery, when they are either at exerciſe or on actual ſervice.

CARTOUCH *de congé abſolu*, known under the name of *congé d'ancienneté*, or leave of ſeniority, is a ſet form of abſolute, final, or unlimited leave of abſence from military ſervice, inſerted on a ſheet of paper called or known by the name of *cartouche,* on which are expreſſed the merits or deſerts of the military perſon, to whom the diſcharge or *congé abſolu* is granted, whether for having finiſhed the time or number of years he was engaged to ſerve by his contract of enrollment, or on account of the impoſſibility of his finiſhing the ſame through his wounds or infirmities, or for other reaſons, that exempt him definitively from ſervice.

CARTOUCH *de ſoldat, cartouchier,* a cartridge-box, pouch, cartouch. It is a caſe of light wood covered with leather, with a flap over it of the ſtouteſt blackened calf-ſkin, ſufficiently thick and ſubſtantial to bear the wetteſt and ſevereſt weather. The caſe is conſiderably longer than broad, and has two rows of holes in it for about 24 muſquet-cartridges. As it hangs from a buff croſs-belt over the left ſhoulder, and is worn in that manner by the infantry, before the body of the ſoldier a little below the right pocket-hole for the purpoſe of carrying his ammunition, it is made of a form ſomewhat rounded or circular in order to apply equally every where to his body. It is worn by him in this way upon a belt both on ordinary duty and in the time of action. The flap is generally ornamented with a braſs crown, &c.

for the battalion-men; a fuſe for the grenadiers; and a bugle-horn for the light infantry. The pouches or cartridge-boxes uſed by the cavalry are ſmaller than thoſe made uſe of by the infantry. Cartridge-boxes have often been made of iron, but ſeldom or ever are now.

CARTRIDGE, in French *gargouge*, *gargouche*, or *gargouſſe*, and ſometimes, but erroneouſly, *cartouche*, which ſignifies not merely the cartridge and charge of powder as the word *gargouſſe*, *gargouge*, or *gargouche* does, but the whole charge, conſiſting of the cartridge and charge of powder with the bullet, grape-ſhot, caſe-ſhot, chain-ſhot, double-headed ſhot, nails, pieces of braſs or iron, or whatever elſe is diſcharged from the piece by the inflammation of the powder. A cartridge, in the ordinary acceptation of the word, is a caſe or cover holding exactly the charge of powder allotted for any piece, and ſo fitting the bore of the ſame as to be rammed home without difficulty. Cartridges have been made of various ſubſtances, ſuch as paper, paſte-board, parchment, bladders, and flannel. The bottoms of paper-cartridges are apt to remain in the fire-arm or piece, and to accumulate to ſuch a degree as to prevent the priming from reaching the powder, beſides which inconvenience they are attended alſo with others. Paſte-board-cartridges are liable to nearly the ſame objections. The fire ſhrivels up thoſe made of parchment or bladders in ſuch a manner, that they enter into the vent and become ſo hard, that the priming iron cannot ſufficiently clear it. Nothing has as yet been found to anſwer better for cartridges than flannel, which is now generally made uſe of for artillery-ones of all ſorts, becauſe as it does not keep or retain fire it is not apt to occaſion accidents in loading, which the others frequently uſed to do. But as the duſt of powder paſſes through them, parchment covers are ſometimes made and put over them, which are taken off as they are uſed. Flannel cartridges, however, may be rendered much more commodious or manageable, and not only a great deal ſtiffer but alſo proof againſt the duſt of powder penetrating or paſſing through them, by boiling the flannel, of which they are made, in ſize. Without ſome ſuch precaution to ſtiffen them, they are ſo pliable, and when large contain ſo much powder, that it is with difficulty they are put into the pieces. The loading and firing of guns with cartridges are much quicker and leſs liable to accidents than with looſe powder.

The cartridge for a heavy braſs 42 pounder, or an iron 42 pounder for ſervice, uſed to contain, and does now, 14 lb. of powder; that for a heavy braſs 32 pounder uſed to contain, and does now, 10 lb. 11 oz. of powder; that for an iron 32 pounder uſed to contain 9 lb. 4 oz. but contains now 10 lb. 11 oz. of powder; that for a heavy braſs 24 pounder or iron 24 pounder uſed to contain, and does now, 8 lb. of powder; that for a heavy braſs 18 pounder uſed to contain, and does now, 6 lb. of powder; that for an iron 18 pounder uſed to contain 8 lb. but contains now 6 lb. of powder; that for a heavy braſs 12 pounder or an iron 12 pounder uſed to contain, and does now, 4 lb. of pounder; that for a heavy braſs 9 pounder uſed to contain 3 lb. of powder, and that for an iron 9 pounder now contains the ſame weight of powder; that for a heavy braſs 6 pounder uſed to contain 2 lb. 8 oz. of pounder, but now contains only 2 lb. of powder; that for an iron 6 pounder uſed to contain 2 lb. 8 oz. of powder, but now contains only 2 lb. of powder; that for a heavy braſs 3 pounder or for an iron 3 pounder uſed to contain, and does now, 1 lb. of powder; that for a medium braſs 24 pounder uſed to contain, and does now, 8 lb. of powder; that for a medium braſs 12 pounder uſed to contain, and does now, 3 lb. 8 oz. of powder; that for a medium braſs 6 pounder uſed to contain, and does now, 2 lb. of powder; that for a medium braſs 3 pounder uſed to contain the ſame weight of powder as one for a heavy braſs 3 pounder, viz. 1 lb. of powder; and one for a braſs 3 pounder, according to general Deſaguliers' conſtruction, contains the ſame charge of powder now; that for a light braſs 24 pounder uſed to contain, and does now, 5 lb. of pounder; that for a light braſs 12 pounder uſed to contain, and does now, 3 lb. of powder; that for a light braſs 6 pounder uſed to contain, and does now, 1 lb. 8 oz. of powder; and that for a light braſs 3 pounder uſed to contain 12 oz. of powder, but contains now only 8 oz.

There ought not, ſtrictly ſpeaking, to be fixed or determinate charges for guns of different calibres. But they ſhould vary as to the weights and quantities of the powder with the ſervices, to which the guns themſelves are to be applied. And it may with truth be aſſerted, that the charges of powder uſually allotted for cannon are generally greater than what are either proper or neceſſary for them on any ſervice whatſoever. The beſt charges even for one and the ſame piece, when applied to different uſes or ſervices, have never as yet been correctly aſcertained, or even nearly ſo.

*Ball-cartridges*, in French *cartouches*. For the convenience of quick firing, the ſhot is fixed to the cartridge by means of a wooden bottom ſo hollowed or cut into on one ſide as to receive nearly one half of the ſhot, which is faſtened to it by two ſmall ſlips of tin, which paſs or croſs over the ſhot and are faſtened to the bottom, to the other ſide of which the cartridge holding the charge of powder is tied.

The cartridges are likewiſe fixed in the ſame manner to the bottoms of grape ſhot, which are uſed with field pieces, and are called in French *cartouches a grappes de raiſin*.

Cartridge-*box*. See Cartouche *de ſoldat*.

CARTWRIGHT, Thomas, in *Biography*, a learned Puritan divine, was born in Hertfordſhire about the year 1535, and admitted into St. John's college in the univerſity of Cambridge in 1550. Such was the aſſiduity of his application, commenced at college and continued through life, that he allowed himſelf only five hours of ſleep. Upon the death of king Edward VI., he quitted the univerſity, and became clerk to a counſellor at law; but in this ſituation he proſecuted his former ſtudies with unremitting diligence, at every interval of leiſure which occurred. Being afterwards recommended by the gentleman who employed him to Dr. Pilkington, maſter of St. John's college in Cambridge, he was reſtored upon giving ſatisfactory evidence of his abilities and attainments, to that ſeminary of learning, and in 1560 was choſen fellow of his college. From hence he was removed to Trinity college, and on account of his peculiar merit, made one of the eight ſenior fellows. When queen Elizabeth viſited the univerſity in 1564, Mr. Cartwright was much diſtinguiſhed; and in 1570 he was choſen lady Margaret's divinity profeſſor. At this time his popularity as a preacher was ſo great, that when it was his turn to officiate at St. Mary's church, it was neceſſary to take down the windows for the accommodation of the multitude that attended him. The ſentiments concerning church diſcipline, which he delivered in his lectures, were unfavourable to the eſtabliſhed hierarchy, and complaints were preferred againſt him to ſir William Cecil, chancellor of the univerſity, both by archbiſhop Grindal and Dr. Whitgift, who deſired that he and his adherents might be ſilenced. The chancellor, to whom Cartwright wrote in his own defence, ſeemed diſpoſed to treat him with moderation; but his adverſaries renewed their accuſations; and he was cited before the vice chancellor, to give an account of the obnoxious ſentiments delivered in his lectures. Incapable of giving ſatiſfaction, he was ſuſpended from his office as a lecturer, and prevented from obtaining his doctor's degree. In 1571, Dr. Whitgift was appointed vice-chancellor; and by his influence Mr. Cartwright was firſt deprived of his Margaret-profeſſorſhip, and afterwards of his fellowſhip. As danger was apprehended from the diſſemination of his principles in the univerſity, he was reduced to the neceſſity of leaving it and of ſeeking ſubſiſtence in a foreign country. Whilſt he was abroad, he formed an acquaintance with the moſt celebrated divines in ſeveral Proteſtant univerſities, who treated him with great reſpect on account of his learning and character; and he was choſen miniſter to the Engliſh merchants firſt at Antwerp, and afterwards at Middleburg, where he continued two years. His friends in England, however, were anxious for his return to his own country, and he at length yielded to their importunity. Upon his return he found that the proſecution againſt the Puritans continued with unabated violence; and though the authors of a piece in their favour, entitled "An Admonition to the Parliament," had been committed to Newgate in 1572, Mr. Cartwright wrote "A ſecond Admonition to the Parliament," which involved him in a controverſy with Dr. Whitgift, that obliged him to leave the kingdom, whilſt it was the means of advancing his opponent to the biſhopric of Worceſter. During an abſence from his country of five years, he officiated in ſome of the Engliſh factories; and in 1580, James VI., king of Scotland, having an high opinion of his abilities, and learning, offered him a profeſſorſhip in the univerſity of St. Andrew's, which he thought proper to decline. Upon his return to England, he was arreſted as a promoter of ſedition, and thrown into priſon; but being liberated by the intereſt of the lord treaſurer Burleigh, and the earl of Leiceſter, the latter conferred upon him the poſt of maſter of the Hoſpital, which he had founded in Warwick. In compliance with the ſolicitations of ſeveral learned friends at home and abroad, he undertook to write againſt the Rhemiſh tranſlation of the New Teſtament; but ſome time after he had commenced the work, archbiſhop Whitgift, by an arbitrary and unjuſt mandate, prohibited his proſecution of it; the performance, however, was nearly completed; and was publiſhed ſome years after his death. In 1585 ſome new complaint was alleged againſt him, and he was committed to priſon by Dr. Aylmer, biſhop of London; and again in 1591, the ſame prelate ordered him to be lodged in the Fleet, where he was kept in a very cloſe and rigorous confinement. Many applications were made on his behalf, but they were ineffectual till about the middle of the year 1592, when he was releaſed, reſtored to his maſterſhip of the hoſpital at Warwick, and permitted to preach. Towards the cloſe of his life, the zeal with which he had, in the earlier period of it, oppoſed the church, was ſomewhat abated, and he ſeems to have lived on terms of friendſhip with archbiſhop Whitgift, who uſed him kindly and tolerated his preaching at Warwick. Long confinement and application to ſtudy had much impaired his health; and at length terminated his life in December, 1603, in his 68th year. In his private character, he was pious, diſintereſted, and charitable; and though the perſecution againſt him was harſh and ſevere, it originated with that conteſt for ſuperiority, which the intolerant principles of each party would lead them to abuſe, and therefore demands ſome kind of apology from the candour of more enlightened and liberal times. Beſides the works already mentioned, Cartwright wrote "Commentaria practica in totam Hiſtoriam evangelicam," 4to. 1630; reprinted at Amſterdam in 1647; "Commentarii ſuccincti et dilucidi in Proverbia Salomonis," 4to. Amſt. 1638; "Metaphraſis et Homiliæ in librum Salomonis, qui inſcribitur Eccleſiaſtes," 4to. Amſt. 1647; "A Directory of Church-government," 4to. 1644; and "A Body of Divinity," 4to. Lond. 1616. Biog. Brit

CARTWRIGHT, WILLIAM, a poet and divine of the 17th century, was born in 1611 at Northway, near Tewkſbury, in Glouceſterſhire, educated at Weſtminſter ſchool, and elected a ſtudent of Chriſt-church in Oxford, in 1628. Having gone through the uſual courſe of ſtudies, he took orders, and became, as Anthony Wood expreſſes it, "a moſt florid and ſeraphical preacher" in the univerſity; where he performed the office of junior proctor, and alſo that of metaphyſical reader. His poetical purſuits amuſed him in the courſe of theſe graver ſtudies, and procured for him unbounded applauſe. But a malignant fever cloſed his career in his 33d year, December 1643. The king and queen, being at this time in Oxford, teſtified their reſpect for him, by their inquiries during his illneſs, and his majeſty wore black on the day of his funeral. Mr. Cartwright was much diſtinguiſhed both by external and internal endowments, and few perſons ſhared a greater degree of attention and applauſe. Four plays, and ſome other poems, compriſed in one volume, and prefaced by about 50 copies of commendatory verſes, by the univerſity wits, are the principal production on which our author's fame was founded. But his popularity does not ſeem to have been very extenſive or durable; as only one edition of his works was publiſhed, and that is at preſent very little known. He is alſo ſaid to have written ſome Latin and Greek poems, a "Paſſion ſermon," and two or three occaſional poems. Biog. Brit.

CARVA, in *Botany*, a name given by the Indians to one of the kinds of cinnamon-tree. This is of all others the moſt eſteemed amongſt them, and ſerves for the greateſt number of purpoſes. They extract camphor and liquid oil from the roots; they extract oil of cinnamon from the bark, and from the leaves they make another oil, which is called oil of cloves, and ſold as ſuch. The fruits yield them an oil reſembling that of juniper, and afterwards they extract from them a thick, fat ſubſtance, like wax, ſerving them for the making of unguents and plaſters, and alſo for the making of their candles.

CARVAGE, *carvagium*, the ſame with CARRUCAGE.

Henry III. is ſaid to have taken carvage, that is, two marks of ſilver of every knight's fee, towards the marriage of his ſiſter Iſabella to the emperor.

Carvage could only be impoſed on the tenants *in capite*.

CARVAGE alſo denotes a privilege whereby a man is exempted from the ſervice of *carrucage*.

CARVALHAL, in *Geography*, a town of Portugal, in the province of Beira; five leagues S.E. of Porto.

CARVALHO, a town of Portugal, in the province of Beira; four leagues S.E. of Coimbra.

CARVALHO D' ACOSTA, ANTONY, in *Biography*, was born at Liſbon in 1650; and having devoted his life to the ſtudy of the mathematics, aſtronomy, and hydrography, undertook to give a topographical deſcription of his country: with this view he traverſed the whole country, following the courſe of its rivers and croſſing its mountains. The reſult of his inveſtigation is the beſt work on the ſubject, contained in three volumes fol. which appeared between the years 1706 and 1712. It compriſes alſo the hiſtory of the principal places, the illuſtrious men to which they have given birth, their natural curioſities, &c. He alſo wrote an abridgment of geography, and a method of aſtronomy. He died in 1715 in ſuch a ſtate of indigence, that he did not leave enough to pay the charges of his funeral. Nouv. Dict. Hiſt.

CARVANCAS, in *Ancient Geography*, a mountain mentioned by Ptolemy, which terminated Norica, and alſo Pannonia to the weſt.

CARVANIS, a town of Cappadocia, placed by Ptolemy in the Pontus Polemoniacus; probably the *Carbanis* of Steph. Byz. and Cedrenus.

CARUCATARIUS, in *Ancient Law Books*, he that held land in SOCCAGE, or by plough tenure.

CARUCATE. See CARRUCATE.

CARUE, in *Rural Economy*, a term ſignifying the ſouring of any ſort of fluid: thus, to *carue* implies to grow ſour, and is generally applied to cream.

CARVEL, in *Ship-building*. When the edges of the planks are towards each other, the veſſel is ſaid to be *carvel-built*, in contradiſtinction to *clinker* or *clinker-built*, where the edges of the planks over lap each other.

CARVEL of *St. Thomas*, in *Geography*, a rock ſituate between the Virgin iſles E and Porto Rico on the W. At a ſmall diſtance it appears like a ſail, as it is white, and has two points. Between it and St. Thomas, paſſes ſir Francis Drake's channel.

CARVENDONCK, a town of Germany, in the circle of Weſtphalia, and duchy of Cleves; eight miles S.S.E. of Cleves.

CARVENTUS, in *Ancient Geography*, a town of Italy, in Latium. Steph. Byz. Livy, lib. IV. c. 53.

CARVER, a cutter of figures or other devices in wood. See CARVING.

Carvers anſwer to what the Romans called *ſculptores*, who were different from *cælatores*, or engravers, as theſe laſt wrought in metal.

CARVER is alſo an officer of the table, whoſe buſineſs is to cut up the meat, and diſtribute it to the gueſts. The word is formed from the Latin *carptor*, which ſignifies the ſame. The Romans alſo called him *carpus*, ſometimes *ſciſſor*, *ſcindendi magiſter*, and *ſtructor*.

In the great families at Rome, the carver was an office of ſome figure. There were maſters to teach them the art regularly, by means of figures of animals cut in wood. The Greeks alſo had their carvers, called δαιτροι, q. d. *deribitores*, or *diſtributores*. In the primitive times, the maſter of the feaſt carved for all his gueſts. Thus in Homer, when Agamemnon's embaſſadors were entertained at Achilles's table, the hero himſelf carved the meat. Of later times, the ſame office on ſolemn occaſions was executed by ſome of the chief men of Sparta. Some derive the cuſtom of diſtributing to every gueſt his portion, from thoſe early ages when the Greeks firſt left off feeding on acorns, and learned the uſe of corn. The new diet was ſo great a delicacy, that to prevent the gueſts from quarrelling about it, it was found neceſſary to make a fair diſtribution. Athen. Deipn. lib. i. cap. 10. Potter. Arch. lib. iv. cap. 10.

In Scotland the king has an hereditary carver in the family of Anſtruther.

CARVER, in *Geography*, a townſhip of America, in the ſtate of Maſſachuſetts and county of Plymouth. Here is a pond containing ſuch quantities of iron-ore, that 500 tons have been taken out of the clear water in a year. Upon the ſtream which runs from the pond is a furnace; and the iron made of this ore is better than that made of bog ore, and ſome of it is as good as refined iron.

CARVER'S *river*, a branch of St. Peter's river, which diſcharges itſelf into the Miſſiſſippi. See *St.* PIERRE.

CARUGNA, in *Geography*, a town of Piedmont, in the marquiſate of Ivrea; 8 miles S.W. of Jurea.

CARUI, in *Botany*, pratenſe officinarum. Bauh. pin. 158. (Tourneſ. Cl. 7. gen. 4.) See CARUM *Carui*.

CARUI, *foliis tenuiſſimis;* Tourn. See SISON *verticillatum*.

CARUI *alpina*; Bauh. pin. See SESELI *Pyrenæum*.

CARUIFOLIA, Bauh. pin. Villars. See SELINUM *caruifolia*.

CARVILLAN, in *Geography*, a ſmall iſland near the W. coaſt of Scotland, a little to the N. of the iſland of Gigo.

CARVIN-ESPINOY, a town of France, in the department of the ſtraits of Calais, and chief place of a canton, in the diſtrict of Bethune; 4 leagues E. of Bethune. The place contains 4920, and the canton 14,807 inhabitants; the territory includes 90 kiliometers and 11 communes.

CARVING, in a general ſenſe, the art or act of cutting or faſhioning a hard body by means of ſome ſharp inſtrument, eſpecially a chiſſel. In which ſenſe, carving includes ſtatuary and engraving, as well as cutting in wood.

CARVING, in a more particular ſenſe, is the art of engraving or cutting figures in wood. In this ſenſe, carving, according to Pliny, is prior both to ſtatuary and painting. See CUTTING *in wood*.

CARVIST, in *Falconry*. See FALCON.

CARULA, in *Ancient Geography*, a town of Spain, in Bætica, between Baſilippo and Ilipa, according to the Antonine Itinerary, ſuppoſed to be the preſent *Villa-Nuevo-del-Rio*.

CARUM, in *Botany*. (Said to derive its name from Caria, in Aſia Minor, where the original ſpecies grows abundantly.) Linn. gen. 365. Schreb. 497. Willd. 561. Juſſ. 219. Gært. 125. Claſs and order, *pentandria digynia*. Nat. ord. *Umbellatæ*, Linn. *Umbelliferæ*, Juſſ.

Gen. Ch. Cal. *Umbel univerſal*, long; rays ten or more, often unequal; *umbel partial*, crowded; *involucre univerſal*, often monophyllous; perianth ſcarcely manifeſt. *Cor. univerſal*, uniform; florets of the diſk frequently abortive. *Cor. proper* unequal; petals five, unequal, obtuſe, keeled, inflex-emarginate. *Stam.* Filaments five, capillary, length of the corolla, caducous; anthers roundiſh, very ſmall. *Piſt.* germ inferior; ſtyles two, very ſmall; ſtigmas ſimple. *Peric.* none; fruit ovate-oblong, ſtriated, diviſible into two. *Seeds* two, convex on one ſide, flat on the other.

Eſſ. Ch. *Fruit* ovate-oblong, ſtriated, general involucre moſt commonly monophyllous. *Petals* keeled, inflexed, emarginate.

Sp. 1. C. *carui*, caraway. Linn. Sp. Pl. Mart. Willd. 1. Woodville. Med. bot. pl. 45. Eng Bot. 1503. (Seſeli Carum. Scop. Lam. Villars. Apium. Crantz. Liguſticum carui; Roth Germ.) "Stem branched; ſheaths of the leaves diſtended; partial involucre, moſt commonly none. Willd. *Root* ſpindle-ſhaped, biennial. *Stem* about two feet high, angular, furrowed, ſmooth. *Leaves* ſmooth, doubly pinnate; cut into linear narrow ſegments, the lowermoſt of which croſs each other. *Umbels* numerous, terminal, upright. *General involucre* of one, two, or three ſmall, narrow, entire leaves; *partial one* almoſt always none. *Petals* nearly uniform, white or very pale fleſh-coloured, inflexed ſo as to become heart-ſhaped; calyx entire. The central flowers only fertile, according to Dr. Smith; but Linnæus deſcribes the flowers of the diſc as being ſometimes abortive, and Dr. Withering aſſerts that they are all fertile. *Fruit* ſmall, oblong, ſtriated, each ſeed almoſt cylindrical. Dr. Smith. The ſeeds are well known to have a pleaſant ſpicy ſmell, and a warm aromatic taſte; and on that account they are a common ingredient in cakes, and are encruſted in ſugar for comfits; they are alſo diſtilled with ſpiritous liquors to improve their flavour. The tender leaves in the ſpring are boiled in ſoups; and the roots are ſaid by Parkinſon to be better eating than parſnips. The ſeeds are eſteemed to be carminative, cordial and ſtomachic, and recommended in dyſpepſia, flatulencies, and other ſymptoms attending hyſterical and hypochondriacal diſorders; they are alſo reported to be diuretic and to promote the ſecretion of milk.

An eſſential oil and a diſtilled ſpirit are directed to be prepared from them by the London college. They give out the whole of their virtues by moderate digeſtion, to rectified ſpirit. Watery infuſions are ſtronger in ſmell than the vinous tincture, but weaker in taſte. In diſtillation or evaporation, water elevates all their aromatic part; the remaining extract is almoſt inſipid, and thus diſcovers that there is in them leſs of a bitteriſh or ungrateful matter joined to the aromatic than in moſt of the other warm European ſeeds. Along with the aqueous fluid there ariſes in diſtillation an eſſential oil in the proportion of about one ounce from thirty, which is hotter in taſte and more pungent than that obtained from moſt of our other warm ſeeds. Woodville. A native of many countries in the northern part of Europe. In England it is found apparently wild, but, as Dr. Smith thinks, only accidentally naturalized, in Bedfordſhire, Cambridgeſhire, Suffolk, Norfolk, Lincolnſhire and Yorkſhire. On the banks of the Humber, near Hull, it is ſo abundant, that great quantities of the ſeeds are collected every year by the poor people and ſold to the apothecaries and confectioners. It is cultivated in ſeveral counties, particularly in Eſſex; and in others, intermingled with coriander and teaſels. Twelve pounds of caraway, ten of coriander, and twelve of teaſels, are a proper quantity for one acre. They require freſh land which has lain long in paſture, and a ſoil conſiſting of a ſtrong clayey loam. The paſture ſhould be ploughed, ſowed, and harrowed about the beginning of March. In about ten weeks the plants will be ſtrong enough to bear hoeing, which ſhould be repeated three times in the courſe of the ſummer. The coriander being annual will be fit to cut about the beginning of July, and is threſhed in the field on a cloth in the manner of rape ſeed. The ground ſhould be hoed again in the ſucceeding April and June, and needs no other culture; the caraway will be ready in the beginning of July, and the teaſels about the middle of September. Mart. Miller. 2. C. *ſimplex*, Willd. 2. "Stem quite ſimple; ſheaths of the leaves preſſed cloſe to the ſtem; partial involucre of many leaves." *Stem* half a foot high, erect, terminated by a ſolitary umbel. *Leaves* reſembling thoſe of the preceding ſpecies, but ſmaller and narrower; ſheaths ſtriated, not dilated, only ſlightly membranous at their edges. *Umbel* conſiſting of from thirteen to fifteen unequal rays; partial umbels capitate. *Leaflets* of the partial involucre briſtle-ſhaped, unequal, numerous. *Flowers* white, ſmall. A native of Siberia.

Carum *foliolis ſetaceis verticillatis*; Sauv. mons. See Siſon *verticillatum*.

Carum *bunias*, Syſt. nat. 12. Jacq. tab. 198. Gouan. illuſ. 20. See Æthusa *Bunias*.

CARUNCULA, Caruncle, a term in *Anatomy*, properly ſignifying a little piece of fleſh, being a diminutive of the Latin *caro*, fleſh.

The name *caruncula* is applied to ſeveral parts of the body.

Caruncula, or Caruncle, in *Surgery*, a kind of warty excreſcence, or fleſhy ſubſtance; which the older ſurgeons ſuppoſed to be a very frequent cauſe of obſtruction in the urinary canal, and particularly in thoſe caſes uſually denominated *Strictures* of the urethra. See Bougies and Stricture. Mr. Hunter, and ſeveral other practitioners, have of late aſcertained, by actual diſſections after death, that patients who have ſuch ſtrictures are very rarely affected with caruncles; and, indeed, that they are ſcarcely ever found, except a ſhort way within the urethra.

Caruncula *lacrymalis*, in *Anatomy*, a ſmall prominence in the inner angle of the eye, between the two eyelids. See Eye.

Carunculæ *myrtiformes*, ſome ſmall fleſhy excreſcences, varying in ſize and number, which are found at the orifice of the vagina, after the rupture of the hymen. See Generation, *organs of*.

CARVO, or Carvonis, in *Ancient Geography*, a place of Belgic Gaul, between Mannaricium and Harenatium, according to the Itinerary of Antonine; placed by M. d'Anville on the left of the Rhine, N.E. of Noviomagus.

CARURA, a town of India, placed by Ptolemy on this ſide of the Ganges.

Carura, a village of Aſia Minor, near the Meander, where they had lodging-houſes for the accommodation of ſtrangers, and a number of hot ſprings. It ſerved as a boundary between Phrygia and Caria. Strabo.

Carura, *Kauri*, a royal town of India, in the interior of the country called Limyrica, according to Ptolemy; ſituated about 15 leagues from the ſea, S.S.E. of Tyndis and N.E. of Muziris.

Carura, or Ortospana, a place of Arachoſia, at the foot of mount Paropamiſus; from which place Alexander ſet out on his entrance into India. It was ſituated below the ſource of a ſmall river, which flowed into the lake Arachotus.

CARUS, in *Biography*, a Roman emperor, was born at Narbonne in Illyricum, confounded by Eutropius with the more famous city of that name in Gaul, his father probably being an African, and his mother a noble Roman; and thus the different opinions with reſpect to his origin have been conciliated. He was educated in the capital, and gloried in the title of Roman citizen. His merit advanced him through a gradation of civil and military honours to the rank of pretorian prefect under the emperor Probus, by whom he was ſo much eſteemed that he wrote to the ſenate to order an equeſtrian ſtatue to be erected to him, and a houſe to be built for him at the expence of the ſtate. Upon the murder of that prince by his mutinous ſoldiers, A. D. 282, Carus, being about 60 years of age, was unanimouſly elected by the ſoldiers, or publicly acknowledged, if, as ſome have ſuppoſed, he was named emperor before the death of Probus. Having notified his election to the ſenate, without ſoliciting their confirmation of it, he began his reign by puniſhing the aſſaſſins of his predeceſſor, though he could not eſcape the ſuſpicion of being acceſſory to a deed from which he derived the principal advantage. The next meaſure of his government was the inveſtiture of his two ſons with a ſhare of the imperial power, with the title of Cæſar. See Carinus. He then proceeded againſt the Sarmatians, who had made an incurſion into Illyricum, and defeated them with a great ſlaughter; 16,000 of them remaining dead on the field of battle, and 20,000 being taken captives. In the beginning of the year 283 he purſued his march, accompanied by his ſon Numerian, in the midſt of winter, through the countries of Thrace and Aſia Minor to the confines of the Perſian monarchy. Here, without aſſuming any enſigns of imperial dignity, except a coarſe woollen garment of purple, but ſeating himſelf on the graſs, with a piece of ſtale bacon and a few hard peas for his ſupper, he gave audience to the Perſian ambaſſadors. In the interview he took off a cap which covered his baldneſs, and aſſured the ambaſſadors, that unleſs their maſter acknowledged the ſuperiority of Rome, he would ſpeedily render Perſia as naked of trees as his own head was deſtitute of hair. Theſe declarations were not impotent menaces; for he ravaged Meſopotamia, made himſelf maſter of the great cities of Seleucia and Cteſiphon, and carried his victorious arms beyond the Tigris. His career, however, was ſuddenly interrupted by a premature death, attended with circumſtances which rendered it extraordinary. When he was confined by ſickneſs to his bed, a furious tempeſt aroſe in the camp, accompanied with ſingular darkneſs, and inceſſant flaſhes of lightning, and a loud clap of thunder was ſucceeded by a ſudden cry that the emperor was dead. It ſoon appeared that his chamberlains, in the paroxyſm of their grief, had ſet fire to the royal pavilion, and hence a report originated that Carus was killed by lightning; when in truth he died of the diſorder with which he had been ſeized. Such is the account given by his own ſecretary to the prefect of the city. Arrius Aper, the pretorian prefect, is accuſed by Vopiſcus with having occaſioned this cataſtrophe, and as he afterwards contrived the murder of Numerian, and the emperor's tent was ſet on fire, the ſuſpicion againſt him is confirmed. The death of Carus happened in the cloſe of the year 283 after a reign of 16 or 17 months. His temper was haughty, and his manners harſh and intractable; however he was flattered by an eclogue on his acceſſion to the throne, and after his death ranked among the gods. Carus and his two ſons bore the names of Marcus Aurelius. Crevier's Hiſt. of the Emperors, vol. ix. Gibbon's Hiſt. vol. ii.

CARUS, in *Medicine*, a diſeaſe which, according to the definitions of Sauvages, and ſome other noſologiſts, differs from apoplexy only in the abſence of the ſtertorous noiſe in breathing, and in the ſopor (or morbid ſleep) being ſomewhat leſs profound. It is properly conſidered by Dr. Cullen as a minor degree of apoplexy. (Synopſ. Noſol. Meth. p. 184.) See APOPLEXY.

CARUSA, in *Ancient Geography*, a town of Aſia Minor, in Paphlagonia, ſeated on the Euxine ſea. Scylax calls it *Caruſſa*, and ſays that it was a Greek city, between the river Halys and the town of Sinope. Ptolemy calls it *Cariſſa*.

CARWAITEN, or GRAWATTEN, in *Geography*, a town or rather village of Pruſſia, in the country of Samland, belonging to the government of Memel, the inhabitants of which ſubſiſt by fiſhing; 44 miles N. of Konigſberg.

CARWAR, a maritime town of Hindooſtan, ſituate on the coaſt of Malabar, between Meerzaw, or Merſhee, and cape Ramas in the neighbourhood of Goa, where the Eaſt India company have a factory; but better known to the Engliſh in the early period of their India trade, and before they were in poſſeſſion of Bombay. The valleys about it ſupply plenty of corn and pepper of an excellent kind. The woods on the mountains abound with quadrupeds, ſuch as wolves, monkeys, wild hogs, deer, elks, and beeves of a prodigious ſize. It is diſtant about 40 miles S.E. from Goa. N. lat. 15° E. long. 74° 10′.

CARY, LUCIUS, in *Biography*, viſcount Falkland, was the ſon of Henry viſcount Falkland, and lord deputy of Ireland in the reign of king James I.; and born, probably at Burford in Oxfordſhire, about the year 1610. Being removed at an early period to Ireland, he received part of his education at Trinity college in Dublin, and completed it at St. John's college in Cambridge. In his youth he was chargeable with ſome irregularities; but before he had attained the age of 20 years, he came into poſſeſſion of a large and independent fortune, that had deſcended to him in conſequence of the gift of a grandfather, and he terminated his career of diſſipation by marrying a young lady of diſtinguiſhed accompliſhments but ſmall fortune, whom he paſſionately loved. In forming this connexion he gave great offence to his father, who had entertained hopes of amending his own circumſtances by his ſon's marriage; and though he made ample conceſſions, and even offered to ſurrender his whole eſtate to the diſpoſal of his father, and to depend wholly on his kindneſs for a ſubſiſtence, his father remained unrelenting and irreconcileable. Diſtreſſed by this circumſtance, he determined to leave England; and accordingly he removed, with his wife, to Holland, where it was his intention to purchaſe ſome military command; but failing to accompliſh this object, he returned to his own country, where he lived in retirement and proſecuted his ſtudies, with uncommon aſſiduity and ardour, maintaining at the ſame time an intercourſe with ſome of the beſt ſcholars of that age. In a very ſhort time he is ſaid to have made himſelf perfect maſter of the Greek tongue, and to have read with an accurate attention all the Greek hiſtorians. Before he was 23 years of age, he had peruſed all the Greek and Latin fathers; he alſo made himſelf acquainted with all books, which he procured at a great expence from different countries; he likewiſe diligently ſtudied eccleſiaſtical and theological controverſies; and his memory is ſaid to have been ſo retentive, that he remembered, on all occaſions, whatſoever he read. In ſome of his poetical attempts he was ſo ſucceſsful as to have gained the eſteem and admiration of the moſt eminent poets of his time. About the time of his father's death, in 1633, he was made one of the gentlemen of his majeſty's privy chamber; but he ſtill indulged his paſſion for a rural and ſtudious life, and frequently retired to his ſeat near Burford, which by the viſits of literary men from the neighbouring univerſity was a kind of academy. Here Chillingworth wrote his admirable work againſt popery, deriving aſſiſtance in the compoſition of it from the ſuggeſtions of his lordſhip. In this retreat various queſtions of literature, morals, and theology were freely diſcuſſed; and here lord Falkland himſelf, whilſt he was entitled to pre-eminence on account of his extenſive literature, blended with it that modeſty and candour, and ſweetneſs of temper, which commanded the admiration and eſteem of his learned viſitants, no leſs than his diſtinguiſhed abilities and attainments. His habits, however, were not formed in this literary retreat for thoſe public ſcenes in which he afterwards engaged. In 1639 lord Falkland joined the expedition againſt the Scots; and in 1640 he was choſen member of the Houſe of Commons for Newport in the Iſle of Wight; his peerage, being Scotch, not entitling him to a ſeat in the Houſe of Lords. By his attendance on the debates of the houſe, he acquired a high degree of veneration for the authority of parliament; and he was ſo rigid an obſerver of eſtabliſhed laws and rules, that he thought no miſchief ſo intolerable, as the preſumption of miniſters of ſtate in breaking poſitive rules for reaſons of ſtate, or of judges in tranſgreſſing known laws, upon the plea of convenience or neceſſity. Accordingly he was more ſevere than his natural gentleneſs of temper allowed in other caſes, againſt lord Finch and the earl of Strafford; and he had conceived ſuch a diſlike to archbiſhop Laud, and ſome other biſhops, that he concurred in the firſt bill for depriving them of the right of voting in the Houſe of Lords. Hence ſome perſons were led erroneouſly to conclude that he was no friend to the eſtabliſhed government of the church; whereas on ſubſequent occaſions, when he began to ſuſpect the deſigns of the parliamentary leaders, he oppoſed the ſame meaſure to the utmoſt of his power. For ſome time he continued averſe from the court, and manifeſted even a moroſeneſs to courtiers; but at length he was prevailed upon to accept a ſeat in the privy-council, and the office of ſecretary of ſtate. But he was unfit for ſtations of this kind, as he was totally unacquainted with the forms of buſineſs, and as he was actuated by ſcruples which impeded the proſecution of it. He would not agree either to the employment of ſpies, or to the opening of ſuſpected letters. When the breach between the king and parliament came to a criſis, lord Falkland took a decided, firm, and active part with his maſter; and attended him, with conſiderable danger to himſelf, at Edge-hill fight, at Oxford, and at the ſiege of Glouceſter. During his reſidence at Oxford, a circumſtance occurred which we ſhall here recite. When his majeſty viſited the library, he was ſhewn, among other books, a Virgil elegantly printed and bound; and lord Falkland, deſirous of amuſing him, beſought him to try his fortune by that mode of divination which was called *Sortes Virgilianæ.* When the king opened the book, the paſſage which preſented itſelf was part of Dido's imprecation againſt Æneas (l. iv. v. 615, &c.), thus tranſlated by Dryden:

> " Oppreſs'd with numbers in th' unequal field,
> His men diſcourag'd, and himſelf expell'd,
> Let him for ſuccour ſue from place to place,
> Torn from his ſubjects, and his ſon's embrace, &c."

The king's mind ſeemed to be impreſſed by this accident; and, therefore, lord Falkland, hoping for a more favourable occurrence, determined to try his own fortune in the ſame way; but the paſſage which chance preſented him was more ſuited to his own deſtiny than the other had been to the king's. It was the following exclamation of Evander upon the untimely death of his ſon Pallas (Æneid, lib. xi. v. 152, &c.), thus rendered by Dryden:

> " O Pallas! thou haſt fail'd thy plighted word,
> To fight with caution, not to tempt the ſword:
> I warn'd thee, but in vain; for well I knew,
> What perils youthful ardour would purſue;
> That boiling blood would carry thee too far,
> Young as thou wert in dangers, raw to war!
> O curſt eſſay of arms, diſaſtrous doom,
> Prelude of bloody fields, and fights to come."

When lord Falkland perceived the calamities that were impending over his country, his ſpirits ſunk; he loſt the gaiety and ſociableneſs of his temper, became negligent of his dreſs and appearance, reſerved and moroſe, and indicated a mind diſſatiſfied with itſelf and the world. While ſitting among his friends he would frequently, after long ſilence and deep ſighs, with a ſhrill voice repeat the words "peace," "peace," and declare himſelf incapable of living in ſuch a ſtate of perpetual grief and anxiety. The cloſing ſcene proves almoſt a determination to throw away that life which was become a burden. Although poſſeſſing no military command, he reſolved to be preſent at the firſt battle of Newbury, fought September 20th, 1643; and in the morning called for clean linen, that if he were ſlain his body might appear with decorum. Having put himſelf in the firſt rank of lord Byron's regiment, he received a muſket ſhot in his belly, and fell from his horſe. His body was not found till the next day. Such was the fate of lord Falkland, in the 34th year of his age; generally eſteemed as the moſt virtuous public character, in a period fertile of virtue. His praiſes have been reſounded by poets, hiſtorians, and moraliſts, and are, as it were, interwoven with Engliſh literature. His fame perhaps owes moſt to his intimate friend lord Clarendon, who has drawn an elaborate character of him, and in ſome reſpects makes him the moral hero of his hiſtory. Lord Falkland left behind him ſome poems, and various ſpeeches and pamphlets on political and theological topics. Biog. Brit. Gen. Biog.

Cary, Robert, a learned chronologer, was born at Cochinton, in Devonſhire, about the year 1615. He finiſhed his education at Oxford, whither he went in 1631, and where he took his degrees, and was created doctor of laws in 1644. He travelled into foreign parts, and on his return was preſented with the rectory of Portlemouth, near Kingſbridge, in Devonſhire. During the troubles he joined the Preſbyterian party, but upon the reſtoration of Charles II. he was one of the firſt who congratulated him on his return, and was ſoon after preferred to the arch deaconry of Exeter. But after about two years he was ejected, in 1664, and retired to his rectory, where he paſſed the remainder of his life with reputation, and died in September 1688. He publiſhed his "Palæologia Chronica, or a chronological Account of ancient Times, in three parts, 1. Didactical, 2. Apodeictical, 3. Canonical," Lond. 1677, fol. Of this book we have an account in the Philoſophical Tranſactions, N° cxxxii. p. 808. He was, in his younger years, ſkilled in poetry, both Latin and Engliſh; but his only publication of this kind was thoſe hymns of our church which are appointed to be read after the leſſons, together with the creed, &c. They were tranſlated by him into Latin verſe. Biog. Brit.

Cary, in *Geography*, the name of a ſmall river in the county of Antrim, Ireland, which uniting with ſome other mountain ſtreams falls into the North Channel, at Ballycaſtle.

Cary, the northern barony of the county of Antrim, Ireland, oppoſite to the Iſland of Rachlin, and remarkable for the Baſaltic region, of which the Giant's Cauſeway is a part. It was anciently called the *Route*, or *Root*, and was taken poſſeſſion of by the clan of M'Donalds from the Hebrides, ſome time previous to what has been called the *plantation of Ulſter*, in the reign of James I. The barony received its preſent name from a caſtle now in ruins. Some old maps have alſo a cape marked Cas-Cary, which muſt be what is now called Tor-point. Hamilton's Antrim.

Cary *Bay*, a large bay on the ſouth coaſt of Cornwall, round the point of the Deadman to the weſtward, and extending almoſt to the eaſtern point of the entrance into Falmouth haven.

CARYA, in *Ancient Geography*, a country of the Peloponneſus, in Laconia, the capital of which was of the ſame name. Vitruvius mentions the deſtruction of this city, becauſe it united with the Perſians, who were enemies to the Greeks. The male inhabitants were put to the ſword, and its females were made captives. Pauſanias ſays, (Lacon. l. iii. c. 10. p. 230.) that it had a temple of Diana Caryatis, and a ſtatue of that goddeſs in the open air. It was ſituated on the banks of the river Œnus, a little to the weſt of Glympes. See Caryates and Caryatides.

Carya. See Caria.

CARYANDA, an iſland of Aſia Minor, in the Mediterranean, on the coaſt of Caria. Pliny.—Alſo, a town of Aſia Minor, in Caria. Steph. Byz. ſays, that it was a ſeaport, near Mindus and Cos. Scylax, who was of this city, ſays, that Caryanda was an iſland, town, and port. It has ſince been called *Caracoion*.

CARYATES, in *Antiquity*, a feſtival in honour of Diana, ſurnamed Caryatis, held at Caryum, or Carya, a city of Laconia. The chief ceremony was a certain dance, ſaid to have been invented by Caſtor and Pollux, and performed by the virgins of the place.

During Xerxes's invaſion, the Laconians not daring to appear and celebrate the cuſtomary ſolemnity, to prevent incurring the anger of the goddeſs by ſuch an intermiſſion, the neighbouring ſwains are ſaid to have aſſembled and ſung paſtorals, or *bucoliſmi*, which are ſaid to have been the origin of bucolic poetry.

CARYATIDES, in *Architecture*. Beſides columns and pillars, ſtatues of various kinds have been employed by architects for the ſame purpoſes. Female figures of this nature clothed in long garments were called by the Greeks Caryatides, the reaſon of which is thus explained by Vitruvius, lib. i. The inhabitants of Carya, a city of the Peloponneſus, having joined with the Perſians againſt the Grecian ſtates, and the Greeks having terminated the war by a glorious victory, with one conſent commenced hoſtilities againſt the Caryates. They took the city, deſtroyed it, put all the males to the ſword, and carried the females into captivity; and to treat them with ſtill greater ignominy, forbad them to diveſt themſelves of their robes, or any of their ornaments, that ſo they might not only be once led in triumph, but in a manner ſuffer the ſame mortification all their lives by conſtantly appearing in the ſame dreſs as on the triumphal day. And further, as an everlaſting teſtimony of the crime of the Caryates, the architects of that time employed the repreſentations of theſe women to ſupport the entablatures of their public buildings.

Vitruvius proceeds to inform us, that the Lacædemonians, after the battle of Platea, erected with the ſpoils and plunder the Perſian portico, as a trophy, to tranſmit to poſterity the valour and honour of the citizens; introducing therein the ſtatues of the captives, adorned with habits in the barbarian manner, ſupporting the roof. Thus, with merited infamy they puniſhed pride, terrified their enemies with the idea of their power, and the citizens beholding this monument of their courage, were inſpired with a love of glory, and became more animated in the defence of their liberty. Hence it is, that many introduce Perſian ſtatues ſuſtaining the entablature, and thus make an excellent variety in their works.

The Greeks and Romans had alſo two other denominations for theſe figures, derived from their action of carrying or ſupporting, *Atlantes* and *Telamones*. Caryatides, however, has become by modern uſage a generic term for theſe ſtatue-columns, and we ſhall accordingly under this article take a general view of the ſubject.

From the hiſtory related by Vitruvius we might be led to ſuppoſe that the Greeks were the inventors of this order, if it may be ſo called: they were not, however, the firſt, though it is not improbable that in different countries, without communication with each other, the love of allegory, religious or political motives, or the mere caprice of ornament, may have transformed columns into ſtatues.

That the Egyptians had adopted this manner appears from ſome remains, from the teſtimony of authors, and from the nature of their ſculpture. Among the ruins of the Memnonium, at Thebes, there is a portico with figures engaged in the pilaſters ſupporting the entablature: theſe ſtatues have the lituus in one hand and the flagellum or ſcourge in the other, as commonly ſeen in the ſtatues of Oſiris. Among the figures given by Denon there is a curious kind of frieze compoſed of truncated human figures, which, with their heads and one elbow lifted up, ſupport the cornice. Diodorus Siculus in deſcribing the ſepulchre of Oſymanduas, gives an account of a periſtyle four hundred feet ſquare, which inſtead of pillars was adorned with animals, each of a ſingle ſtone, and four and twenty feet high, executed after the ancient manner, and it was covered with ſtones twelve feet long, the ceiling being painted azure, and ornamented with ſtars. We are not informed what kind of animals theſe were, or what was their attitude; perhaps they were ſphinxes, which inſtead of being in the uſual crouched poſture of thoſe commonly ſeen, which were placed at the entrance of the temples, were in a ſitting attitude in the manner of the Athenian lions preſerved at Venice. At leaſt this ſeems the only poſition in which ſimilar ſupports could be placed to have the required height and neceſſary ſolidity. The ſame hiſtorian relates that Pſammeticus erected a periſtyle at Memphis, to which coloſſal ſtatues of eighteen feet high ſerved for pillars.

Sculpture appears to have been in Egypt entirely ſubordinate and ſubſervient to architecture, an art which had no motive but religion, no object but the decoration of its edifices; whether it led up to the temple gate the long avenue of ſphinxes, emblems of the myſtery which overſhadowed its walls or ſeated in ſublime tranquillity, the coloſſal effigies of its gods; or inſcribed in countleſs hieroglyphics its ſecret doctrines and excluſive knowledge.

When we conſider the nature of the Egyptian ſtatues and the timidity of the artiſts who never ſeparated the legs, and generally attached the figure behind to a ſquare ſlab or pilaſter reſerved out of the block, we ſhall not be ſurpriſed that independently of any religious motives which might lead to the uſe of Caryatides, the idea ſhould originate of employing for the ſupport of buildings ſtatues which did not yield in real ſolidity and apparent ſtrength to any ſpecies of columns. If alſo we conſider the ſtyle of ſculpture, its rigid ſymmetry of attitude and motionleſs inflexibility of appearance, we muſt allow that no ſtatues were better adapted to take the place of columns, and no where were the objections which may be urged againſt the uſe of Caryatides leſs founded. Accordingly, it ſeems probable that no where was this cuſtom more prevalent than in Egypt.

We may perhaps form the beſt idea of the Egyptian Caryatides from thoſe which at preſent ſupport the entablature of the great door of the Muſeum Vaticanum. Theſe ſtatues were found in the villa of Adrian, and were probably among thoſe which that emperor, ſo deſirous of imitating Egyptian cuſtoms, cauſed to be made in the manner of thoſe which exiſted in Egypt. They are eleven feet in height, including the plinth. The capitals which riſe above their heads are of the bell ſhape ſo commonly obſerved in the Egyptian remains. The appearance of theſe Caryatides is ſingularly grand, in ſpite of all the incongruities of their ſituation and of the details of the architecture which accompanies them.

The Hindoo excavations in the mountains of Ellora near Aurungabad in the Decan; works of whoſe origin hiſtory has preſerved no memorial, but whoſe ſtupendous execution ranks them among the wonders of human labour, may be cited among the inſtances of the uſe of Caryatides. In one of theſe the Kailaſa, or paradiſe of the gods, a monument which preſents the appearance of a vaſt and elaborate building, ſtanding in a conſiderable area, the whole of which is excavated in the granite rock; the baſement of this aſtoniſhing edifice is ſculptured with the figures of elephants and lions, giving the whole mighty maſs the appearance of mobility by theſe powerful animals. The excavated rocks of Mauveliporam offer ſingular pillars, each being compoſed of the figure of a lion ſitting on a double plinth, forming the lower part of the ſhaft, which riſing octagonally and tapering, terminates in a capital conſiſting of three horſemen, which ſupport the entablature. In one of the excavated temples on the iſland of Salſette, there are capitals well executed, and compoſed chiefly of elephants, to which, in ſome inſtances, are added horſes and human figures. In Jaganatha Sabha, another of the excavations of Ellora, the pillars reſt upon elephants. Daniell's Antiquities of India and Hindoo excavations.

The deſcription of the temple of Jeruſalem preſerves ſome traces of this cuſtom. Hiram's molten ſea was ſupported by twelve bulls, and on the walls of the oracle he placed alternate cherubim and palm trees, ſupporting wreaths of flowers, and probably the ceiling.

In the ruins of Perſepolis alſo, there remain ſome capitals conſiſting of horſes and camels. And in geographical, though not in chronological order, we may mention ſome inſtances at Palmyra. The coloſſal cornice of the great temple has modillions in the form of bulls and lions, ſupporting the corona, and in more than one example ſtatues of genii are uſed to ſuſtain a kind of projecting balcony in the ſingular tower-ſhaped mauſoleums which are found there.

Though however the idea of employing Caryatic figures is not original to Greece, the moſt complete and intereſting example of this practice is among the remains of ancient art at Athens. "To the north of the Parthenon, at the diſtance of about one hundred and fifty feet, are the remains of three contiguous temples. That towards the eaſt was called the Erectheum; to the weſtward of this, but under the ſame roof, was the temple of Minerva, with the title polias, as protectreſs of the city; adjoining to this, but under the ſame roof, is the Pandroſium, ſo named becauſe it was dedicated to the nymph Pandroſus, one of the daughters of Cecrops." This is an open portico, compoſed of ſix Caryatides, four being placed in front and two in the ſides; five of the ſtatues remain to the preſent time. Within the Pandroſium was the olive tree, ſaid to have been produced by Minerva in her conteſt with Neptune for the patronage of the city; it was called pankyphos, incurvated, from its branches having bent downwards after it had grown up to the roof; and under the tree ſtood the altar of Jupiter Herceus. (Stuart's Athens.) Theſe Caryatides agree perfectly with the deſcription of Vitruvius: they are deſigned in a grand and broad ſtyle, their drapery is ample and flowing, their hair arranged with art. The height of the figures is ſeven feet nine inches, including the capital and plinth: their attitudes are ſimple and ſymmetrical; their air ſerene and tranquil. The ſtatues are placed upon a continued pedeſtal, but with ſeparate plinths to each. Above the head riſes a capital, ſomewhat reſembling that of the Doric order, and upon the capitals is placed an entablature, very nearly three feet high, but conſiſting only of architrave and cornice, the frieze being ſuppreſſed. The cornice is dentilated and the mouldings enriched; the upper facia of the architrave is ſingularly ornamented with little rounds diſpoſed at equal diſtances. It is not eaſy to account for the ſingularities of the entablature and its extraordinary height compared to the figures; probably a Caryatic portico was not conſidered as ſubject to any of the common rules of architecture. The reader will find an elevation of this monument in *Plate* XIX. of *Architecture.*

The Caryatides of the Villa Albani are another beautiful example; they are female ſtatues clothed in long garments, the arms and necks ornamented with bracelets and necklaces, the head-dreſſes carefully arranged. A Greek inſcription on one of them informs us, that they were the work of two Athenian ſculptors, Crito and Nicolaus. Winckelmann is of opinion that theſe artiſts arrived at Rome about the time of Julius Cæſar; but whether theſe figures were executed at Rome, or tranſported there by ſome Roman plunderer, cannot be known. It ſeems probable, from a certain want of ſymmetry in their attitude and ornaments, that they are only part of a larger number and were not intended to be arranged contiguouſly. One of them has the head enveloped in a veil, which aſcends to the top of the capital. The capital of another is plain and without ornament, the others are decorated with as much elegance as richneſs.

Among the antiquities of Rome there are various fragments of ſtatues, which, from their attitudes and the capitals on their heads, may be ſuppoſed to have ſerved as ſupports to the entablatures of buildings. It appears, that the inſide of the Pantheon was ornamented in this manner by Diogenes the Athenian; they were probably executed in baſſo-relievo, and employed in the Attic over the columns.

In the tomb of the freed-man of Sextus Pompeius, on the Appian way, there is an example of Caryatides of both ſexes. They are in baſſo-relievo, and decorate rather than ſupport the different ſtories of the columbarium. The firſt order conſiſts of female figures draped, who, with extended arms, ſupport a great veil which entirely ſurrounds them. They have no capitals; but their feet are mounted on ſmall plinths. The Caryatides in the upper ſtory are of a particular kind, and of an invention ſufficiently capricious. They are naked figures, whoſe heads, ſurmounted with capitals, ſupport the cornice, and in their hands each holds a column perpendicularly, which ſupports nothing. This fancy ſeems to have given riſe to one ſtill more whimſical, which has been executed by Daniel de Volterra, in his chapel of La Trinita del Monte, where there are figures ſupporting in one hand a capital, and in the other the column adapted to it.

Theſe freaks of imagination, it is hardly neceſſary to obſerve, are only tolerable in the arabeſque, where may be found an ample collection of figures, which the caprice of decoration has adapted to the office of Caryatides.

It would be generalizing too far to include, among the ſubjects of this article, the compoſitions of winged genii, terms, griffins, and ſo many other fantaſtic animals which adorn and ſupport altars, tripods, vaſes, and other antique utenſils. Theſe objects, though confined by the realities of execution and the convenience of uſe to more connection and probability than the dreams of arabeſque, are not amenable to the grave laws of architecture. It is on account of not having perceived the limits of imagination in theſe different walks of arts that the Caryatides, which were originally a licence in architecture, have become, under the chiſel of the moderns, abuſes intolerable and unworthy of indulgence from the leaſt ſcrupulous reaſon.

This cenſure is not, however, applicable to the earlieſt revivers of this ſtyle of decoration; and we muſt do the juſtice to that diſtinguiſhed artiſt Jean Goujon, to allow, that in the beautiful Caryatides which ſupport the tribune of the former ſalle des gardes of the Louvre, he has conceived an idea juſt, grand, and ſuperior to every other modern inſtance. This monument conſiſts of four female figures, twelve feet in height, elegantly draped, with capitals on their heads, and ſtanding on circular pedeſtals; which ſupport an entablature of the Ionic order, richly ornamented, one quarter of the height of the ſtatues and pedeſtal. What is remarkable, the artiſt has repreſented the arms of the figures as truncated a little below the ſhoulder. It is certain, that this inſtance bears conſiderable reſemblance to the Caryatic portico at Athens, by the general idea of a gallery projecting from a larger maſs of building, by the number of figures being in both caſes four in front, their ſymmetrical arrangement, and particularly by the arms, which may be thought to be truncated in imitation of thoſe which time has mutilated. We cannot ſay, however, whether or not Jean Goujon had any knowledge of the Athenian Caryatides; if not, the merit of the invention and compoſition does the greateſt honour to his genius; and even if he were acquainted with them, ſuch an imitation ſhews conſummate taſte and judgmate; while the details remain intirely his own.

It is difficult to find a ſubject of approbation in any other modern inſtance of Caryatic figures. Thoſe of the celebrated Loggia de Lanzi, by Orcagna at Florence, and a multitude of other Atlantes in that town and elſewhere, which are ſeen bending under the weight of an architecture which cruſhes them, are but capricious inventions, where the ſculptors have rather conſidered their art than its harmony with the architecture.

Every one who is acquainted with the hiſtory of the fine arts after their revival in Italy, knows how much the ſtyle of ſculpture and architecture was influenced by that of painting. Painting was the favourite art, that which produced moſt genius, and was often exerciſed in common with the other arts by the ſame perſon. But it would not be difficult to ſhow, were this the proper place, that the principles of painting are very frequently in contradiction to thoſe of ſculpture, and ſtill more of architecture. Hence, aroſe a moſt abundant crop of abuſes, from which the immediate proximity of antique examples could not preſerve the building art, when the painters of decorations became its arbiters, and fictitious architecture its model. Among theſe muſt be reckoned the Caryatic figures, which became the common ornaments of ceilings and vaults under the Carraci, Domenichino, Lanfranco, and many inferior artiſts and imitators. The compoſition of theſe had no other rule than the caprice of the painter, who regarded them as a kind of academy figure, ſuſceptible of all the extravagancies of attitude and all the oſtentation of anatomy.

We now come to the theoretical and critical portion of this article; and, in the firſt place, it merits conſideration, whether the employment of Caryatides is not radically faulty as violating nature and the eſſential principles of imitation. It may be urged as an obvious impropriety to make the figures of men and women ſupport the enormous load of the entablatures and coverings of buildings. The ſight and imagination ſeem to be equally offended by the neceſſity of admitting the repreſentation of circumſtances of which the reality cannot for an inſtant be ſuppoſed poſſible.

If the example and authority of perhaps all nations who have been diſtinguiſhed in architecture were conſidered ſufficient, theſe objections would be anſwered by the preceding article: but as this cuſtom might have no other than religious and political motives, it is not impoſſible that taſte and rational criticiſm might be at variance with ſuch inſtitutions, and agree to baniſh from modern works a practice which, having no longer any connection with theſe motives, or any other object than the gratification of the ſight, offends gratuitouſly the principles or the appearance of ſolidity. We do not doubt, however, that Caryatides may be defended on the following conſiderations.

Sculpture, though it realizes in its imitations the external forms of objects, departs ſo widely from them in colour and texture, that no art is leſs capable of producing illuſion: the ſight is more affected by colour than figure. Zeuxis might deceive the birds with his bunch of grapes, and his competitor him with the curtain; but certainly a ſtatue was never taken for a man. Accordingly, every production of ſculpture may be conſidered both with regard to the object imitated, and the matter of which that imitation is compoſed. With regard to the firſt, nothing undoubtedly is more abſurd than to cauſe a man to perform the impoſſible function of a column; but with regard to the ſecond, nothing is leſs unreaſonable and more poſſible than to give that office to a ſtatue, whoſe ſolidity is equal, and material the ſame. Why not ſupport a ſtone entablature with a ſtatue equally of ſtone. When therefore figures are employed as Caryatides, it muſt be underſtood, that theſe figures are not the living and animated expreſſion, but the material and motionleſs image of the object repreſented. On this occaſion a kind of counter-illuſion is required of the ſpectator; and it is neceſſary that, overlooking every thing of deception, which might lead him to forget the material, he ſhould ſtop at the firſt impreſſion of the ſenſes, and inſtead of yielding fleſh, ſee only inflexible marble and bronze. This is not a difficult effort but the natural impreſſion, when the ſculpture in harmony with the architecture does not pretend to too much motion, action, and life. Nobody, in ſeeing the Egyptian ſtatues, can ſay, that nature and probability could be violated by ſuch allegorical ſupports.

On the other hand, when the deſcriber of Kailaſa obſerves, that the baſement, ſculptured with elephants and lions, gives the whole maſs the appearance of mobility on theſe mighty animals; he reports a ſevere cenſure, for this is exactly the air that a great edifice ought not to have.

From what has been advanced, it cannot be denied as a general propoſition, that Caryatides are admiſſible in the moſt regular and conſiſtent architecture. Reaſon demands real, and taſte apparent, ſolidity in ſupports; now the firſt exiſts inconteſtibly in the material of which theſe figures are formed, and the ſecond may be preſerved with attention to the rules of propriety, indicated by the nature of the objects, and which we ſhall proceed to diſcuſs.

Conſidering the preceding obſervations, good taſte will include in a general cenſure, all the figures ſo commonly ſeen bending under the maſſes which overwhelm them, thoſe ſymbols of ſlavery whoſe laborious attitudes affect the ſpectator with ideas of oppreſſion and miſery. The more the ſculptor diſplays of anatomy, the more forcibly he expreſſes the contraction of the muſcles; in ſhort, the more he gives of truth, in the action and movement, the more he will incur of blame from ſound criticiſm. His figures appear weaker as they make the more effort; and though good ſtatues, they will be bad Caryatides.

Let the figures intended for this purpoſe, broad and grand in their proportions, approaching the coloſſal in dimenſions, ſimple and upright in attitude, ſevere in expreſſion, preſent to the ſpectator an immoveable tranquillity in their appearance. Let ſymmetry prevail in their poſition and acceſſaries. Let the apparent weakneſs of the neck be corrected by treſſes of hair deſcending on their ſhoulders, and the drapery, agreeably defining the forms of the limbs, but tending to perpendicular folds, ſtrengthen the figure below, and give ſolidity to the whole. Thus we have almoſt deſcribed the Caryatides of Athens, or of Jean Goujon. This artiſt, a ſculptor and architect, had ſo well conceived the rules of taſte proper to the ſpecies of ſculpture in queſtion, that to take away all pretence of illuſion, he has repreſented the figures, as has been already mentioned, without arms, and under the appearance of mutilated effigies. However, without carrying our ſcruples ſo far on this point as Jean Goujon, it will be ſufficient to imitate him in the general character of gravity and auſterity which he has imprinted on this performance.

It ſeems neceſſary to give capitals to Caryatic figures to prevent the diſagreeable ſenſation produced by the architrave reſting immediately on the head, and to avoid the abrupt contact of the forms of ſculpture and architecture by an intermediate object partaking of both. The capitals in antique examples ſometimes approach the Doric form, as in the Athenian Caryatides, and ſometimes the Corinthian bell-ſhape, as in thoſe of the Villa Albani. The firſt is rich and well adapted to the ſhape of the head, the other has more lightneſs and elegance. It is proper in theſe things to keep a medium between the rigour of architecture and the caprices of mere ornament. Some antique capitals have been found imitating a baſket, but theſe cannot be recommended.

Caryatides as ſtatues require to be raiſed on pedeſtals. In the Athenian inſtance a continued ſtylobata anſwers this purpoſe. Jean Goujon has uſed inſulated pedeſtals, which are circular, apparently to give more the air of a column to the whole.

The Pandroſium at Athens, though only one example, is of the higheſt importance as being complete in itſelf, giving not only the beſt model of the figures proper for the purpoſe, with their appropriate pedeſtal and entablature, but alſo the relative proportion of ſuch a portico to the adjoining building, and of Caryatides to columns. The entablature, as has been before obſerved, is very remarkable in ſeveral reſpects, and firſt, in height compared to the figures being 2 feet $11\frac{3}{4}$ inches to 7 feet 9 inches. We may perhaps find the motive of this extraordinary weight in conſidering that a human figure amply draped as theſe are, preſents a larger maſs than any column. However, it cannot be denied, that the proportion of the entablature is greatly exaggerated, and produces an unpleaſing effect. In the next place, the frieze is ſuppreſſed, a ſingularity which we believe is not to be found in any other antique monument of the ſmalleſt credit, neither is the effect very good, as the maſs is too much divided into equal parts. On the whole, though it would be abſurd to conclude from a ſingle example, that the ancients had adapted any one particular entablature to this kind of order, we may infer from ſuch remarkable deviations that theſe objects are not to be conſidered within the limits of regular architecture, but are at the diſcretion of the deſigner within the limits of reaſon and taſte.

The proportion of Caryatides to columns when ſeen together, is another point that will require attention in execution. That the firſt ſhould be leſs is evident, but it is impoſſible to ſay what dimenſions will in all caſes have the beſt relation. The figures ought to appear coloſſal without enfeebling the effect of the columns. The proportion obſerved in the Athenian example, where this effect has been very happily attained, are, 7 feet 9 inches, the figures, 18 feet 5 inches, the columns which are the neareſt in contact.

The proper application and allegory of Caryatides will come next under conſideration. Chambray, an able and eloquent author, whoſe opinions always merit attention, obſerves in the "Parallele de l'Architecture antique avec la moderne," that there are few occaſions in which Caryatides can be employed with propriety, though the generality of modern architects have introduced them indifferently in all kinds of buildings. For not only in the palaces of princes, within and without, but in private houſes, and in churches even, and ſepulchres, every place is filled with them without any regard to hiſtory or decorum; and often, by an inſupportable abſurdity, they ſubſtitute for theſe miſerable captives the venerable figures of virtues, muſes, graces, and even angels, where they ought rather to enſlave and confine the vices.

In reply to this, we muſt obſerve, that if the artiſt be confined ſtrictly to the origin and motive attributed to this practice by Vitruvius, he can never employ Caryatic figures. The memorial of an outrageous ſeverity inflicted on the fair and innocent, is unworthy to be perpetuated.

The Perſian gallery of Sparta, though not conſiſtent with the delicacy of modern feelings, was a noble trophy of valour and patriotiſm worthy of the occaſion, and worthy of the people; but the people were Greeks, and the occaſions Thermopylæ and Platea. Such deep injuries, and ſuch glorious revenge, may well juſtify a triumph, that in moderate war would be barbarous and unmanly. Thus did the bone-heap of Murten record and inſpire the patriotic valour of the Swiſs. But the modern artiſt is called upon by every feeling of propriety, to reject theſe emblems of vengeance, theſe miſerable captives, whoſe figures only excite contempt towards the inſulting conqueror.

Caryatic figures are in themſelves more pictureſque and intereſting than any columns, but the proper employment of them is on this account more difficult. They have too much character to enter indifferently into ordinary works. Of a ſtatue we demand an explanation, and the occupation of Caryatides ſeems to render it proper that they ſhould be the repreſentations of allegorical perſonifications rather than of human individuals. A juſt and conſiſtent allegory is then the firſt requiſite of Caryatides; for to repreſent them as mere ſtatues, without any meaning, as Jean Goujon has done, ſeems both an impropriety and a poverty of invention; and with deference to M. Chambray, we can conceive ſituations where the figures of virtues, muſes, and angels, would be both beautiful and proper. Pococke, Norden, Denon. Dict. Meth. Stuart, Daniell. Chambray.

CARYL, Joseph, in *Biography*, one of the miniſters ejected by the act of uniformity, was born in London in 1602, educated in Exeter college, Oxford, and afterwards became preacher to the ſociety of Lincoln's Inn. He was a member of the aſſembly of divines, and one of the tryers for approbation of miniſters; and in all the ſtations he occupied maintained a reſpectable character for learning, piety, and modeſty. By order of parliament he attended the king at Holmby houſe, and was one of the commiſſioners in the treaty of the Iſle of Wight. After his ejectment in 1662, he lived privately in London, and preached to his congregation whenever the times allowed. He was a moderate "Independent," and diſtinguiſhed himſelf by his learned and voluminous "Expoſition on the book of Job." He died in February, 1672-3, in the 71ſt year of his age. Neal's Hiſt. of the Puritans, vol. II. p. 689. 4to.

CARYLL, John, an Engliſh poet of the Roman Catholic perſuaſion, was ſecretary to queen Mary, the wife of James II.; and having ſhared the fallen fortunes of his maſter, was rewarded for his attachment, firſt with knighthood, and afterwards with the honorary titles of earl Caryll and baron Dartford. In the reign of queen Anne he was in England, and recommended to Mr. Pope the ſubject of the "Rape of the Lock," who at its publication addreſſed it to him. He was the author of two plays, viz. "the Engliſh Princeſs, &c." 1667, 4to.; and "Sir Solomon, or the Cautious Coxcomb," 1671, 4to.; and in 1700, he publiſhed the "Pſalms of David, tranſlated from the Vulgate," 12mo. He was living, at a very advanced age, in 1717; but the time of his death is not aſcertained.

CARYOCAR, in *Botany*, Linn. Mant. 247. Schreb. Juſſ. See Pekea.

CARYOCATACTES, in *Ornithology*, the nut-cracker of Engliſh writers, is ſo denominated by Geſner, Willughby, and Ray, whence its Linnæan ſpecific name. See Corvus Caryocatactes.

CARYOCOSTYNUM, in *Pharmacy*, a kind of purging electary, the two principal ingredients of which, that give the denomination to the whole, are cloves, and coſtus. It works briſkly, and fetches the humours from the moſt remote parts; whence, and by reaſon of its warmth, it is preſcribed againſt rheumatic, arthritic, hydropic, paralytic, &c. diſorders.

CARYOLOBIS, in *Botany*, a genus formed by Gærtner for the ſeed of an unknown Eaſt Indian plant, remarkable for its ſingular ſtructure, having within it a central pillar which perforates the axis of the embryo. It is ſaid by Boſc, to be nearly allied to Cocoloba.

CARYONES, in *Ancient Geography*, a people placed by Ptolemy in European Sarmatia, between the Alans and Amaxobians. M. Peyſſonel claſſes them among thoſe who bore the name of Vandals.

CARYOPHYLLASTER, in *Botany*. Rumph. amb. See DODONÆA *viſcoſa*.

CARYOPHYLLATA. Tournefort, claſs 6. § 7. gen. 6. La Marck, Flor. Franc. 742. and Encyc. ſub Benoite. See GEUM.

CARYOPHYLLATA, Dod. Brunf. C. vulgaris, Bauh. Pin. C. urbana, Scop. See GEUM *urbanum*.

CARYOPHYLLATA, *virginiana*, Herm.' par. See GEUM *virginianum*.

CARYOPHYLLATA *aquatica*, Bauh. Pin. C. ſepentrionalium, Lob. C. rivalis Scop. C. nutans, Crantz. See GEUM *rivale*.

CARYOPHYLLATA *alpina lutea, et minor*, Bauh. Pin. Barrel. C. montana, Scop. See GEUM *montanum*.

CARYOPHYLLATA *alpina, apii foliis*, Bauh. pin. C. alpina tenuifolia, Barrel. See GEUM *reptans*.

CARYOPHYLLATA *alpina quinquefolia*, Bauh. pin. See ANEMONE *narciſſiflora*.

CARYOPHYLLEI, in *Botany*, the forty ſecond natural order in the Philoſophia Botanica of Linnæus, and the twenty-ſecond in the Prælections publiſhed by Giſche; ſo called, not as including the caryophyllus of Linnæus, which actually belongs to a different natural order; but in reference to the caryophyllus of Tournefort taken up by him from the older botaniſts, which Linnæus called Dianthus without aſſigning a ſufficient reaſon for changing the name, and as he ſtill continued to call the natural order of which his dianthus may be conſidered as the prototype, by its ancient appellation, with a certainty of introducing a palpable confuſion into the nomenclature. He has been followed in both caſes by Juſſieu, without a comment; and by Ventenat, with a remark pointing out the inconſiſtence. Linnæus gives it the following character. *Root* fibrous. *Stem* herbaceous, ſeldom ſhrubby, jointed: branches generally alternate. *Leaves* ſimple, almoſt always inclining to lanceolate, undivided, ſeſſile, or narrowing into a petiole, oppoſite, obvolute, moſt commonly ſmooth. *Flower* rarely ſeſſile; ſtamens either equal or double the number of the petals; piſtils from one to five. *Fruit* a capſule, one-celled, or with as many cells as there are ſtyles.

The genera enumerated in Philoſophia Botanica are dianthus, ſaponaria, drypis, cucubalus, ſilene, lychnis, coronaria, agroſtemma, frankenia, alſine, ceraſtium, holoſteum, arenaria, pharnaceum, ſpergula, ſagina, moerhingia, ſcleranthus. In the poſthumous lectures they are divided into four ſections; α. dianthus, ſaponaria, gypſophila, velezia, drypis, ſilene, cucubalus, lychnis, agroſtemna, ſheffieldia? β. ſpergula, ceraſtium, arenaria, ſtellaria, alſine, holoſteum, cherleria, ſagina, mœhringia, buffonia. γ. pharnaceum, glinus, mollugo, polycarpon, minuartia, queria, ortega, lœflingia, rotala. δ. ſcleranthus, polypremum. The firſt ſection comprehends the proper caryophyllate flowers of Tournefort, which have a tubular calyx, and unguiculated petals with a flat border.

Juſſieu and Ventenat have given in moſt reſpects the ſame general character, and aſſigned nearly the ſame genera to their caryophylleæ. According to Ventenat the plants of this family are in general herbaceous and natives of Europe. Their *ſtems* are commonly cylindrical, and never more than three or four feet high; branches axillary, oppoſite and apparently articulated at each knot. *Leaves* oppoſite and connate at their baſe, very rarely whorled, always ſimple and entire, generally deſtitute of ſtipules. *Flowers* almoſt always hermaphrodite, ſubject to become full or double by cultivation, commonly axillary, ſometimes terminal. *Calyx* one-leafed or divided, almoſt always permanent. *Corolla* rarely none; petals generally unguiculate, equal in number and alternate with the ſegments of the calyx. *Stamens* in ſome genera leſs numerous than the petals; more frequently equal in number and alternate with them; or twice as many, half of them inſerted into the receptacle, and the other half alternately into the petals. *Germ* ſimple; ſtyle rarely ſingle; ſtigmas equal in number to the ſtyles. *Fruit* capſular, almoſt always many-ſeeded, one or many-celled. *Seeds* inſerted into a central placenta or receptacle, or each of them attached to the bottom of the capſule by a ſmall umbilical cord. Periſperm farinaceous, central, i. e. ſurrounded by the ſpiral embrio. Radicle inferior.

The whole order is divided by Juſſieu into ſeven ſections. 1. Calyx divided; ſtamens three; ſtyle ſingle or triple. ortegia, lœflingia, holoſteum, polycarpon, donatia, mollugo, minuartia, queria. 2. Calyx divided; ſtamens four; ſtyles two or four. Buffonia, ſagina. 3. Calyx divided; ſtamens five or eight; ſtyles two, three or four. Alſine, pharnaceum, mœhrhingia, elatine. 4. Calyx divided; ſtamens ten; ſtyles three or five. Bergia, ſpergula, ceraſtium, cherleria, arenaria, ſtellaria. 5. Calyx tubular; ſtamens ten, generally inſerted alternately into the receptacle, and petals; ſtyles two, three, or five. Gypſophila, ſaponaria, dianthus, ſilene, cucubalus, lychnis, agroſtemma. 6. Calyx tubular; ſtamens leſs than ten; ſtyles two or three. Velezia, drypis, ſarothra. 7. Genera allied to the caryophylleæ. Rotala, frankenia, linum, lechea. Ventenat has adopted the ſame diviſions, but has omitted donatia, bergia, and rotala; added hagæa, and githago; and removed ſarothra to the gentianæ.

CARYOPHYLLON *Plinii*, the fruit of the *caſſia caryophyllata*, or cloveberry tree, whoſe bark is uſed in medicine

CARYOPHYLLUS, in *Botany*. (Gr. καρυοφυλλον, nut-leaf. Paul. Æginetus). Clove-tree, Giroflier, Fr. Linn. gen. 669. Schreb. 843. Gært. 202. Juſſ. p. 324. Vent. vol. 3. p. 327. Claſs and Ord. *Polyandria monogynia*, Linn. *Icoſandria*, Schreb. Lam. Nat. Ord. *Heſperideæ*, Linn. *Myrti*, Juſſ.

Gen. Ch. *Cal.* Perianth ſuperior, ſmall, permanent; ſegments four, concave, ſpreading, *Cor.* petals four, roundiſh, larger than the calyx and alternate, with its ſegments caducous. *Stam.* numerous; filaments capillary, a little longer than the petals (but not ſo expreſſed, either in Sonnerat's, Woodville's, or La Marck's figures), attached to the outſide of a quadrangular, hollow elevation within the ſegments of the calyx; anthers ſmall. *Piſt.* germ inferior, oblong, two-celled; ſtyle ſimple, in the centre of the quadrangular elevation, but perfectly diſtinct from it; ſtigma ſimple. *Peric.* Berry oval-oblong, one or two-celled, crowned with the permanent calyx, and quadrangular elevation. *Seeds* one or two, large.

Eſſ. Ch. *Cor.* four petalled. *Cal.* four-cleft. *Berry* inferior, one or two-celled.

Sp. 1. C. *aromaticus*, Linn. Sp. Pl. Bauh. pin. p. 410. Tourn. app. p. 661. Pluk. Alm. tab. 155. fig. 1. Rumph. amb. tab. 1, 2. Sonnerat. guin. nov. tab. 119. Woodv. med. bot. tab. 135. Gært. tab. 33. Lam. Illuſt. tab. 417. (Eugenia caryophyllata, Willd. Garyophili,

phili, Lob. ic. 2. p. 147. Tſhinka, Piſon. arom. p. 177.) "Leaves lanceolate, acuminate." A ſmall tree. *Trunk* from fifteen to thirty feet high, a foot thick, dividing into branches four or five feet from the ground, and forming a denſe, pyramidal head; branches oppoſite, ſlender, generally horizontal, but ſo weak as to ſtand in need of ſupport when loaded with fruit. *Leaves* from two inches and a half to four inches long, near an inch and a half broad, with a ſtrong midrib, and parallel lateral nerves, oppoſite, tapering at both ends, quite entire, ſmooth on both ſides, reddiſh and rather ſhining above, bright green underneath, and beſprinkled with minute reſinous points, which placed under a magnifier in a ſtrong light, are generally tranſparent; petioles from ſix to nine lines long, red, and according to Sonnerat, the moſt aromatic part of the plant. In Sonnerat's and Woodville's figures, they are much ſhorter than in La Marck's, and ſoon begin to expand into the proper leaf. *Flowers* odorous, from nine to fifteen or more on a branch, growing often by threes on partial peduncles in terminal cymes, or rather corymbous panicles; filaments white; anthers yellow; peduncles ſmooth: bractes two under each diviſion of the panicle, and at the baſe of each flower very ſmall, caducous. There is a variety figured by Rumphius with four larger bractes, which Linnæus ſeems to have miſtaken for a ſecond calyx, or as he calls it a perianth of the fruit placed under the germ, in contradiſtinction to the ſuperior perianth of the flower. *Fruit* coriaceous, reddiſh brown, oval-oblong, not falling ſpontaneouſly from the tree till the enſuing year. The bark, fruit, roots, and leaves, are all more or leſs aromatic. A native of moiſt ſituations in the Molucca iſlands and New Guinea. 2. C. *obtuſifolius.* Sonnerat nov. guin. pl. 120. "Leaves ovate-wedge-ſhaped, obtuſe." All parts of the plant ſcentleſs. *Leaves* rounded at their ſummit, pale green, on long petioles; cloves bitter. Sonnerat's figure repreſents a branch with only two terminal flowers. A native of New Guinea.

Sonnerat mentions another ſcentleſs ſpecies or variety differing from the preceding, in having the ſegments of the calyx extremely long and acute. Loureiro found in Cochinchina what appears to be ſtill a different ſpecies with ſcarcely any ſmell or taſte, which he thus deſcribes. A middle-ſized tree with few branches. *Leaves* broad-lanceolate, quite entire, ſmooth, oppoſite, petioled. *Flowers* white; peduncles many-flowered, regular, upright, terminal; calyx tubular, oblong, four-cleft; ſegments acute, ſhort, ſomewhat upright; petals roundiſh, concave, ſmall. *Pericarp* a calycine berry, ovate oblong, corticoſe, pale brown, crowned with the ſegments of the calyx. *Seed* ſingle.

Obſ. The clove ſpice does not appear to have been known by the ancient Greeks and Romans. Diodonæus, indeed, has conjectured, and Bodæus a Stapel agrees with him in thinking, that the tender branches of this tree are the real cinnamon of the ancients; but as far as we are able to judge, the ſuppoſition is without probability. The firſt diſtinct mention of it is by Paulus Œgineta, a Greek phyſician of the ſeventh century, who obſerves that it does not correſpond with its name which ſeems to imply a leaf in the ſhape of a nut, and of which Mr. Ray long after acknowledged that he could not gueſs the meaning; but is properly a kind of rod-like flower, the produce of an Indian tree. He ſays it is of a dark colour, about the thickneſs of a finger in length, aromatic, acrid, ſomewhat bitter, warm and dry in the third degree, much uſed, both in food and as a medicine. It was probably firſt brought into Greece from Arabia, as it correſponds ſufficiently with the deſcription of the Carunſel of Serapion, an Arabian phyſician nearly contemporary with Paulus Œgineta, and of the Charunſel Iellum of Avicenna, another phyſician of the ſame country, who flouriſhed at the beginning of the eleventh century. When the Portugueſe began to navigate the Indian ſeas about the cloſe of the fifteenth century, they ſoon became ſenſible of the value of the clove as an article of commerce, and are ſaid to have ſown many thouſand ſeeds in the iſland of Amboyna, about four years before it was taken by the Dutch. To this iſland and the neighbouring ſmaller ones of Honimſa, Oma, and Nouſſa lant, commonly called the Ulaſſiers, its new maſters, with that narrow ſpirit of mercantile ſelfiſhneſs which is ſo generally attributed to them as a national characteriſtic, have long wiſhed to confine its cultivation, that they might monopolize the ſale of it to themſelves and have it in their power to fix upon it their own price. For this purpoſe, about the middle of the laſt century they compelled the kings of Ternate, Tidore, Machian and Bachian, and afterwards made a ſimilar contract with the king of Bouton, to accept an annual payment, as a recompence for ſuffering the clove-tree to be extirpated throughout their dominions, and for aſſiſting the Dutch agents in their periodical circuit of devaſtation. The king of Ternate is ſaid by Du Tour in Nouv. Dict. to have received annually about eighteen thouſand rix-dollars, near four thouſand pounds ſterling; but according to Stavorinus, the king of Bouton received lately only 150 rix-dollars, or 32l. 14s. 6d. which is repreſented as a conſiderable ſum in his treaſury. The Dutch Eaſt India company are alſo bound to take at a fixed price all the cloves raiſed by the inhabitants of Amboyna. Beſides theſe reſtrictions, they have ſometimes thought fit to reduce the number in the iſlands appropriated to their growth. In 1769 it was ordered by them that more than five hundred thouſand ſhould not be ſuffered to remain in the iſland of Amboyna; in 1773, fifty thouſand more were deſtroyed. But notwithſtanding all the efforts of their illiberal policy, the clove tree is now known to grow ſo abundantly in New Guinea, and many other iſlands over which they have never obtained any influence, that even if there were a probability of their riſing from their preſent degraded ſtate, and recovering their former rank in the ſcale of nations, it would not be poſſible for them to renew ſo odious a monopoly. So long ago as 1770 the patriotic M. Poivre, then intendant of the iſle of Bourbon, ſent two ſhips to the ſpice iſlands under the direction of M. Prevoſt, a confidential friend well acquainted with the navigation of their coaſts, for the expreſs purpoſe of obtaining living plants and ſeeds to be cultivated in the French colonies. After ſeveral unſucceſsful attempts, this able negotiator obtained from the kings of Gebi and Palam in the iſland of Ceram, ſovereigns entirely independent of the Dutch Eaſt India company, a great number of plants both of the clove and nutmeg tree, as well as of ripe berries and nuts. In the year 1771 M. Prevoſt made another voyage to Gebi and returned in 1772 with a ſtill more abundant cargo of trees and ſeeds. They were planted by M. Poivre in a magnificent garden prepared for them in the iſle of France, whence they were afterwards exported in conſiderable quantities to Cayenne and Martinico. In Cayenne 4400 clove trees were gradually raiſed between the years 1779 and 1784, excluſive of thoſe which had been diſtributed among private individuals. In 1785 the oldeſt of them, then of ſix years growth, produced a few ſmall flowers; and two pounds and a half of cloves were collected from them. In 1786 the crop amounted to 95 pounds; and in 1787 to 273 pounds, when Lavoiſier and the Count de la Luzerne were appointed to examine them and report their quality to the French government. The cloves of Cayenne proved equal to thoſe of the Eaſt Indies, and were even found to afford a larger proportion of eſſential oil. In 1792 the plantation contained 4500 fruit-bearing trees; and a merchant of Bourdeaux had ſold in the preceding year 700 pounds of Cayenne cloves at a lower price than was aſked for thoſe from the Moluccas. The ſucceſs of the plants ſent to Martinico was not known to Du Tour, from whom theſe details are taken, that iſland having ſoon afterwards ſurrendered to the Britiſh arms; but we learn from the tranſlator of Stavorinus's voyages to the Eaſt Indies, that in 1797, 305 pounds of cloves were imported into the port of London from Martinico, and in 1798, 200 pounds from the ſame iſland and 2981 from St. Kitts.

This ſpice, ſo much ſought for in commerce, and ſo much eſteemed by epicures, is not the ripe fruit of the plant, but the bud of the flower, which is found by experience to loſe much of its aromatic quality if ſuffered to remain on the tree till the anthers have diſcharged their pollen, and the germ has become impregnated. In Amboyna it makes its firſt appearance at the beginning of the rainy ſeaſon, and is of a dark green colour. In Auguſt and September it acquires its proper ſhape, and then gradually paſſes from green to yellow, and from yellow to red; but ſtill has its ſtamens completely ſhut up in the unopened petals, which form a kind of globular button at the top of the calyx and germ. In that ſtate it has a ſtrong reſemblance to a ſmall nail; of which the cloſed petals and expanded ſegments of the calyx compoſe the head, and the germ, gradually tapering to a bluntiſh point, the lower extremities. The reſemblance is ſo ſtriking, that it has given riſe to the vulgar name by which this article of commerce is known in moſt nations of Europe. The Dutch call it naghel, the Spaniards clavo, the Italians chiodo, and the French clou, from which the Engliſh word clove is evidently derived. When the cloves have thus arrived at what may be properly called their mercantile ſtate of maturity, thoſe within reach are gathered by the hand, and the reſt, as moſt authors aſſert, are beaten down by poles or reeds; but, according to Stavorinus, are cut off with long hooks. The latter is the more probable account; for, as Mr. Ray obſerves, it is not eaſy to conceive how unripe fruit which in a healthy ſtate is uſually ſtrongly attached to the tree, can be forcibly beaten off, without breaking or materially bruiſing the tender branches, which at the ſame time is expreſsly ſaid to be carefully avoided, as a certain detriment to the crop of the enſuing year. The ſeaſon of gathering continues from October to February. The cloves, as ſoon as they are gathered, are dried either in ſmoke over a fire, in the ſun, or in a kiln. Stavorinus aſſerts that thoſe which are dried in ſmoke are not good, and may be diſtinguiſhed by their blacker colour, and their bending between the fingers: whereas thoſe dried in the ſun are of a reddiſh caſt, and are not flexible, but brittle, ſnapping aſunder upon being fillipped by the finger. Du Tour obſerves, that the oily part of the clove is beſt preſerved when it is dried in a kiln. Thoſe are always preferred in the market which appear plump, and leave an oilineſs on the fingers when preſſed, which have moſt of the aromatic taſte and ſmell, and which retain the globular unexpanded corolla, a certain proof that they have not continued too long on the tree.

They are uſed in their native climate, and in almoſt every part of the civilized world, as an article of luxury, communicating a pleaſing flavour to preſerved fruit, ſauces, ragouts, and liqueurs. They are likewiſe employed by the perfumer. In medicine they are eſteemed tonic, cordial, and exhilarating, acting as a powerful ſtimulant to the muſcular fibres, and ſuperior to moſt of their claſs in caſes of atonic gout, paralyſis, &c. They have a ſtrong agreeable ſmell, and a bitteriſh, hot, but not very pungent taſte, qualities which are completely extracted by rectified ſpirit. To water they communicate more of their ſmell, but leſs of their taſte; and in diſtillation with water, they yield one-ſixth of their weight of eſſential oil, ſmelling ſtrongly of cloves, but leſs pungent than the ſpirituous extract. This oil is an article of the Pharmacopœias, and enters into ſeveral officinal compoſitions. It often gives inſtant eaſe in the tooth-ach; and is uſed with benefit as an external application in paralytic and lethargic affections. That which is commonly met with in the ſhops, and received from the Dutch, is much more acrimonious than the genuine diſtilled oil, and is probably ſophiſticated by an admixture with the reſinous part of the cloves, from which it receives its peculiar acrimony and high colour.

Valentyn deſcribes four ſorts of cloves; that which he calls the male is the ſort uſed for drying; the female is of a pale colour, and the beſt for extracting oil; the king's clove is a very ſcarce ſpecies, bearing larger and double fruit, and is perhaps that figured by Rumphius, which he calls regium; the fourth ſort, or rice-cloves, are very ſmall, and likewiſe very rare. Whether the trees which produce theſe different kinds are diſtinct ſpecies, or only varieties, we cannot determine.

The berries which ripen on the tree are emphatically called mother-cloves, as being chiefly deſtined to give birth to a future progeny. The Dutch, however, preſerve them in ſugar, and value them as an uſeful aſſiſtant to digeſtion, and a pleaſant antiſcorbutic ſea-ſtore. See Bodæus a Stapel's Notes to Theophraſtus, Raii Hiſtoria Plantarum, Stavorinus's Voyages to the Eaſt Indies, Sonnerat's Voyage to New Guinea, Woodville's Medical Botany, La Marck in Encyclopedie, and Du Tour in Nouveau Dictionaire, under Epice and Geroflier.

On re-conſidering the ſubject, ſince the article Caryophyllei was drawn up and ſent to the preſs, we are convinced that Linnæus was right in retaining for the Aſiatic ſpice the name of Caryophyllus, which had been originally formed for it by the Greek merchants of the middle ages, who ſeem to have miſtaken the dried cloves for the leaves of the plant; and that he had no alternative but to invent a new one for the European plants, which could not poſſibly be arranged under the ſame genus, although they had received the ſame appellation from the earlier modern botaniſts, on account, as Mr. Ray has obſerved, of ſome reſemblance to the ſmell of the original caryophyllus, or clove, in one of the ſpecies at leaſt which is ſtill called by gardeners the clove pink. (*Dianthus caryophyllus*, Linn.). He is to be cenſured only for diſtinguiſhing, by the name of Caryophyllei, a natural order which does not contain the true Caryophyllus, and which he might have been led by an obvious analogy to call Dianthei. It is ſurpriſing that he ſhould have been followed by Juſſieu in ſo groſs an impropriety.

CARYOPHYLLUS *arvenſis glaber*, Bauh. Prod. 105. See AIRA *caryophyllea*.

CARYOPHYLLUS *arvenſis umbellatus*, Bauh. Pin. 210. See HOLOSTEUM *umbellatum*.

CARYOPHYLLUS *ſpurius inodorus*, Sloan. Jam. Cates C. Car. 2. See CORDIA *ſebeſtena*.

CARYOPHYLLUS *montanus major & minor*, Bauh. Pin. 211. See STATICE *armeria*.

CARYOPHYLLUS *cæruleus monſpelienſium*, Bauh. Pin. 209. See APHYLLANTHES *monſpelienſis*.

CARYOPHYLLUS *langueſcente vi aromaticus*, Pluk. Alm. tab. 274. fig. 2. See EUGENIA *caryophillifolia*.

CARYOPHYLLUS *ſaxatilis foliis gramineis umbellatis corymbis*. —*Saxatilis fol. gram. minor.*—*Minimus muralis*, Bauh. pin. 111. See GYSOPHILA *faſtigiata, repens, & muralis*.

CARYOPHYLLUS *hortenſis barbatus latifolius & anguſtifolius*.

—*Sylveſtris vulgaris latifolius.—Barbatus ſylveſtris.—Sylveſtris prolifer.—Hortenſis ſimplex, flore majore, altilis major, & maximus ruber.—Sylveſtris biflorus.—Simplex ſupinus latifolius.—Sylveſtris flore laciniato ſine corniculis odoro.—Sylv. alter, flore laciniato odoratiſſimo.—Syl. repens multiflorus.—Pumilis latifolius, & ſyl. flore magno inodoro hirſuto.—Arboreſcens creticus.* Bauh. Pin. p. 208, 209, 210. See Dianthus *barbatus, carthuſianorum, armeria, prolifer, caryophyllus, ſylveſtris, deltoides, plumarius, ſuperbus, virgineus, alpinus, & arboreſcens.*

Caryophyllus *ſaxatilis ſtrigoſior,* Bauh. Pin. See Dianthus *filiformis.*

Caryophyllus *græcus arboreus.—Creticus arboreus,* Tournef. Cor. 23. See Dianthus *arboreus & juniperinus.*

Caryophyllus *alpinus calyce oblongo hirſuto,* Bauh. Pin. 209. See Cucubalus *pumilis.*

Caryophyllus *holoſteus alpinus gramineus.—Saxifragus,* Bauh. Pin. p. 210, 211. See Silene *rupeſtris & ſaxifraga.*

Caryophyllus *holoſteus arvenſis flore majore.—Arvenſis glaber flore minore,* Bauh. Pin. p. 210. See Stellaria *holoſtea & graminea.*

Caryophyllus *ſaxatilis, ericæ foliis, umbellatis corymbis,* Bauh. Pin. p. 211. See Arenaria *tetraquetra.*

Caryophyllus *pratenſis flore laciniato ſimplici,* Bauh. Pin. 210. See Lychnis *flos cuculi.*

Caryophyllus *holoſteus alpinus latifolius.—Holoſteus tomentoſus latifolius & anguſtifolius,* Bauh. Pin. 210. See Cerastium *latifolium & tomentoſum.*

Caryophyllus, Brown Jamaic. & Pluk. Alm. tab. 155. fig. 3, 4. See Myrtus.

Caryophyllus *indicus,* Cam. Epit. 406. See Tagetes *erecta.*

Caryophyllus, *fungites ſive caryophyllus marinus, plancus,* in *Natural Hiſtory,* one of the ſynonyms of Madrepora *ramea.*

CARYOTA, in *Botany,* (Καρυωτις, Dioſc. Καρυωτος φοινιξ, Ætius, a palm, bearing nuts.) Linn. gen. 1228. Schreb. 1701. Juſſ. 38. Vent. 2. 129. Gært. 25. Nat. Ord. *Palmæ* (*Monœcia polyandria*).

Gen. Ch. Male *Cal.* ſpathe univerſal; ſpadix branched; proper perianth three-leafed, Linn. (ſix-leafed, Gært.; ſix-cleft; the three outer ſegments ſhort, not deeply divided, Vent.; ſhort, membranous, entire, forming a little cup, Lam.) *Cor.* three-cleft, Linn. (of three oblong, concave, petals, Lam.; none, Gært. Vent.) *Stam.* numerous; anthers linear. Female. Perianth and corolla as in the male. *Piſt.* germ ſuperior, roundiſh; ſtyle acuminate, ſhort; ſtigma ſimple, (twin, Gært.) *Fruit* berry roundiſh, one-celled. *Seeds* one or two, large, flat on one ſide, convex on the other.

Eſſ. Ch. Male. *Calyx* common. *Cor.* three-cleft. *Stam.* numerous. Female. *Piſt.* one; berry two-ſeeded, Linn.

Sp. 1. C. *urens,* Linn. Sp. Pl. Gært. tab. 7. fig. 3. Lam. Illuſt. Pl. 897. (Schunda-panna, Rheed. Mal. 1. tab. 11. Seguaſter major, Rumph. Amb. 1. tab. 14.) "Fronds bipinnate; leaflets ſeſſile; berry two-ſeeded." *Trunk* frequently ſo large as to be ſcarcely embraced by two men; riſing to a conſiderable height, but not ſo high as the cocoa-palm; bark greyiſh; wood hard, ſolid, heavy; pith white. *Leaves* or fronds large, forming an ample head, twice winged; pinnules ſmall with reſpect to the ſize of the leaf, wedge-ſhaped, obliquely truncated, and gnawed on the upper edge, finely ſtriated lengthwiſe, browniſh-green, ſhining. *Spathe* many-leafed, axillary within the loweſt leaf. *Flowers* in pairs, on long, pendulous ſpikes, firſt green, then red or purple, finally yellow; filaments nearly as long as the petals. Berry about the ſize of a plum, globular, ſucculent, almoſt black when ripe; rind thin; pulp ſoft and red, very ſharp and acrid. *Seeds* generally two, ſometimes only one, wrinkled, hard. The farina of its pith reſembles that of ſago, but is leſs pleaſant. A native of the Eaſt Indies. 2. C. *mitis,* Mart. Mil. Loureiro Cochin. 569. "Fronds bipinnate; petioles of the pinnules nodding; berry one-ſeeded." *Trunk* fifteen feet high, two inches thick, very ſtraight and regular. *Leaves* four feet long; pinnules wedge-ſhaped, many-nerved, obliquely bitten, on long ſlender petioles. *Spathe* ſimple, oblong, rather acute. *Spadix* branched; ſpikes ſimple, long. *Flowers* regularly diſpoſed, with ſingle females between pairs of males; filaments none; perianth of the females five-leafed; ſtigma bifid. *Fruit* about the ſize of a muſket ſhot, round, coriaceous, ſmooth, black; pulp mild. *Seed* pale, ſoftiſh. A native of Cochinchina.

CARYSFORT, in *Geography,* a very ſmall village, if indeed it can be called more than a houſe, in the county of Wicklow, Ireland, 7 miles S.W. from Wicklow, and 31 from Dublin. Before the union it ſent two members to parliament, but it does not appear to have been ever a place of importance. Near it is Croaghan mountain, where gold was procured. See Croaghan.

CARYSIS, in *Ancient Geography,* an iſland of Aſia Minor, on the coaſt of Lycia, which belonged to the inhabitants of Caria, according to Steph. Byz. It was one of the three ſmall iſlands, Cryéon, ſituate at the bottom of the north-weſt part of the gulf of Glaucus.

CARYSTIUM *linum.* See Linum *caryſtium.*

Carystium *marmor.* See Marmor.

CARYSTUS, in *Ancient Geography,* a town of Greece, in the iſland of Eubœa, ſituated in the ſouthern part of the iſland, at the bottom of a ſmall gulf which opened to the ſouth-weſt. It was famous for the quarries of marble which were found in mount Ocha, at the foot of which it was ſituated. This marble was in high eſtimation among the Romans. Strabo ſays that this high mountain furniſhed the well known aſbeſtos or amianthus. Ptolemy calls this town Caryſte, and it is ſaid to have derived its name from Caryſtus, the ſon of Chiron; whence it was alſo called Chironia; and it was likewiſe denominated Ægea, from Ægon, who is ſaid to have reigned here, and is ſuppoſed by Stephanus to have given his name to the Ægean ſea. The inhabitants of Caryſtus worſhipped the god Briareus, who, according to Homer, was the ſame with Ægeon, adored by the Chalcidians; the name of Ægeon being given to him, as he tells us, by men, and that of Briareus by the immortal gods. Caryſtus has been ſince called Cariſto, and Caſtel Roſſo.

CARYUS, in the *Materia Medica,* a name given by Dioſcorides, and ſome other of the ancient Greeks, to the *eryngium,* or ſea-holly, called by us *eryngo.* It was thus named from its having a ſmall head or cluſter of flowers like a walnut. See Eryngium.

CAS, St. *Bay,* in *Geography,* a bay of the Engliſh channel, on the N.W. coaſt of France, where in 1758 the Engliſh made an unſucceſsful landing, with the loſs of about 1000 men. It derives its name from that of a village near it. It is 10 miles W. of St. Maloes, and 5 S.E. of cape Frehel.

CASA, John De La, in *Biography,* a celebrated Italian writer, was the deſcendant of a noble family at Florence, and born in 1503. Having been educated at Bologna, and afterwards having purſued his ſtudies for ſome time at Florence, under Ubaldino Bandinelli, he ſettled at Rome, and, in 1538, became clerk of the apoſtolical chamber. With the elegant and claſſical ſtudies to which he was devoted, he combined, as was too frequently the caſe, the licentious manners of the capital; and as the fruit of his amours, he had a natural ſon, whom he named Quirino. In 1540 he became a member of the newly inſtituted Florentine academy; and in 1544 he was made archbiſhop of Benevento, and alſo diſpatched as nuncio to Venice. Failing to engage the Venetians to join in a league with pope Paul III. and Henry II. king of France, for controuling the dreaded power of Charles V., which was one object of his miſſion; he ſucceeded in another, for the purpoſe of carrying on a proceſs againſt Vergerio, formerly the pope's nuncio in Germany, who had become a Lutheran. But although he drove him from Italy, Vergerio amply avenged himſelf by the injury which he did to Caſa's reputation in Europe. Under the pontificate of Julius III. he was involved in the diſgrace of cardinal Alexander Farneſe, and obliged to quit Rome, and to retire to Venice, in the vicinity of which he paſſed ſeveral years in the private proſecution of his ſtudies. Upon the election of Paul IV. he was recalled to Rome, and appointed ſecretary of ſtate; but he never advanced to the rank of cardinal, which ſome have aſcribed to the licentious writings of his youth. He died of the gout in 1556, at the age of 53 years.

John de la Caſa has been always regarded as one of the politeſt writers of the moſt flouriſhing age of Italian literature, and one of the principal models of the pure Tuſcan dialect. His verſes, though defective in ſtyle, excel in elevation of ſentiment and livelineſs of imagery. Deviating from the courſe purſued by Petrarch and his imitators, he aimed at ſubſtituting a ſublime and noble gravity to their perpetual ſoftneſs and tenderneſs. He alſo adopted in his youth the burleſque manner of Berni, and other writers; and in this ſtyle of compoſition he wrote his famous "Capitolo del Forno," which, by its extreme indecency, fixed an indelible reproach on his name and character. This piece, and ſome more of his performances, have been ſuppreſſed in all late editions of his works; but they are printed among other compoſitions of a ſimilar kind by Berni, Mauro, and others, at Venice in 1538. His Italian letters are elegant, but defective in point of eaſe and familiarity. His moſt celebrated work in Italian proſe is the "Galateo," or Art of living in the World, which is a kind of ſyſtem of politeneſs, that has been much eſteemed, and tranſlated into moſt of the languages of Europe. His orations have been much admired, as finiſhed pieces of artificial eloquence. As a writer of Latin in proſe and verſe, Caſa is one of the happieſt imitators of the ancients, and his lives of the cardinals, Contarini, and Bembo, are maſter-pieces of their kind. His knowledge of Greek was diſplayed by elegant tranſlations of the orations in Thucydides, and of that writer's deſcription of the peſtilence at Athens. Of the numerous editions of his works, that of Venice in 5 vols. 4to. 1728, is reckoned the moſt valuable, on account of its illuſtrations and biographical anecdotes. Gen. Dict. Gen. Biog.

CASA, in *Ancient* and *Middle Age Writers*, is uſed to denote a cottage or houſe.

CASA *Santa*, denotes the chapel of the Holy Virgin at Loretto. This is properly the houſe, or rather chamber, in which the Bleſſed Virgin is ſaid to have been born, where ſhe was betrothed to her ſpouſe Joſeph, where the angel ſaluted her, the Holy Ghoſt overſhadowed her, and, by conſequence, where the Son of God was conceived, or incarnated. It is pretended to have been carried in May, 1291, through the air from Galilee to Terſato, in Dalmatia, by angels; and 4½ years afterwards to have been removed to Italy, where about midnight, in December 1294, it was ſet down in a wood, in the diſtrict of Recanati, about a thouſand paces from the ſea. But it was nearly 200 years in Italy before any author of that country took any notice of it. Of this building the Catholics tell many other wonderful ſtories, too childiſh to tranſcribe.

The Santa Caſa, or holy chamber, conſiſts of one room, the length of which is 31¾ feet, the breadth 13 feet and nearly 3 inches, and the height 18¾ feet. Formerly it had only a timber ceiling; but, leſt by a great number of lights continually burning it ſhould happen to take fire, Clement VII. cauſed a vaulted roof to be made. It was alſo ſtrongly compacted with rafters, boards, and ropes, and ſupported by machines till the new foundation was carried up, ſo as to be joined with the old walls of the houſe. On the ceiling is painted the aſſumption of the Virgin Mary. On the weſt ſide of the window, through which the angel came into the houſe, and facing it, in a niche, ſtands the image called the great *Madona*, or lady, five feet high, made of cedar, and, as they ſay, wrought by St. Luke, who was a carver as well as a phyſician. The mantle or robe ſhe has on, is covered with innumerable jewels of ineſtimable value. She has a triple crown of gold, enriched with pearls and diamonds, given her by Lewis XIII. of France, and a little crown for the child Jeſus. The niche in which the image ſtands is adorned with 71 large Bohemian topazes; and on the right ſide of the image is an angel of caſt gold, profuſely enriched with diamonds and other gems, which is ſaid to have coſt 50,000 ducats, and which was offered by Maria Beatrix Eleonora, of the houſe of Eſte, queen of king James II. of England, that, by the interceſſion of the Virgin Mary, ſhe might conceive a ſon. Accordingly, ſoon after, as it is ſaid, ſhe had a ſon; who has ſince occaſioned ſo much noiſe in Europe, under the name of the pretender to the Britiſh crown. On the left ſide of the Virgin's image is a ſilver angel; and on the right hand another coſtly one, which was the gift of Lewis XIII. king of France for the birth of the dauphin, afterwards Lewis XIV. The robe which this famous image wore, when it was brought from Dalmatia into Italy, is of red camlet, and kept in a glaſs ſhrine. The diſh out of which ſhe and her divine infant are ſaid to have eaten is a ſhallow bowl, of glazed earthen ware, plated over with ſilver. This utenſil is not only kiſſed, but roſaries, medals, agnus dei's, crucifixes, and paper caps, painted with the image of the Madona of Loretto, are rubbed againſt it, from a firm perſuaſion that they thus become an infallible remedy againſt the head-ache, and other diſeaſes. Seven golden lamps are continually burning before the image; and other parts of the Caſa Santa are illuminated by 37 ſilver lamps, which are ſupplied with oil out of legacies bequeathed, and ample funds eſtabliſhed for this purpoſe. Notwithſtanding the mean appearance of the walls within the Caſa Santa, the outſide is elegantly adorned with the fineſt Carrara marble, which caſe of marble was begun in 1514, in the pontificate of Leo X and conſecrated in 1538 by Paul. III. The expence of this caſing was enormous, and the moſt celebrated ſculptors of the age were employed in adorning it. The edifice which encloſes the holy houſe was deſigned by Bramante, and the ſculpture was deſigned and executed by the moſt famous artiſts. It was completed in 1579, and Gregory XIII. had the honour of finiſhing this ſuperb work. On the top of the Caſa Santa is a little tower, in which are hung two ſmall bells, that are rung in violent tempeſts of thunder and lightning, under a notion that their ſound will diſperſe the ſtorm, and prevent any injurious effects. There is one part of the Caſa Santa which may be regarded as the holy of holies: for it is ſeparated from the other part by a ſilver baluſtrade, and a gate of the ſame metal. It is ſaid to be the ſpot where the Virgin was ſitting when the angel Gabriel appeared to her at the time of the annunciation. The large church in which the caſe of the Caſa Santa ſtands, as if it were under a tent, is built of Iſtrian ſtone, reſembling the Travertino ſtone uſed at Rome. The front is wholly of marble, and embelliſhed with very fine ſculpture, and over the portal is a ſtatue of the holy Virgin. The three doors on this ſide of the church are bronze, with beautiful baſſo-relievos, repreſenting different hiſtories of the Old Teſtament. Over the middle door are theſe words "Domus Deiparæ, in quâ verbum Caro factum eſt." Keyſler's Travels, vol. iii. See Loretto.

Casa *Calanda*, in *Geography*, a town of Italy, in the kingdom of Naples, and country of Moliſe; 21 miles E.N.E. of Moliſe.

Casa *de la Contratacion*, or the houſe of trade, in *Commerce*, a tribunal of Spain eſtabliſhed at Seville, to the port of which the commerce of the New World was confined, as early as the year 1501, for the regulation of ſuch commercial affairs as required the immediate and perſonal inſpection of thoſe appointed to ſuperintend them. It may be conſidered both as a board of trade, and as a court of judicature. In the former capacity it takes cognizance of whatever relates to the intercourſe of Spain with America; regulates the commodities that ſhould be exported thither, and has the inſpection of thoſe that are received in return. It decides concerning the departure of the fleets for the Weſt Indies; the freight or burden of the ſhips, their equipment, and their deſtination. In the latter capacity it judges with reſpect to every queſtion, civil, commercial, and criminal, ariſing in conſequence of the tranſactions of Spain with America: and in both theſe departments, its deciſions are exempted from the review of any court but that of the *Council of the Indies*, which ſee.

Casa *Grand*, in *Geography*, a town of North America, in the country of New Mexico, and province of New Navarre, ſeated on a river N. of Buenaventura. N. lat. 29° 30′. W. long. 107° 20′.

Casa *Maſſima*, a town of Naples, in the country of Bari; 11 miles S.W. of Converſano.

Casa *Viíieri*, a town of Naples, in the country of Lavora; 7 miles S.E. of Sora.

CASAC, or Cazac, a country of Aſia, in the dominions of Perſia, on the frontiers of Armenia, governed by princes of its own, nominally ſubject to Perſia; about five leagues from north to ſouth, and ſomewhat more from eaſt to weſt. The inhabitants are deſcended from the Coſſacks, and are repreſented as a rude and barbarous people. Caſac, or Cazac Loré, is the name of the capital.

CASÆ, in *Ancient Geography*, a town of Aſia, ſituate on the mountains of Pamphylia. Ptolemy.

Casæ *Baſtalenſes*, or *Calanenſes*, an epiſcopal ſee of Africa, in Numidia.—C. *Calbinti*, a place of Africa, in Mauritania Cæſarienſis, between the colonies of Tipaſa and Icoſium, according to the Itinerary of Antonine.—C. *Favenſes*, an epiſcopal city of Africa; but the province in which it was ſituated is not aſcertained.—C. *Medianenſes*, an epiſcopal city of Africa, in Numidia.—C. *Nigræ*, an epiſcopal city of Numidia.—C. *Sylvanæ*, an epiſcopal city of Africa, in Byzacium.—C. *Villa Aniceorum*, a place of Africa, according to the Itinerary of Antonine, in the route from Carthage to Leptis, between Tacapæ and the colony of Sarbaras.

CASAL, in *Geography*, a town of Italy, and capital of Montferrat, ſeated on the Po, formerly well fortified, and defended by a citadel, which was much admired. It was taken from the Spaniards in 1640; ſold by the duke of Mantua to the king of France in 1681; taken in 1695 by the allies, who deſtroyed its fortifications; but retaken by the French and re fortified. The king of Sardinia became maſter of it in 1706; but it was taken by the French in 1745, retaken in 1746, and captured again by the French in 1796. The biſhop is ſuffragan to the archbiſhop of Milan. N. lat. 45° 7′. E. long. 8° 37′.

Casal-*Maggiora*, a town of Italy, in the duchy of Milan, and country of the Cremoneſe, ſeated near the Po, and made a town in 1754. N. lat. 45° 6′. E. long. 11° 5′.

CASALMACH. See Iris.

CASAL-NOVO, a conſiderable town of Naples, in the province of Terra di Otranto, containing about 4000 inhabitants, noted for nothing but their taſte for dog's fleſh. At this place, as well as at Lecce, the tanners kidnap dogs and tan their hides into an imitation of Turkey leather, with which they ſupply the gentlemen of the neighbouring cities, who are nice in their ſlippers. This demand for falſe Morocco occaſions the ſlaughter of many dogs, and, without doubt, the cuſtom of eating their fleſh commenced among the needy tanners. Hunger and experience have taught their countrymen to conſider the diſcovery as a very beneficial one. N. lat. 40° 42′. E. long. 17° 36′.—Alſo, a town of Naples, in the province of Principato Citra, N.E. of Policaſtro. N. lat. 40° 16′. E. long. 15° 34′.

CASALUS *Sinus*, in *Ancient Geography*, a gulf on the weſtern coaſt of the iſland of Corſica.

CASAMA, a town of Aſia, placed by Ptolemy in the Palmyrene territory, which was a country of Syria. The Notitia Imperii places it in Phœnicia. It was ſituated on a ſmall river to the eaſt of Carræ.

CASAMAN, a town of Aſia, probably towards Armenia.

CASAMARRI, a people placed by Pliny in Ethiopia, near Egypt.

CASAN, or Kazan, in *Geography*, a government of Ruſſia in Europe, ſeated on the river Volga; bounded on the north by that of Viatka, on the eaſt by the governments of Permia and Ufa, on the ſouth by that of Simbirſk, and on the weſt by that of Neſhnei Novogorod. It contains 13 diſtricts, of which one is Caſan, or Kazan, ſituate on the rivulet Caſanka, which falls into the Volga. Its capital bears the ſame name. The kingdom of Kazan was conquered from the Tartars by Joan Vaſſilievitch II. or Baſilowitz, after a conteſt of ſeven years; the capital of it ſurrendering to the victor in 1552; and at this time the empire of it was united to Ruſſia for ever. In the Turkiſh and Tartarian language, Kazan ſignifies a large cauldron, of ſufficient ſize to contain victuals for many perſons; and this name is given by the Crim or Budziah Murſes to the families of their ſubjects, or vaſſals, reckoning about 10 men to a kazan. The preſent Kazan Tartars are but a feeble remnant of what they once were, partly conſiſting of thoſe who remained in their old habitations, and partly of thoſe who ſettled as fugitives in other diſtricts of Ruſſia.

Casan, or Kazan, a city of Ruſſia, and the capital of the above government, ſituated near the Volga. This city was built in the year 1257, by a ſon of Baaty, a kinſman of the great Tchinghis; and its khanate aſſerted its independency about the year 1441, when the Krim disjoined itſelf from Kapiſchah, or Capſchac. Kazan conſiſts of a ſtrong fort, built with ſtone, the wooden town as it is called, and ſeveral adjoining ſuburbs, one of which is inhabited by Tartars. Here are ſeveral churches, moſt of which are conſtructed with ſtone, and alſo 11 convents in or near the town. The government chancery which is held in the fort, is under the direction of the governor and deputy governor. All the garriſons and regiments within the government of Kazan are under the command of the governor. The garriſon of the city conſiſts of three regiments, for the ſervice of which a good hoſpital is provided. Kazan is an archbiſhop's ſee. At one end of the town is a manufactory of cloth, which is purchaſed by government for the cloathing of the troops. In a convent, called Siliandowo, ſeated on the river Caſanka, about two werſts from the town, is a ſchool, where the children of Tartars are taught the Ruſſian and Latin languages, the principles of the Chriſtian religion, and the elements of philoſophy, in order to qualify them as preachers for the converſion of the nations to which they belong. In 1749, and again in 1752, this city was totally deſtroyed by fire. The adjoining country is fertile in all ſorts of fruits, corn, and pulſe. The commerce of this government conſiſts of furs, and of oak timber for the building of ſhips. For the preſervation of the large oak-trees that grow in this diſtrict czar Peter I. appointed foreſters, who had under them diſcharged ſoldiers; but theſe people committed every kind of exceſs among the inhabitants, and, therefore, they were aboliſhed in the year 1762. However, every land-owner is careful of his oaks, as they fetch at all times a good price. In Peterſburg every pood of oak timber, including the expence of tranſport, ſells for 15 to 25 kopeeks. Caſan or Kazan is diſtant 400 miles E. of Moſcow, and 660 S.E. of Peterſburg. N. lat. 55° 43′ 58″. E. long. 49° 8′ 15″.

CASANDRA, in *Ancient Geography*, an iſland placed by Pliny in the Perſian gulf over againſt Perſia Propria.

CASA-NOVA, Marc-Antonio, in *Biography*, called in his time, the prince of Latin epigrammatiſts, was born at Rome, where he flouriſhed in the beginning of the 16th century. Attaching himſelf to the imitation of Catullus and Martial, he affected the wit and ſeverity of the latter, but deviated from the nature and purity of the former. Whilſt he was engaged in the ſervice of the Colonna family, he exerciſed his ſatire againſt Clement VII. with ſo little moderation, that he was impriſoned and condemned to death, but pardoned by the pontiff. After the ſack of Rome he was reduced to ſuch extreme indigence, that he wandered about the ſtreets begging bread, and died either of want or of the plague in 1527. Beſides his epigrams, he wrote ſhort eulogies or inſcriptions on the principal characters of ancient Rome. A ſelection of his pieces may be found in the firſt volume of the "Deliciæ Poetar. Italor."

CASAPE, in *Ancient Geography*, a town of Aſia, placed by Ptolemy in the interior of Hircania.

CASAQUE, an ancient military habit conſiderably larger than an ordinary coat. It was formerly the common veſtment or garment of all the French. And as this caſaque was of a different colour in each company of their troops, it was eaſily and immediately diſcovered by this diſtinguiſhing difference, to what company any ſoldier belonged, who had been guilty of any diſorder, outrage, or irregularity. When the caſaque was aboliſhed, it was ſucceeded by the echarpe or ſcarf, which was alſo of different colours in different companies.

CASAS, De Las, Bartholomew, in *Biography*, a prelate eminently diſtinguiſhed by his humanity, was born at Seville in 1474, and in his 19th year accompanied his father, who ſailed to the Weſt Indies with Columbus. On his return to Spain after an abſence of five years, he purſued his ſtudies, and entered into the eccleſiaſtical order. When Columbus made a ſecond voyage to Hiſpaniola, Las Caſas was one of the clergymen who attended him thither, with a view of ſettling in that iſland. On the reduction of Cuba, he was obliged to take the rectory of Zaguarama in this iſland. Adopting the opinion which was prevalent at this time among the eccleſiaſtics, and particularly among the Dominicans, that it was unlawful to reduce the natives to ſervitude, he concurred with them in exclaiming againſt the "repartimientos," or diſtributions which were made of them by the governor as ſlaves to their conquerors. In order to demonſtrate the ſincerity of his conviction, he relinquiſhed his ſhare in the diſtribution, declaring that he ſhould ever bewail his own misfortune and guilt, in having exerciſed for a moment this impious dominion over his fellow creatures. From that time he became the avowed patron of the Indians, and by his active interpoſition in their favour contributed to reſtrain the exceſſes of his countrymen. Actuated by a laudable zeal in their cauſe, he ſet out for Spain in 1516, for the purpoſe of ſtating their diſtreſſed ſituation to king Ferdinand and intreating his compaſſion in their favour. This monarch, being in a declining ſtate of health, was much impreſſed by the eloquence of Las Caſas, and promiſed to adopt means for redreſſing the evil of which he complained and the guilt of which he forcibly charged on Ferdinand himſelf. Death, however, prevented him from executing his reſolution. Las Caſas, with unabated ardour, determined to lay their caſe before Charles of Auſtria, who was then in the Low Countries, but whilſt he was preparing to ſet out for Flanders, the regent, Cardinal Ximenes, with the vigour peculiar to his character, adopted a plan for accompliſhing the object which the benevolent eccleſiaſtic had in view; and accordingly he reſolved to ſend out three reſpectable commiſſioners, with ample powers to examine all circumſtances upon the ſpot, and to decide finally with reſpect to the point in queſtion. As the Dominicans and Franciſcans had already eſpouſed oppoſite opinions in this controverſy, he excluded both theſe fraternities from the commiſſion, and reſtricted his choice to the monks of St. Jerome. Having ſelected three perſons, whom he deemed equal to the charge, and joined to them a private lawyer of diſtinguiſhed probity, Las Caſas was appointed to accompany them, with the title of "Protector of the Indians." Upon their arrival at St. Domingo, they began to execute their commiſſion by liberating all the Indians, who had been granted to the Spaniſh courtiers, or to any perſon not reſiding in America. This meaſure excited a general alarm; but the fathers of St. Jerome proceeded with prudence and caution; and finding it neceſſary to tolerate the "repartimientos," they uſed their utmoſt endeavours to prevent the injurious effects of this eſtabliſhment, and to ſecure to the Indians the beſt treatment that was compatible with their ſtate of ſervitude. For this purpoſe they enacted ſeveral uſeful regulations. Las Caſas, however, was diſſatisfied, and remonſtrated againſt that unhallowed timid policy, which led them to accommodate their conduct to the ſtate of the colony, and to tolerate what was unjuſt, becauſe it was beneficial. The commiſſioners adhered to their ſyſtem; and Las Caſas, in order to avoid the effects of the reſentment which he had excited among the Spaniſh planters, was under a neceſſity of ſeeking an aſylum in a convent. Perceiving that all his efforts in America were fruitleſs, he ſoon ſet out for Europe, with a fixed purpoſe not to abandon the protection of a people whom he deemed to be cruelly oppreſſed. Upon his arrival, he found Ximenes dying; and ſoon after Charles V. took poſſeſſion of the Spaniſh government, which he chiefly committed to his Flemiſh miniſters. Las Caſas intereſted them in his cauſe, and induced them to recal the fathers of St. Jerome, and to appoint a chief judge to re-examine the points of controverſy between the friends of Indian liberty, and the coloniſts. Whilſt Las Caſas was thus zealouſly promoting a ſcheme, ſuggeſted by humanity and a liberal policy, for the emancipation of Indian ſlaves, he was betrayed by the ardour with which he proſecuted his purpoſes into the inconſiſtency of extending the miſeries of ſervitude to the inhabitants of Africa. Accordingly,

cordingly, in order to furniſh the Spaniſh planters with labourers, inſtead of thoſe Indians whom he wiſhed to emancipate, he propoſed to purchaſe a ſufficient number of negroes from the Portugueſe ſettlements on the coaſt of Africa, and to tranſport them to America, that they might be employed as ſlaves in working the mines, and cultivating the ground. Thus, while he contended earneſtly for the liberty of the people born in one quarter of the globe, he laboured to enſlave the inhabitants of another region; and in the warmth of his zeal to ſave the Americans from the yoke, pronounced it to be lawful and expedient to impoſe one ſtill heavier upon the Africans. Unfortunately for the latter, Las Caſas's plan was adopted. Charles V. granted a patent to one of his Flemiſh favourites, containing an excluſive right of importing 4000 negroes into America. He ſold his patent to ſome Genoeſe merchants for 25,000 ducats, and they were the firſt who brought into a regular form that execrable commerce for ſlaves between Africa and America, which has ſince been carried to ſuch an amazing extent. Las Caſas, however, connected with his very cenſurable plan of enſlaving Africans the much leſs exceptionable project of ſupplying the new ſettlements in Hiſpaniola and the other iſlands with a ſufficient number of labourers and huſbandmen, who ſhould be allowed by ſuitable premiums to remove thither. This ſcheme was countenanced by the Flemiſh miniſters, but defeated by the biſhop of Burgos, who thwarted all the projects of Las Caſas. Las Caſas, deſpairing of procuring any relief for the Indians in thoſe places where the Spaniards were already ſettled, formed an idea of eſtabliſhing a new colony; and with this view, he applied for a grant of the unoccupied country, ſtretching along the ſea-coaſt from the gulf of Paria to the weſtern frontier of that province now known by the name of Santa Martha. He propoſed to ſettle there with a colony compoſed of huſbandmen, labourers, and eccleſiaſtics. He engaged, in the ſpace of two years, to civilize 10,000 of the natives, and to inſtruct them ſo thoroughly in the arts of ſocial life, that, from the fruits of their induſtry, an annual revenue of 15,000 ducats ſhould ariſe to the king; and in 10 years he expected that his improvement would be ſo far advanced as to yield annually 60,000 ducats. In forming this ſcheme Las Caſas had evidently conceived ideas concerning the method of treating the Indians, ſimilar to thoſe by which the Jeſuits afterwards carried on their great operations in another part of the ſame continent. After encountering much oppoſition from the biſhop of Burgos and the council of the Indies, he at length obtained a territory of 300 miles along the coaſt of Cumana, with liberty to extend it as far as he pleaſed towards the interior part of the country. However, with all his efforts, he could not prevail on more than 200 perſons to accompany him, with whom he failed, in 1521. Several of theſe died or left him at Porto Rico, where he firſt landed; and with the few that adhered to him, he proceeded to Cumana, which he found much diſtreſſed on account of a recent invaſion of the Spaniards. He was therefore under a neceſſity of repairing to Hiſpaniola in order to ſolicit ſuccours; but during his abſence, the natives, exaſperated by the injuries they had ſuffered, attacked the enfeebled coloniſts, deſtroyed many of them, and obliged the reſt to take refuge in the iſland of Cubagua. Soon after this iſland was abandoned, and not a Spaniard remained in any part of the continent, or adjacent iſlands, from the gulf of Paria to the borders of Darien. Las Caſas, aſhamed to ſhew himſelf after ſuch a ſucceſſion of diſaſters, and after this fatal termination of all his ſplendid ſchemes, ſhut himſelf up in the convent of the Dominicans at St. Domingo, where he aſſumed the habit of the order and devoted himſelf to the performance of religious duties. Fruſtrated in all his projects for the benefit of the oppreſſed Indians, he nevertheleſs not only retained his former anxiety and zeal for their relief, but an increaſed knowledge of their ſufferings had augmented its ardour. In 1542, he was ſent by a chapter of his order at Chiapa to Madrid, and he took this occaſion of pleading their cauſe before Charles V. and inculcating his favourite maxims concerning the proper mode of treating them. Not confiding for ſucceſs in the powers of his oratory alone, he enforced them by compoſing his famous treatiſe entitled "Brieve Relation de la Deſtruction des Indes," in which he related, with many horrid circumſtances, probably exaggerated by his powers of deſcription, the devaſtation of every province, which had been viſited by the Spaniards. This treatiſe excited throughout Europe a deteſtation of the cruelties practiſed by the Spaniards in America; and Las Caſas ſo far ſucceeded with the Spaniſh court, as to induce them to adopt ſeveral new regulations which he propoſed, and which contributed in a conſiderable degree to alleviate the ſufferings of the oppreſſed natives. With a view to their further relief and protection he accepted the dignity of biſhop of Chiapa, and returned thither in 1544. Having continued in his ſee till the year 1551, he left it on account of his declining health, reſigned his biſhopric into the hands of the pope, and retired to Madrid, where he finiſhed his courſe of active and indefatigable benevolence in 1566, at the advanced age of 92 years. Beſides his work on the deſtruction of the Indians, he wrote a Latin treatiſe on the queſtion, "Whether ſovereigns may in conſcience, by virtue of any right, alienate their ſubjects from their crown, and transfer them to the dominion of any other lord?" Tubing. 1625, 4to. In this treatiſe he diſcuſſes, with ſingular freedom, many points of a delicate nature reſpecting the rights of ſovereigns and people. He alſo compoſed many other works, which have never been publiſhed, among which is "A General Hiſtory of the Indies," of which Antonio de Herrera is ſaid to have availed himſelf in the compilation of his hiſtory. Moreri. Robertſon's Hiſt. of America, vol. i. and vol. iii.

CASASA, or Caçaça, in *Geography*, a ſea-port town of Africa, in the kingdom of Fez, at the mouth of a large river in the Mediterranean; 18 miles S. of Melilla. N. lat. 35° 8′. E. long. 32° 41′.

CASATI, Paul, in *Biography*, a learned Jeſuit, was born at Placentia in 1617, and became a profeſſor of mathematics and theology at Rome. He was one of the two Jeſuits who attended Chriſtina queen of Sweden at her requeſt, and proſelyted her to the Roman Catholic religion. Upon his return to Italy, in 1652, he was ſuperior over ſeveral houſes of his order, and occupied the firſt dignity in the univerſity of Parma for two years; in which city he died in 1707. He compoſed the following works: "Vacuum proſcriptum;" "Terra machinis mota;" "Fabrica et uſo del compaſſo di proportione;" "Mechanicorum libri viii; "De Igne;" "Hydroſtaticæ diſſertationes;" "Opticæ diſputationes," written at 88 years of age, after he was blind: "Problemata ab anon. geom. Ludg. Batav. propoſita, a Paulo Caſato explicata."

CASAUBON, Isaac, an eminently learned critic and commentator, was born in 1559, at Geneva, whither his father retired to eſcape perſecution, and received his early education at Creſt in Dauphiné, under his father, where he was ſettled as miniſter, when the perſecution ceaſed. So rapid was his proficiency, that, at the age of nine years, he was able to ſpeak and write Latin with fluency and correctneſs. But, on account of his father's frequent abſence, he ſo far loſt the ground which he had gained, that, at the age of 12 years, he was obliged to recommence his ſtudies. In 1578, he was ſent to Geneva, where he made ſuch progreſs in the Greek tongue under Francis Portus of the iſle of Candy, the Greek profeſſor, that, in 1582, he was appointed to ſucceed him. At the age of 25 years he publiſhed his notes on "Diogenes Laertius," which were added, in 1594, to the 8vo. edition of Henry Stephens. His "Lectures on Theocritus," were publiſhed at Geneva in 1584, 12mo. and dedicated to H. Stephens, whoſe daughter he married in 1586, by whom he had 20 children. Theſe notes were likewiſe publiſhed under the aſſumed name of "Hortibonus," ſynonymous with Caſaubonus, becauſe *Caſau*, in Dauphiné, means a garden; which he preferred to his own as more ſuitable to a Latin book. In 1587, he publiſhed his "Strabo" at Geneva," fol.; and in the ſame year his edition of the New Teſtament with notes, afterwards inſerted in the "Critici Sacri." Having ſtudied philoſophy and civil law under Julius Pacius, he alſo applied to the oriental languages and Rabbins. His notes on "Dionyſius Halicarnaſſenſis," were publiſhed at Geneva, in 1588, fol.; and his "Polyænus's Stratagemata," at Lyons, in 1589, 16mo. His "Ariſtotle," in Greek and Latin, was printed at Lyons, in 1590, and reprinted at Geneva, in 1605, fol.; and in the following year he publiſhed an edition of "Pliny's Letters," with notes, and the ancient "Panegyrics," Genev. 12mo. His "Theophraſtus's Characters," 12mo. was publiſhed at Lyons, in 1592, with a Latin verſion and commentary, and a third more correct edition appeared at Lyons, in 1612, 12mo. His "Apuleius's Apology," appeared in 1594, 4to. dedicated to Joſeph Scaliger; and his "Commentary on Suetonius," was printed at Geneva, in 1596, 4to. and another enlarged and corrected edition was printed at Paris, in 1610, fol. Diſſatisfied with his ſituation at Geneva, he removed to Montpellier, in 1596, and accepted the office of profeſſor of the Greek and of polite literature; but here he was ſo much diſappointed in his expectations of encouragement and ſupport, that he thought of returning again to Geneva. However, in 1598, he removed to Lyons, with the view of printing his edition of "Athenæus's Deipnoſophiſtæ," which was publiſhed in 1600, and again in 1612, in 2 vols. fol.; and in the mean while he accompanied M. du Vicq to Paris, where he was introduced to king Henry IV. and whoſe invitation to the office of profeſſor of polite learning he accepted, in 1599. But jealouſy, on the part of the other profeſſors, and his own adherence to the Proteſtant religion, rendered this office untenable. In 1600, he was one of the judges on the ſide of the Proteſtants at the conference held at Fontainbleau, between Cardinal du Perron and du Pleſſis-Mornay, and by his conduct on this occaſion he led ſome perſons to expect that he would become a convert to popery; but though he was no zealot in religion, he invariably declined complying with the ſolicitations of his Roman Catholic friends, who wiſhed him to change his profeſſion. The king, who had conferred upon him a penſion, promiſed him alſo the reverſion of the poſt of his librarian, which office he obtained in 1603, together with an increaſe of his penſion. At this time he publiſhed ſeveral works of the ancients, viz. "Hiſtoriæ Auguſtæ Scriptores cum Commentario," Paris, 1603, 4to.; "Diatriba ad D. Chryſoſtomi Orationes," publiſhed in Morel's edition of that author at Paris, 1604, fol; "Perſii Satyræ ex recenſione et cum Commentariis I. Caſauboni," Paris, 1605, 8vo., and London, 1647, 8vo. of which Joſeph Scaliger ſays, that in this edition "the ſauce is worth more than the fiſh;" "De Satyricâ Græcorum Poeſi, et Romanorum Satyrâ, lib. ii." Paris, 1605, 8vo.; in which work he maintains that the ſatyrical poetry of the Latins was very different from that of the Greeks; an opinion which was attacked by Daniel Heinſius, and vindicated by Ezekiel Spanheim: and "G. Nyſſeni Epiſtola ad Euſtathiam, Ambroſiam, et Baſiliſſam, Gr. et Lat. cum notis I. Caſauboni," Paris, 1606, 8vo. and Hanaw, 1611, 8vo.; which letter was firſt publiſhed by him. In 1607, he compoſed his treatiſe "De Libertate Eccleſiaſticâ," 8vo.; which was occaſioned by the diſputes that had occurred between pope Paul V. and the republic of Venice, and contains a vindication of the rights of ſovereigns againſt the pretenſions of Rome; but theſe diſputes being adjuſted whilſt the work was printing, it was ſuppreſſed by order of king Henry IV. His edition of "Polybius," to which is annexed "Æneas Tacticus de tolerandâ obſidione, Gr. et Lat." was publiſhed at Paris in 1609, fol. His Latin verſion of both theſe authors was much approved; and the dedication to Henry IV. is reckoned among the maſterpieces of modern Latin compoſition. The beſt edition of his letters "If. Caſauboni Epiſtolæ, &c." containing alſo his prefaces, dedications, poems, &c. with thoſe of his ſon Meric, is that by Almeloveen, Rotterdam, 1709, fol. In conſequence of ſeveral conferences which he held with cardinal du Perron on the ſubject of religion, a report was ſpread that he had promiſed to abandon the Proteſtant faith, which he thought it neceſſary publicly to contradict: and his uniform adherence to his profeſſion ſufficiently refutes the charge of indifference to religious doctrines, which has been alleged againſt him. Although he was perſevering in his attachment to his own profeſſion, he avoided controverſy, and in his opinion, with regard to thoſe who differed from him, he was liberal and tolerant. When one of his ſons became a capuchin, and afterwards ſought his bleſſing, "I give it you," ſays he, "with all my heart; I do not condemn you, neither do you condemn me: we ſhall both appear at the tribunal of Chriſt." As a farther evidence of the liberality of his ſentiments, and love of peace, it is alleged, that he was one of thoſe who thought an union between the Papiſts and Proteſtants to be both practicable and deſirable; and in this opinion he concurred with the learned Grotius and many others of the age in which he lived. His attachment to his own profeſſion, notwithſtanding his liberality, was evinced by the uneaſineſs he felt on occaſion of his eldeſt ſon's becoming a proſelyte to the Catholic religion. After the death of Henry IV., an event which he much lamented, he determined to comply with the repeated invitation of James I. to viſit England; and, accordingly, in 1610, he accompanied ſir Henry Wotton hither, and was received with great civility by the king and many other perſons of learning and diſtinction. Upon his arrival, he was made a denizen, liberally penſioned, and preſented to a prebend at Weſtminſter and another at Canterbury. In return for theſe favours he was engaged by the king, much againſt his own inclination, in controverſial writings againſt the Papiſts. Accordingly, his confutation of Baronius's Annals, or "Exercitationes contra Baronium," was publiſhed at London, in 1614, fol. at Franckfort, in 1615, 4to., and at Geneva in 1655 and 1663, 4to. He did not live long after the completion of this work; for he died of a ſingular and painful diſeaſe of the bladder, of which ſir Theodore Mayerne has given a particular account in his medical writings, in 1614, in the 55th year of his age. He was interred in Weſtminſter Abbey, and a handſome monument was erected to his memory by Thomas Morton, biſhop of Durham. The laudatory epitaph, inſcribed upon it, cloſes with theſe lines:

"Qui noſſe vult Caſaubonum,
Non ſaxa, ſed chartas legat,
Superfuturas marmori,
Et profuturas poſteris."

Caſaubon's character was that of a modeſt, candid, upright man, though ſomewhat reſtleſs and querulous in his temper. As a critic, he is always ranked among the firſt, and his numerous publications, the principal of which we have recounted, afford ſufficient evidence of his indefatigable induſtry and extenſive erudition. Gen. Dict. Biog. Brit.

Casaubon, Meric, ſon of Iſaac, the ſubject of the preceding article, was born at Geneva in 1599, and, accompanying his father to England, in 1610, finiſhed his education at Chriſt-church college, Oxford, where he took the degree of M. A. in 1621, and acquired the reputation of extenſive learning. At the age of 22, he publiſhed a book, vindicating his father againſt the calumnies of the Roman Catholics, and entitled "Pietas contra maledicos Patrii Nominis et Religionis Hoſtes," 8vo. This was followed, three years after, viz. in 1624, by a ſecond vindication of his father, "Vindicatio Patris adverſus Impoſtores, &c." written by command of king James I. and occaſioned by a publication of the ſame year, entitled, "The Original of Idolatries, or the Birth of Hereſies, &c." falſely aſcribed to I. Caſaubon. About this time he was promoted to the rectory of Bledon in Somerſetſhire; and, in 1628, by the intereſt and recommendation of biſhop Laud, he was made prebendary of Canterbury. This prelate, upon his own advancement to the ſee of Canterbury, gave Caſaubon two vicarages in the iſle of Thanet, and, in 1636, he was created doctor in divinity by mandate of king Charles I.; but, during the heat of the civil wars, about the year 1644, he was deprived of his preferments, fined, impriſoned, and reduced to extreme indigence. In theſe circumſtances he declined accepting ſome advantageous offers that were made him in 1649, on condition of his undertaking to write the hiſtory of the late war; and he alſo rejected an invitation that was conveyed to him ſoon after by the Swediſh ambaſſador from queen Chriſtina, to ſuperintend the univerſities in her kingdom. On the reſtoration he recovered his preferments, and, in 1662, exchanged one of his vicarages for the rectory of Ickham near Canterbury. He died in 1671, and was buried in the cathedral of that city. His literary character was that of a general ſcholar, but by the aid of his father's rules and papers more ſkilled in criticiſm than in any other department of literature. In private life he was diſtinguiſhed by his piety and charity, and by the courteouſneſs of his diſpoſition and manners. Of his publications the principal are as follow: viz. "Optati Libri VII. de Schiſmate Donatiſtarum," 1632, 8vo.; "A Treatiſe of Uſe and Cuſtom," Lond. 1638, 8vo.; "The Uſe of Daily public Prayers in three Poſitions," Lond. 1641, 4to.; "Marci Antonini Imperat. de ſeipſo et ad ſeipſum, &c. with Xylander's Verſion, &c. Gr. & Lat." Lond. 1643, 8vo.; alſo, "An Engliſh Tranſlation of this Work, with Notes, &c." 1634; "De Verborum Uſu, et accuratæ eorum Cognitionis Utilitate Diatriba," Lond. 1647, 8vo.; "De quatuor Linguis Commentationis, Pars I." comprehending the Hebrew and Saxon, but left incomplete as to the Greek and Latin; Lond. 1650, 8vo.; "Terentius, cum Notis T. Farnabii in quatuor priores comœdias, et M. Caſaub. in Phormionem et Hecyram," Lond. 1651, 12mo.; "Some Annotations on the Pſalms and Proverbs," inſerted in one of the latter editions of the "Aſſembly's Annotations on the Bible;" "In Hieroclis Commentarium de Providentia et Fato, Notæ et Emendationes," Lond. 1655, 8vo. and 1673, 8vo.; "A Treatiſe concerning Enthuſiaſm, as it is an effect of Nature, but is miſtaken by many for either Divine Inſpiration, or Diabolical Poſſeſſion," Lond. 1655, 8vo.; a work highly commended by ſir William Temple, as a happy attempt to account for deluſions upon natural principles, though it has been obſerved, that the author was too much inclined to credulity and ſuperſtition to diſcuſs this ſubject philoſophically, which appears from his "True and faithful relation of what paſſed for many years between Dr. John Dee and ſome Spirits," in the preface to which he attempts to confirm what is ſaid in that relation concerning ſpirits, Lond. 1659, fol.; and alſo in his work "Of Credulity and Incredulity in Things Natural, Civil, and Divine; wherein the Sadduciſm of theſe Times in denying Spirits, Witches, and ſupernatural Operations, is fully confuted," &c. Lond. 1668, 8vo. 1670, 8vo. 1672; "De Nupera Homeri Editione Lugduno-Batavica Hackiana, &c." Lond. 1659, 8vo. reprinted in Almeloveen's edition of Caſaubon's letters; "Epicteti Enchiridion et Cebetis Tabula, Gr. & Lat." Lond. 1659, 8vo.; "An Engliſh Tranſlation of Lucius Florus's Hiſtory of the Romans, with Notes," Lond. 1659, 8vo.; "A Vindication of the Lord's Prayer, &c." Lond. 1660; "Notæ et Emendationes in Diogenem Laertium, &c." annexed to the editions of Laertius, printed in Lond. 1664, fol. and Amſt. 1692, 4to.; "Of the Neceſſity of Reformation in and before Luther's Time, &c." Lond. 1664, 4to.; "Notæ in Polybium," firſt printed in Gronovius's edition, Amſt. 1670, 8vo.; and "Epiſtolæ, Dedicationes, &c." annexed to I. Caſaubon's letters by Almeloveen. Beſides the works above recited, M. Caſaubon wrote ſeveral other pieces, learned, controverſial, &c. which it is needleſs to enumerate. He alſo left, by will, a great number of MSS. to the univerſity of Oxford. His Engliſh ſtyle is harſh and perplexed, and much intermixed, according to the cuſtom of the time, with Greek and Latin. Gen. Dict. Biog. Brit.

CASAVOLI, in *Geography*, a town of Naples, in the province of Bari; 14 miles S.W. of Monopoli.

CASBA, a town of Africa, in the kingdom of Tunis, which was once a Roman colony, is ſituated on a large, fertile plain, about 25 or 30 miles S. of Tunis. The walls of this town are ſtill ſtanding, though it has been almoſt deſtitute of inhabitants ever ſince it was deſtroyed by the Turks.

CASBIA, in *Ancient Geography*, a town of Aſia Minor, in Lycaonia. Ptolemy.

CASBIN, in *Geography*, a city of Perſia, in the province of Irak Agemi, is ſituated in an extenſive pleaſant plain, about 3 leagues from the noted mountains of Aluvend or Elwend. It was formerly a very conſiderable city, being about ſix miles in circumference, and containing 12,000 houſes, occupied by 100,000 inhabitants; but it has been ſo reduced by the civil wars of the country, that, in Hanway's time, its number of houſes did not exceed 1100. Its beautiful palaces are now in ruins, its walls are deſtroyed, and it has neither garriſon nor forts to defend it. The Hippodrome, or Royal Piazza, was 700 paces long, and 250 broad. Its ſituation for commerce is, in many reſpects, advantageous, as it lies open to Georgia, Adirbeitzan, and the Caſpian ſea. Its adjacent territory produces excellent grapes, ſome of which yield a ſtrong wine, and others are dried, and ſent with other fruits to all the provinces of the country. In its vicinity are found yellow orpiment and copper ore. In the 16th century Shah Tahmas, unable to defend Tauriz againſt the Turks, retired to Caſbin, which he eſtabliſhed as the capital city of his empire; but Abas the Great transferred this dignity to Iſpahan. The European geographers aſſert that Caſbin is the ancient Arſaria; but the Perſian hiſtorians will not allow it to be ſo ancient. N. lat. 36° 33′. E. long. 49° 33′.

CASBUONA, a town of Naples, in the province of Calabria Citra; 5 miles W. of Strongoli.

CASCABLE, the hindermoſt part of the breech of a cannon from the baſe-ring to the end or extremity of the knob or button. See Cannon.

CASCADE, a ſteep fall of water, from a higher into a lower place.

The word is French, formed of the Italian *caſcata*, which ſignifies the ſame; of *caſcare, to fall*; and that from the Latin *cadere*.

Caſcades are either natural, as that of Tivoli, &c. or artificial, as thoſe of Verſailles, &c. and either falling with a gentle deſcent, as thoſe of the Sceaux; in form of a buffet, as at Trianon; or down ſteps, in form of a perron, as at St. Clou; or from baſon to baſon, &c.

A natural caſcade, falling with a great noiſe, is more properly called a *cataract*, which ſee.

In a military ſenſe *caſcade* ſignifies, in hollowing out, or digging galleries or mines, a ſinking down into the earth by a ſort of ſtep below the common level, or a riſing above the ſame in like manner. When a miner rather ſinks deeper into the ground or riſes up higher by means of ſuch ſteps at different diſtances, or turns, he is ſaid to proceed by caſcades, or to *cheminer par caſcades*.

Cascade of *fire*. See Pyrotechny.

Cascade *point*, in *Geography*, a cape on the weſtern coaſt of New Zealand, in the South Pacific ocean. S. lat. 44° 5′. E. long. 189° 4′.

CASCAES, a ſea-port town of Portugal, on the N. ſide of the mouth of the Tagus, ſituate on a ſlip of land under which ſhips may lie; 5 leagues W. of Liſbon. N. lat. 38° 44′. W. long. 9° 33′. *Cape Caſcaes* lies 2½ miles S.W. of the town.

CASCANS, in French *caſcanes*, holes ſunk in the ground in the form of pits or wells, near the ramparts, from which galleries are carried under ground, either to mines of your own, or to give vent to thoſe of the enemy. Caſcans alſo denote a kind of cellars made under the capitals of a fortification.

CASCANTE, in *Geography*, a ſmall town of Spain in Navarre; 2 leagues from Tudella. Its ancient name was Caſcantum, and it was a municipal town. Ptolemy attributes it to the Vaſconi. It was ſituated near the Iberus; S.E. of Calaguris.

CASCARILLA, in *Botany*. See Croton *caſcarilla*.

Cascarilla, in the *Materia Medica*, is placed by Dr. Cullen in the claſs of tonics. It approaches, he ſays, to the aromatics by its eſſential oil; but its bitter, to be extracted either by water or ſpirit, is its moſt conſiderable part. It was introduced in the 17th century as a medicine of great value, both in continued and intermittent fevers; and the Italians, fond of any thing as a ſubſtitute for the Peruvian bark, againſt which they had declaimed, employed the caſcarilla in their practice and adduced many teſtimonies of its efficacy: but theſe teſtimonies have not been ſupported by ſucceeding practitioners, and in this country particularly it has been found a weak ſubſtitute for the Peruvian bark. In ſeveral trials it has entirely failed. Bergius, though he atteſts its inefficacy in fevers, recommends it in hæmoptyſis. But Dr. Cullen obſerves, that in hæmorrhages of all kinds it ſeems to be rather hurtful, as might be inferred from its aromatic and bitter qualities, while it does not in any inſtance manifeſt an aſtringent power. Its tonic and ſtomachic power may be allowed; but in theſe reſpects its virtues are not peculiar nor conſiderable: nor is there any juſt foundation for the prejudices which the German phyſicians have conceived in its favour. Cullen, Mat. Med. vol. II. p. 89. It has, however, maintained its place in our Pharmacopeias. The *extract of Caſcarilla*, prepared in the ſame manner with that of Cinchona (which ſee), has been lately introduced into the London Diſpenſatory, as a medicine of conſiderable uſe, and ſerving as a tonic in dyſpepſy, debility of bowels, and in ſome circumſtances of epidemic fevers. It may be given from 10 to 20 grains, two or three times a day. The *tincture* of caſcarilla, prepared by digeſting four ounces of powdered caſcarilla in two pints of proof ſpirit of wine with a gentle heat for eight days, and ſtraining it, is given in debility of the ſtomach and bowels, and may be ſubſtituted in ſome caſes for the tincture of cinchona.

CASCE, Casica, or Casice, in *Ancient Geography*, a town of Aſia in Aria. Ptolemy.

CASCHARA, a town of Aſia, in Meſopotamia, garriſoned by the Romans to guard their frontiers.

CASCHAU, Cassovia, Kassa, or Kossice, in *Geography*, the capital of Upper Hungary, a royal free town ſeated on the river Hernath, or Hundert, ſurrounded with a triple wall, a moat, and a bulwark, and furniſhed with a good arſenal. It is a well built place and the ſeat of a tribunal. The wine, beer, and ale of this town are very bad. In 1400 it was beſieged in vain by the Poles. In 1535, king John took it by ſtratagem, and in 1556, it was deſtroyed by fire. In 1604, its large and beautiful pariſh church was taken from the Lutherans, upon which, and in conſequence of other oppreſſive meaſures, the Caſchians were ſo incenſed that they took part with Stephen Botſkay, who died here in 1606. In 1616, it ſurrendered to Bethlem Gabor; in 1644, to George Rakotzy; in 1681 to Tokoly; and in 1685, to the Imperialiſts. Its univerſity was ſuppreſſed in 1782. It is diſtant 100 miles S. from Cracow, and 124 N.W. from Clauſenburg.

CASCHIVE, (Mormyrus Caſchive), in *Ichthyology*, the name under which Haſſelquiſt deſcribes the Linnæan Mormyrus *anguilloides*, which ſee.

CASCHOU, in *Botany*, Merian, Surin. See Anacardium *occidentale*.

CASCO-Bay, in *Geography*, a bay of North America, in the diſtrict of Maine, which ſpreads N.W. between Cape Elizabeth on the S.W. and Cape Small point on the N.E. Within theſe points, which are about 40 miles apart, are about 300 ſmall iſlands, ſome of which are inhabited, and almoſt all more or leſs cultivated. The land in theſe iſlands, and on the oppoſite coaſt on the main, is the beſt for agriculture on the ſea-coaſt of this country. Caſco includes ſeveral bays. *Maquoit* bay lies about 20 miles N. of Cape Elizabeth. On the E. ſide of this cape is the arm of the ſea called *Stroud-water*. Farther to the E. is *Preſumpſcot* river, formerly called Preſumpca, or Preſumpkeag, which riſes in Sebago pond. This river opens to the waters of Caſco-bay on the E. of Portland, and upon it are ſeveral valuable mills. *Rayal's* river, called by the natives Weſtecuſtego, falls into the bay ſix miles from Preſumpſcot river. It has a good harbour at its mouth for ſmall veſſels; and has upon it ſeveral mills; but two miles higher a fall obſtructs the navigation. Between it and Kennebeck there are no rivers: ſome creeks and harbours of Caſco-bay extend into the main land, affording harbours for ſmall veſſels, and interſecting the country in various forms. N. lat. 43° 40′. W. long. 70° 10′.

CASCUMPAC *Harbour* lies on the North coaſt of the iſland of St. John in North America. N. lat. 46° 45′. W. long. 63° 55′.

**CASE**, ſometimes denotes a veſſel or receptacle in form of a tomb, commonly decorated with gold and ſilver, wherein the body of a ſaint, or ſome relics of it, are preſerved.

In which ſenſe, the word is formed from the French *chaſſe*. Originally theſe caſes were made in the figure of little Gothic churches, purſuant to that ancient Chriſtian maxim, that the ſaints, having been the living temple of the Holy Ghoſt, are entitled, after their death, to have their bones encloſed in the figure of the viſible houſe of God.

The caſe of St. Genevieve is never brought down without great ceremony, nor except in time of extreme public dangers or calamities.

**Case, John**, M. D. in *Biography*, was born at Woodſtock, where he received the rudiments of his education. In 1564, he was elected ſcholar, and in ſucceſſion, maſter of arts, and one of the fellows of St. John's college, Oxford. Wood celebrates him for his ſkill in diſputation, in which he is ſaid to have excelled all his cotemporaries. Marrying ſome time after, he was permitted by the chancellor to read lectures to the ſtudents, in logic and philoſophy. He alſo wrote, for the uſe of his pupils, ſhort treatiſes on Ariſtotle's organon, ethics, politics, œconomics, and phyſics. One of them, "Sphæra Civitatis ſive de Politia," printed in 4to. in 1588 by Barnes, having been pirated on the continent, and copies coming over, Barnes obtained an order, obliging every ſcholar in the univerſity to take one of his books. In 1589, he was made doctor in medicine, and the ſame year, prebendary of North Aulton, in the church of Sarum. He was much reſpected, both as a phyſician, and teacher, and acquired, Wood ſays, a handſome fortune, the greater part of which he left at his death, (which happened on the 23d of January 1599), to charitable uſes. He was buried in the chapel of St. John's college, where a handſome monument was erected to his memory. Wood gives a catalogue of his productions, which are now little noticed. Athænæ Oxon.

**Case, John**, M. D. Granger gives an account of this man. He was a noted aſtrologer in the time of queen Anne, and ſucceeded Lilly, who left him poſſeſſed of his apparatus, particularly his darkened chamber, and pictures, with which he pretended to ſhew his cuſtomers their abſent friends. Caſe uſed to exhibit theſe to his intimates, in the hours of conviviality, laughing at the folly, and credulity of the people. Over his door was written,

Within this place
Lives Dr. Caſe;

by which diſtich he probably got more than Dryden did by all his works. Haller alſo mentions a doctor John Caſe who publiſhed in 1694, "Compendium Anatomicum, nova methodo inſtructum," 12mo. in which the writer ſtrenuouſly defends the opinion of De Graaf, that quadrupeds, and all other animals, as well as birds, proceed ab ovo.

**Case**, or *Caſos*, in *Ancient Geography*, a ſmall iſland ſituate S.W. of Carpathos, and N.E. of the iſle of Crete.

**Case**, in *Grammar*, is underſtood of the different inflexions or terminations of nouns; ſerving to expreſs the different ſtates or relations they bear to each other, and to the things they repreſent. For the reaſon of the name, ſee Declension.

There is a great diverſity among grammarians, with regard to the nature and number of caſes: they generally find ſix caſes even in moſt of the modern languages, which they call the *Nominative*, *Genitive*, *Dative*, *Accuſative*, *Vocative*, and *Ablative*: but this ſeems only in compliance with their own ideas, which are formed on the Greek or Latin, and which they transfer to other languages.

The truth is, if by caſe be only meant an occaſional change in the termination of the noun, or name, which ſeems to be the juſt idea of caſe; there will, in this ſenſe, be juſt as many caſes as there are different terminations of nouns in the ſame number, i. e. in ſome languages more, in others leſs, and in others none at all.

Indeed, the generality of authors either have not any preciſe notion of caſes at all, or they wander ſtrangely from that notion: for they always reckon five caſes of nouns in the Greek, and ſix in the Latin: though ſeveral of theſe caſes be frequently alike, as the genitive and dative ſingular of the firſt declenſion of the Latin; the dative and ablative plural of the ſecond, &c. the genitive and dative dual of the Greek, &c. So that with theſe authors the termination is not the ſole criterion of the caſe.

It ſeems, however, much more agreeable to the principles of grammar, which only conſiders words materially, to make as many different caſes, as there are changes in the terminations of a name; which would free the Engliſh, and other modern tongues, from the embarraſſment of caſes; moſt of them expreſſing the various relations, not by changes in termination, as the ancients; but by the ſituation of the ſubſtantive, as in the nominative and accuſative caſes, or by the appoſition of articles and prepoſitions. On this footing it is certainly wrong to ſay, v. g. that *of a father*, is the genitive caſe of father; and *to a father*, the dative; for *of* and *to* are no part of the noun *father*; they are no cloſes or terminations, but articles or modificatives, which ſhew the different relation of the word *father*. And the ſame may be ſaid of the caſes of nouns, in the French, Italian, Spaniſh, Portugueſe tongues, &c. Nevertheleſs, the relation of poſſeſſion, which anſwers to the genitive caſe, is often expreſſed by a different termination of the ſubſtantive: "as God's grace," or, as it was formerly written, "Godis grace," the grace of God. So that the Engliſh ſubſtantives may be conſidered as having two terminations for caſes; that of the nominative, and that of the genitive or poſſeſſive caſe. In this reſpect it bears ſome reſemblance to the German, which is probably derived from the ſame Teutonic original. In the Greek and Latin languages, the words πατρος and *patris* are real caſes of the words πατηρ, and *pater*, and different from thoſe words: and ſomewhat like this may be ſaid of the Hebrew, Arabic, Armenian, Poliſh, and German languages; which in the ſame number admit of changes in the terminations of words: and yet in theſe languages, caſes are different from what they are in the Greek and Latin. The Hebrew names, for inſtance, are not properly declined by caſes, and to be diſtinguiſhed by any peculiar terminations; but they are determined principally by the conſtruction and meaning of the ſentence or diſcourſe in which they occur, or by certain prepoſitions, or letters ſerving the purpoſe of prepoſitions, prefixed to the reſpective words, as in the following example:

| | | |
|---|---|---|
| Nom. | מלך | Rex. |
| Gen. | המלך | Regis. |
| Dat. | למלך | Regi. |
| Accuſ. | את מלך | Regem. |
| Vocat. | המלך | ô Rex. |
| Ablat. | ממלך | à Rege. |

Hebrew nouns very frequently occur in the oblique caſes, although they have no letter or particle denoting theſe caſes; and the letters or particles which make particular caſes are frequently connected with other caſes. The article ה, which grammarians commonly ſpecify as the mark of the genitive, is applied to all the other caſes, and chiefly to the vocative. The relation expreſſed by the genitive caſe of nouns ſometimes occaſions an alteration in them; but this alteration, inſtead of being in the noun governed, as in other languages, occurs in the Hebrew in that which governs, and this word ſometimes loſes one of its letters, and ſometimes has it changed into another; e. g. מלכי ארץ, reges terræ, inſtead of מלכים ארץ; and תורת יהוה, lex domini, inſtead of תורה יהוה. The Maſoretic points are changed in the ſame manner; as דְבַר שֶׁקֶר, verbum falſitatis, for דָבָר שֶׁקֶר. See Regimen.

The letter ל, which is an abridgment of the prepoſitions אל, על, or למען, generally denotes the dative, and not rarely the genitive, and it is alſo joined to the accuſative, ablative, and even the nominative. The particle or prepoſition את, or ואות is connected, not only with the accuſative, but with the dative, ablative, and nominative: and the letter מ, which is the prepoſition מן abridged, is almoſt always joined to the ablative, and very rarely to other caſes. For the changes that expreſs Hebrew pronouns, ſee Pronoun. The caſes in the Chaldee language are determined in the ſame manner with thoſe of the Hebrew; either by the ſenſe of the paſſage in which words occur, or by prefixing the particles ד or די to the genitive, ל to the dative, ית or ל to the accuſative, and מ or מן to the ablative. The Syriac differs from the Chaldee only in two points, viz. that the mark of the accuſative is ל, and not ית, and that the note of the ablative is מן, and not the abbreviature מ. The caſes in the Samaritan language are formed like thoſe of the Chaldee, by prefixing ד to the genitive, ל to the dative, ית, or עם to the accuſative, and מן or מ to the ablative. See Maſclef's Grammat. Heb.

An ingenious writer ſuggeſts that the Greek caſes are formed by certain ſyllables, which conſtitute no part of the primitive names of things, but were originally ſhort words, having an independent meaning of their own, and retaining that meaning when joined to theſe names: thus *σημα*, *θεος*, were originally *σημ*, *θε*; *α*, and *ος*, being annexed to mark them as ſubjects or agents. In aſcertaining the preciſe meaning of the prepoſitions *of*, *from*, *to*, which are the ſigns of the Greek caſes, he intimates, that though the termination called the genitive caſe be rendered by *of*, it means invariably *from*, *beginning*, *motive*; and this appears to be the true ſignification of the term *of*, if we regard its etymology, which this author derives from *αφ*, *απο*, *ab*, *from*; although cuſtom ſeems to have aſſigned it a different undefinable meaning, it is in all caſes reſolvable into the ſenſe of *from*; e. g. a table *of* wood is a table *from* wood, wood being the origin, or beginning of it. This is the reaſon, he ſays, why ſome prepoſitions which ſignify *origin* or *beginning* in Greek, Latin, and French, are rendered in our tongue by *of*. He adds, that as *of* ſignifies *beginning*, ſo *to* means *end*: for it is taken, as he ſuppoſes, from an oriental verb ſignifying *to aim*, *purſue*, or *ſtretch after a thing*, and hence denotes the thing or object aimed at. Into Greek the original verb has paſſed in the form of *τειω* or *τεω*; but in Perſian, Latin, German, and Welſh, as in Engliſh, it has with little variation in ſound, and none in ſenſe, migrated into a prepoſition. But *beginning* and *end*, or if the terms are applied to moral actions, *motive* and *deſign*, are often the ſame. Hence it is that the force of theſe two prepoſitions is expreſſed in Latin by the ſame termination, the dative or ablative caſe. Hence alſo, in all languages which admit of caſes, the dative, ablative, and genitive, have a near affinity to each other; and in Greek, the firſt language, as this writer imagines, in which the uſe of caſes was introduced, they were all three at firſt repreſented by one termination. Jones's Grammar of the Greek tongue, p. 194.

Some writers think, that the relations ſignified by the addition of articles and prepoſitions to the noun may properly be denominated caſes, in Engliſh; and that, admitting this principle, there are, in our language, as many caſes as in the Latin tongue. But Mr. Lindley Murray, in his "Engliſh Grammar," (p. 54. ed. 12.) obſerves, that to this mode of forming caſes for our ſubſtantives there are ſtrong objections. If an arrangement of this nature were to be conſidered as conſtituting caſes, the Engliſh language would have a much greater number of them than the Greek and Latin tongues: for, as every prepoſition has its diſtinct meaning and effect, every combination of a prepoſition and article with the noun would form a different relation, and would conſtitute a diſtinct caſe. Thus our language would be incumbered with many new terms, and a heavy, as well as uſeleſs, load of diſtinctions. Mr. Murray is of opinion, that although this variety of caſes does not at all correſpond with the idiom of our language, we may with great propriety admit a caſe in Engliſh ſubſtantives, which ſhall ſerve to denote the *objects* of active verbs or of prepoſitions; and which is, therefore, properly termed the *objective* caſe. He allows however, that the general idea of caſe has undoubtedly a reference to the termination of the noun; and yet there are many inſtances, both in Greek and Latin, in which the nominative and accuſative caſes have preciſely the ſame form, and are diſtinguiſhed only by the relation they bear to other words in the ſentence. Analogy, therefore, warrants our applying this principle to our own language, as far as utility, and the idiom of it, will admit. It is obvious that in Engliſh, a noun governed by an active verb, or a prepoſition, is very differently circumſtanced, from a noun in the nominative, or in the poſſeſſive caſe; and that a comprehenſive caſe, correſponding to that difference, muſt be uſeful and proper. The buſineſs of parſing, ſays this ingenious grammarian, and of ſhewing the connection and dependence of words, will be moſt conveniently accompliſhed by the adoption of ſuch a caſe; and the irregularity of having our nouns ſometimes placed in a ſituation, in which they cannot be ſaid to be in any caſe at all, will be avoided.

Although it ſhould be maintained, that many of the modern languages have not, ſtrictly ſpeaking, any caſes of nouns; yet moſt, if not all of them, have a kind of caſe in their pronouns, without which it would be hard to conceive the connection, or ſyntax of a diſcourſe; and which, therefore, make a neceſſary part of grammar: e. g. in Engliſh *I* and *me*; and in French, *je* and *moy*. See Pronoun. For the relations expreſſed by each caſe, and the mode of denoting them, ſee Nominative, Genitive, Dative, &c. &c.

Case, in *Printing*, a large flat, oblong frame, placed aſlope, divided into ſeveral compartments, or little ſquare cells; in each of which are lodged a number of types, or letters of the ſame kind; whence the compoſitor takes them out, each as he needs it, to compoſe, and make a page, or form.

A frame of caſes, in printing, uſually conſiſts of two pair, viz. an upper and lower, Roman and Italic. A ſhallow caſe ſhews the letter beſt, as being leaſt ſhadowed by the ſides of the boxes. A deep caſe has the advantage of holding a great number of letters, ſo that the compoſitor need not diſtribute ſo often.

They ſay, *a caſe*, or rather *pair of caſes*, of Greek, of Hebrew, of Pica, &c.

Case of a ſilk worm, is a lodge framed within its web, wherein to depoſit its *ova*.

Case is alſo uſed for a certain numerous quantity of divers things: a caſe of piſtols implies a brace; a caſe of glaſs, &c. ſee Glass.

Case is alſo uſed for a frame ſurrounding a door, window, or the like. In which ſenſe we ſay a door-*caſe*, window-*caſe*, &c.

Case, *action upon the*, in *Law*. See Action.

Case, *ſpecial*, relates to a kind of ſpecial verdict, in which the jury find a verdict generally for the plaintiff, but ſubject nevertheleſs to the opinion of the judge or the court above, on a *ſpecial caſe* ſtated by the counſel on both ſides with regard to a matter of law. This has the advantage over a ſpecial verdict, of being attended with much leſs expence, and of obtaining a much more ſpeedy deciſion; the *poſtea* (which ſee) being ſtayed in the hands of the officer of *niſi prius*, till the queſtion is determined, and the verdict is then entered for the plaintiff, or defendant, as the caſe may happen.

Case *ſtated out of Chancery*, reſpects a queſtion of law in the proceſs of any cauſe referred by this court to the opinion of the judges of the court of King's Bench or Common Pleas; before whom it is heard, and who certify their opinion to the chancellor in order to a decree.

Case-*hardening*, a method of preparing iron, ſo as to render its outer ſurface hard, and capable of reſiſting the file, or any edged tool. It is uſed by file-cutters for coarſe files; by gun-ſmiths, to harden the barrels of guns; and by others, on other occaſions.

The proceſs of caſe-hardening, which is no other than a ſuperficial converſion of iron into ſteel, depends on the cementation of it with vegetable or animal coals. This treatment converts the external part into a coating of ſteel, which is uſually very thin, becauſe the time allowed for the cementation is much ſhorter than when the whole is intended to be made into ſteel. Immerſion of the heated pieces into water hardens the ſurface, which is afterwards poliſhed by the uſual methods. Among the receipts given for this purpoſe are the following: cow's horn or hoof is to be baked, or thoroughly dried and pulverized: to this add an equal quantity of bay-ſalt; mix them with ſtale chamber ley, or white wine vinegar. Cover the iron with this mixture, and bed it in the ſame in loam, or incloſe it in an iron box: lay it then on the hearth of the forge to dry and harden: then put it in the fire, and blow till the lump have a red heat, and no higher, leſt the mixture be burned too much. Take the iron out, and immerſe it in water, to harden. See Iron and Steel.

Case-*ſhot*, are muſquet-balls, ſtones, old pieces of iron, or the like, put up into caſes, and ſo ſhot out of great guns.

Caſe-ſhot is chiefly uſed at ſea, to clear the enemies' decks when they are full of men.

CASEARIA, in *Botany*, Schreb. 756. Willd. 877. Jacq. Amer. 132. Claſs and order, *decandria monogynia*.

Gen. Ch. *Cal.* Perianth four or five-leafed, or four or five-cleft; leaves oblong, flat, coloured, widely ſpreading. *Cor.* none. *Nect.* four or five-leafed; leaflets oblong, obtuſe, hirſute, rather erect, half the length of the ſtamens, and alternating with them. *Stam.* Filaments eight or ten, awl-ſhaped, rather erect; anthers oblong, incumbent. *Piſt.* Germ roundiſh; ſtyle filiform, erect, the length of the ſtamens; ſtigma capitate, obtuſe. *Peric.* Capſule roundiſh, obtuſe, crowned with the permanent baſe of the ſtyle, one-celled, coriaceous, thick, three-valved. *Seeds* generally more than one, compreſſed, angular, fixed to the valves, immerſed in a ſoft pulp.

Eff. Ch. *Cal.* five-leafed. *Cor.* none. *Nect.* four or five-leafed. *Stamens* alternate, with the leaflets of the nectary. *Capſ.* berried, three-valved, one-celled; ſeeds in a ſoft pulp.

Sp. 1. C. *ſpinoſa*, Willd. 1. (C. aculeata; Jacq. Amer. 133. Samyda ſpinoſa; Linn. Sp. Pl. 2. Swartz. Obſ. p. 179. Poiret Encyc. 11.) "Flowers octandrous; leaves egg-ſhaped, ſerrated, ſmooth; peduncles axillary, one-flowered; branches ſpinous." A ſhrub about ſeven feet high. *Branches* numerous, diffuſe, furniſhed when young with a few diſtant and ſolitary ſpines. *Leaves* an inch and half long, crowded. *Flowers* axillary, cluſtered; peduncles ſhort, one-flowered; calyx white; leaves oblong, obtuſe; filaments awl-ſhaped; anthers oblong. *Fruit* greeniſh purple, mucronate at its ſummit. A native of St. Domingo. 2. C. *nitida*, Willd. 2. Jacq. Amer. 132. Act. Helv. 8. p. 58. fig. 1. (Samyda crenata; Poiret Encyc. 12.) "Flowers octandrous; leaves egg-ſhaped, crenate, ſmooth; cymes axillary, peduncled." A ſhrub about fifteen feet high. *Branches* numerous, ſpreading. *Leaves* from an inch and half to four inches long, alternate, petioled, very variable in ſize and form. *Flowers* ſmall, whitiſh; leaves of the calyx obtuſe. *Fruit* roundiſh; pulp ſcarlet or purple. *Seeds* two, ſometimes only one. A native of America in the neighbourhood of Carthagena. Perfectly diſtinct from Samyda nitida. 3. C. *hirta*, Willd. 4. Swartz. Fl. Ind. Occid. 2. p. 756. (Samyda tomentoſa; Swartz. Prod. 68. Poir. 12.) "Flowers octandrous; leaves egg-ſhaped, ſerrated, rough with hairs underneath." A ſhrub ſeven or eight feet high. *Branches* alternate, cylindrical, a little angular, pubeſcent. *Leaves* alternate, acute at the ſummit, a little narrowed at the baſe, nerved and veined, on very ſhort petioles. *Flowers* axillary and lateral, faſcicled, on ſhort peduncles, with membranous ſcales at their baſe; calyx four-cleft; ſegments deeply divided, linear, lanceolate, obtuſe, pubeſcent, whitiſh, green underneath, permanent; filaments ſtraight, awl-ſhaped; anthers heart-ſhaped, erect, yellowiſh; ſtyle trigonous; ſtigma capitate, a little trifid. *Fruit* oblong, ſomewhat acuminate. A native of Jamaica. 4. C. *parviflora*, Willd. 5. (Samyda parviflora; Linn. Sp. Pl. 1. Poir. 13. S. foliis ovatis cum acumine; Brown, Jam. 217. Arbor baccifera, &c. Sloane Jam. 137. hiſt. 108. tab. 211. fig. 2.) "Flowers decandrous; leaves oblong, acuminate, ſlightly crenate, ſmooth on both ſides, ſhining; peduncles crowded, axillary, one-flowered." A ſhrub. *Branches* diffuſe, cylindrical, rather crooked, ſmooth, blackiſh brown, ſometimes ſprinkled with very ſmall oval greyiſh or yellowiſh ſpots. *Leaves* about three inches long, an inch and half broad, alternate, thin, almoſt membranous, rather pale underneath; with a few lateral, ſimple, alternate nerves, and reticulated veins; on ſhort petioles. *Flowers* whitiſh, axillary, ſolitary, or in ſmall tufts; peduncles not leſs than half an inch long, ſimple, cylindrical, upright; calyx deeply five-cleft, ſmooth, caducous. *Fruit* ſmall, globular; pulp yellowiſh. A native of Cayenne. 5. C. *parvifolia*, Willd. 6. Jacq. Amer. tab. 85. (Anavinga; Lam. Illuſ. Pl. 355. fig. 2. Samyda parvifolia; Poir. 14.) "Flowers decandrous; leaves egg-ſhaped, acuminate, ſerrated, ſmooth; peduncles one-flowered, aggregate, lateral." A ſhrub about fifteen feet high. *Stems* erect. *Branches* diffuſe, ſlender, long. *Leaves* alternate, about an inch long. *Flowers* not axillary; peduncles ſimple; leaves of the calyx whitiſh, reflexed, egg-ſhaped, obtuſe; filaments unequal, nearly as long as the calyx. A native of Martinico. 6. C. *ſylveſtris*, Willd. 7. Swartz. Flor. Ind. Occid. 2. p. 752. (Samyda ſylveſtris, Poir. 15.) "Flowers decandrous: leaves egg-ſhaped, acuminate, quite entire; branches rod-like; peduncles axillary, crowded." A ſhrub. *Stems* ſmooth. *Branches* long, ſlender, looſe, cylindrical. *Leaves* alternate, acuminate to a great length, thin, ſmooth on both ſides, ſhining, veined, porous when held againſt the light, on ſhort ſmooth petioles. *Flowers* twenty or thirty together; peduncles about three lines long, ſimple ; furniſhed at their baſe with ſmall, dry, imbricated ſcales ; calyx very ſmall, whitiſh ; leaves oval, open, pubeſcent ; filaments the length of the calyx ; anthers whitiſh, heart-ſhaped ; germ ovate ; ſtyle trigonous. *Fruit* about the ſize of a pepper-corn, reddiſh. A native of Jamaica. 7. C. *macrophylla*, Willd. 8. Vahl. ecl. 2. p. 32. (Pitumba guianenſis ; Aubl. guian. vol. 2. tab. 385. Samyda pitumba ; Poir. 16.) "Flowers decandrous, ſomewhat tomentous ; leaves elliptical, acuminate, ſlightly crenate." A ſhrub. *Branches* cylindrical, ſmooth, ſpotted. *Leaves* from ſix to eight inches long, more than three broad, petioled, alternate, firm, thick, coriaceous, ſprinkled with pellucid dots, ſmooth on both ſides, deep green above, paler and ſomewhat ruſſet underneath ; marked with lateral, curved, deep brown nerves ; and with tranſverſe, ſcarcely reticulated veins. *Flowers* in ſmall axillary branches ; peduncles ſhort, ſimple ; calyx ſmall. *Fruit* about the ſize of a walnut. A native of Cayenne and many other parts of South America. 8. C. *ſerrulata*, Willd. 9. Swartz. Flor. Ind. Occid. ii. p. 754. (Samyda niviana : Poir. 17.) "Flowers decandrous ; leaves ovate-lanceolate, ſlightly ſerrated ; little branches zig-zag ; peduncles axillary, crowded." A ſhrub. *Branches* ſmooth, cylindrical, long, covered with a cinereous bark ; ramifications ſcattered, almoſt filiform, ſtriated. *Leaves* an inch and half long, alternate, a little acuminate, ſmooth on both ſides, bright green above, nerved and veined, on ſhort petioles. *Flowers* whitiſh, very ſmall, axillary, ten or twelve in a bunch ; peduncles about a line long, furniſhed at their baſe with ſmall membranous ſcales ; calyx-leaves oval, concave, ciliated ; filaments very ſhort ; anthers ovate-heart-ſhaped ; ſtyle awl-ſhaped ; ſtigma obtuſe. A native of the iſland of Nevis. 9. C. *hirſuta*, Willd 12. Swartz. Flor. Ind. Occid. ii. p. 755. (Samyda hirſuta ; Poir. 18.) "Flowers decandrous ; leaves egg-ſhaped, acuminate, tooth-ſerrated, hairy, villous underneath ; peduncles lateral, crowded." A ſhrub. *Stems* woody. *Branches* cylindrical, flexible, pubeſcent. *Leaves* large, alternate, petioled, ſoft. *Flowers* in ſmall lateral branches, not axillary ; calyx-leaves ovate-lanceolate, whitiſh, pubeſcent, a little villous ; filaments ſtraight, awl-ſhaped ; anthers oval ; ſtyle trigonous, the length of the filaments. *Fruit* oval, trigonous. A native of Jamaica and Hiſpaniola. 10. C. *viridiflora*. (Samyda viridiflora ; Poir. Encycl. 19.) "Leaves ovate-elliptical, ſmooth, ſomewhat coriaceous ; flowers nearly ſeſſile, axillary, faſciculated." A ſhrub. *Branches* ſmooth, cylindrical, long. *Leaves* from four to five inches long, two and a half broad, alternate, membranous, glaucous green, inclining to yellowiſh, nearly entire, with lateral nerves and reticulated veins, on ſhort petioles. *Flowers* pubeſcent, greeniſh, ſhort, with five ovate, rather obtuſe ſegments. A native of the Eaſt Indies, deſcribed from a dried ſpecimen in the herbarium of La Marck.

CASEARIA *ramiflora*, Willd. 3. See ATHENÆA *guianenſis*. Willdenow is right in his arrangement. This plant is properly a caſearia ; and the genus athenæa of Schreber, (Iroucana of Aublet,) ought to be aboliſhed. The number of ſtamens, it is now allowed, cannot determine a generic character. C. *elliptica* and *ovata*, Willd. 9, 10. See ANAVINGA *lanceolata* and *ovata*.

Profeſſor Martyn has omitted all our ſpecies, having inadvertently referred from caſearia to ſamyda, and from ſamyda back again to caſearia.

Poiret has united caſearia to ſamyda, and obſerves, that theſe two, anavinga and aquilaria, are all nearly allied, agreeing with each other in the inſertion of the ſtamens into a particular body, attached to the inner part of the calyx near its baſe ; and differing only in the manner of their inſertion, and in the number of the valves and cells of the capſule. The rim into which the ſtamens are inſerted, and which has been uſually called a nectary, he thinks is properly a monopetalous corolla, adnate with the calyx, and toothed or divided almoſt to its baſe. Into this corolla the filaments are inſerted, either looſe, as in anavinga, aquilaria, and the original caſearia, or adhering, through their whole length, to its teeth, as in the original ſamyda, and thence giving the anthers the appearance of being ſeſſile. Conſidered in this point of view, they would form one well-marked genus, having for its eſſential character "a very ſhort, monopetalous corolla, with the ſtamens inſerted into its tube." It is ſufficiently evident from the deſcription of the ſpecies of caſearia given above, that a monophyllous or polyphillous calyx can by no means be admitted as generic diſtinctions. Such an union would, in our judgment, be a real improvement to ſcience, as it would render our ideas of the ſubject more compact and not leſs diſtinct. Though the ſpecies at preſent known are not very numerous, they might be conveniently thrown into ſeparate ſections, nearly correſponding with the preſent genera. The ſolitary ſpecies now conſtituting the whole of the genus aquilaria would differ the moſt from its congeners on account of its two-celled, two-valved capſule. See Poiret in Encyc. Method. vol. vi. p. 487.

CASEI DI CAVALLO, the name of a peculiar cheeſe, famous in Italy, and many other places, and made of the milk of the female buffalo, that ſpecies being as commonly tamed and kept there as the ox and heifer with us.

CASEL, JOHN, in *Biography*, a learned German, was born at Gottingen in 1533 ; and having ſtudied in ſeveral univerſities, travelled to Italy, and was made doctor of laws at Piſa. In 1563 he became profeſſor of philoſophy and eloquence at Roſtock, and afterwards at Helmſtadt, where he died in 1613. He excelled in his knowledge of the Greek fathers ; and he warmly oppoſed Daniel Hoffman and others, who maintained that philoſophy is adverſe to theology, and that many things are true in the latter which are falſe in the former. He carried on a correſpondence with ſome of the moſt eminent ſcholars of his age ; and left many works, both Greek and Latin, in verſe and proſe. A collection of his letters was printed at Frankfort in 1687, 8vo. Moreri.

CASELLA. We uſed to imagine that this was only a poetical character in the *Purgatorio* of Dante ; but as his commentators call him an ancient Italian muſician and compoſer, he muſt not be paſſed without a ſalutation ; particularly as his exiſtence has been acknowledged by *Lemmo da Piſtoia*, who flouriſhed in 1300, and in a note to one of his madrigals, preſerved in the Vatican library, which ſays, *Caſella diede il ſuono*, "this madrigal was ſet to muſic by *Caſella*."

There is ſomething in the deſcription of this imaginary rencontre ſo ſimple and affectionate, that I cannot help wiſhing to convey an idea of it to my Engliſh reader. Dante, after viſiting the infernal regions with Virgil, is conducted by the ſame poet into purgatory ; where, ſoon after his arrival, he ſaw a veſſel approach the ſhore laden with departed ſouls, under the conduct of an angel, who brought them thither to be cleanſed from their ſins, and rendered fit for Paradiſe : as ſoon as they were diſembarked, ſays the poet, "they began like beings landed on a foreign ſhore, to look around them :

"On me when firſt theſe ſpirits fix their eyes,
They all regard me with a wild ſurpriſe,
Almoſt forgetting that their ſins require
The purging remedy of penal fire :

When one of theſe advanc'd with eager pace,
And open arms, as me he would embrace;
At ſight of which I found myſelf impell'd
To imitate each geſture I beheld.
But vain, alas! was ev'ry effort made,
My diſappointed arms embrace a ſhade:
Thrice did vacuity my graſp elude,
Yet ſtill the friendly phantom I purſued.
My wild aſtoniſhment with ſmiling grace
The ſpectre ſaw, and chid my fruitleſs chace.
The voice and form now known, my fear ſuſpend,
O ſtay, cried I, one moment with thy friend!
No ſuit of thine is vain, the viſion ſaid,
I lov'd thee living, and I love thee, dead.
But whence this haſte?—not long allow'd to ſtay,
Back to the world thy Dante takes his way—
Yet let this fleeting hour one boon obtain,
If no new laws thy tuneful pow'rs reſtrain,
Some ſong predominant o'er grief and woe,
As once thou ſung'ſt above, now ſing below;
So ſhall my ſoul, releas'd from dire diſmay,
O'ercome the horrors of this dreadful way.
Caſella kindly deign'd his voice to raiſe,
And ſung how *Love the human boſom ſways*,
In ſtrains ſo exquiſitely ſweet and clear,
The ſound ſtill vibrates on my raviſh'd ear;
The ſhadowy troops, extatic, liſt'ning round,
Forgot the paſt and future in the ſound."

CASELLA, *Ital.* a ſmall houſe, but in *Muſic* it implies a *bar*, a compartment, containing ſuch a portion of notes as the character or characters for time direct at the beginning of a movement. See TIME, BAR, MEASURE.

CASELLE, in *Geography*, a town of Italy, in the principality of Piedmont, on a ſmall river which runs into the Stura; 6 miles N. of Turin.

CASEMATE, or CASEMENT, in *Architecture*, the ſame with *cavetto*, denotes a hollow moulding, which ſome architects make one-ſixth of a circle, and others one-fourth.

CASEMATE, from the Spaniſh word *caſamata*, or from the Italian word *caſamatta*, in *Military Language*, a low, covered, or concealed houſe. A caſemate may in general be defined to be a ſubterraneous or covered arched work. Caſemates are made in garriſoned places, in order to place the troops of the garriſons, when off from duty, under, from ſhells, &c. They are alſo made ſometimes under different parts of the rampart of a place with embraſures, for cannon, or loop holes for muſquetry.

This name is alſo given to ſubterraneous or covered arched works, on that part of either flank of a baſtion, which is next to the adjoining curtain made there for placing ſome guns in, to defend the paſſage of the moat or ditch, the face of the oppoſite baſtion, and the approaches to any breach that may be made in it. That part of the flank is taken inwards towards the capital of the baſtion, that it may be covered from the enemy's or beſieger's fire, by the remaining part of it, which, when rounded, is called a round *orillon*, but when left without being rounded, is called a ſquare *orillon*. The part of the flank thus taken inwards is therefore called the retired or covered flank, as alſo *caſemate* and *place baſſe*; and the ſide of it next to the curtain is generally in the continuation of the line of defence, which part of the ſaid line is called the *retirade*, or retrenchment of the flank, or the platform of the caſemate. The vaults or caſemates in this retired flank have commonly the ſoles or bottoms of their embraſures a little above the terre plain or level of the place or country, in order that the guns in them may fire over the parapet of the fauſſe braye, in the ditch before it, if there be any.

Caſemated flanks are rarely made uſe of at preſent, becauſe the enemy's batteries can generally bury the cannon contained in them under the rubbiſh and ruins of their vaults, and becauſe the ſmoke, with which they are always in a ſhort time filled, renders them inſupportable to thoſe who ſerve the guns, notwithſtanding all the flues, vents, or air-holes that can be made in them. Beſides theſe inconveniences, muſquetry, if they be expoſed to its fire, will, within a certain diſtance, when properly made uſe of, always ſilence cannon, whether they be in caſemates or not. Engineers, therefore, at preſent commonly make their retired flanks open at top, and call them low flanks, or *flancs bas*.

A low flank ought to have a horizontal depth or thickneſs of at leaſt 16 yards; to wit, 3 for its parapet, and 5 for its terre-plain, or rampart behind the parapet, and if there be two of them, they ought together to have a breadth or thickneſs of at leaſt 32 yards.

Low flanks have ſeveral diſadvantages. If there be more than one of them in the ſame flank, they cannot well be made uſe of at once on account of the flame and flaſhing of the powder and the rubbiſh that is conſtantly tumbling down from one of them into another. They become almoſt uſeleſs when the ravelin is once taken, by reaſon of the command it has over them, unleſs they be remarkably well covered by the orillons. And the rubbiſh which falls down from the higher flanks upon the lower, forms a gentle ſlope for the enemy to mount on to the aſſault. The beſt low flanks, perhaps, are the tenailles, or thoſe parts of the fauſſe braie of the ditch, that are in front of or oppoſite to the flanks, and diſtant from them reſpectively from 20 to 24 yards.

The chevalier Antoine de Ville, in ſpeaking of the inconveniences and inutility of caſemated low flanks, expreſſes his ſentiments thereon in the following words: "Autrefois on faiſoit aux flancs des voutes où on mettoit le canon tout couvert, et par deſſus ils en faiſoient d'autres pour mettre d'autres canons; mais cela n'eſt plus en uſage, à cauſe des grandes incommoditez, qu'ont a veu arriver en ces places. Car apres qu'on avoit tiré, la fumée rempliſſoit de telle façon ces voutes, qu'il etoit impoſſible d'y demeurer dedans, ni rien voir pour recharger, quelques ſouſpiraux qu'on y peut faire, outre que l'etonnement du canon ebranloit tout; et l'ennemy tirant dans ces voutes baſſes, les eclats et debris bleſſoient et tuoient ceux, qui eloient dedans, et en peu de coups les melloient en ruine. C'eſt pourquoi on a laiſſé ces voutes et on fait les places baſſes decouvertes. Et pour avoir deux places on fait le premiere plus baſſe un peu par deſſus les parapets des fauſſe-brayes, s'il y en a. Les meſures quant a leur face ſont du tiers du flanc, ou de la mortié, comme nous avons dit. Leur profondeur en dedans et de quatrepas, qui ſont pour les merlons, ſix pas pour le dedans a mettre les canons, et trois pour les voutes lorſqu'on les met en ce lieu. La place baſſe doit aller en elargiſſant du cote de la courtine afin que le canon, qui eſt la, puiſſe etre pointe vers la contreeſcarpe.

Du cote de la courtine doit etre l'entrée ou voute, qui doit commencer au dedans de la ville, paſſant par deſſous le rampart de largeur et hauteur ſuffiſante pour pouvoir mener par là le canon et munitions."

CASEMENT, is uſed in building for a little moveable window, uſually within a larger, being made to open or turn on hinges. We ſay, a ſingle caſement, a folding caſement, a caſement with a lock, with a turn-about, or turn-buckle, a caſement with a cock-ſpur or pull-back at the hind-ſide, wherewith to draw it to.

CASENA, or Cassena, in *Geography*. See Kassina.

CASENDORF, a town of Germany, in the circle of Franconia, and principality of Culmbach; 7 miles S.W. of Culmbach.

CASENI, a town of Perſia, in the province of Irac; 160 miles E. of Iſpahan.

CASEOUS, ſomething that partakes of the nature or qualities of cheeſe, which ſee.

CASERNS, in French *caſernes*, in *Military Language*, are, ſtrictly ſpeaking, ſmall houſes built along by the rampart of a fortified place, for lodging the ſoldiers of the garriſon, in order to render them as little troubleſome as poſſible to the inhabitants. Each caſern for the infantry has generally two beds for ſix ſoldiers, three and three. One-half of theſe mount guard whilſt the others remain there to ſecure that quarter. And each caſern for the cavalry commonly holds four horſemen. But neither theſe nor any other caſernes that are erected, either adjoining the rampart or partly connected therewith, are carried along any other parts of it than thoſe that are behind the curtains, or lie between the baſtions, acroſs the gorges of which they ſeldom or ever extend.

Caſernes ſignify not only ſuch ſmall houſes as we have juſt been ſpeaking of, but alſo any buildings or edifice, however large or extenſive, erected, and deſtined for the reception and accommodation of troops. In a city of war, or fortified place, they are commonly conſtructed between the rampart and the houſes of the town or city, as being there moſt convenient for guarding againſt and preventing ſurpriſes. The caſernes or barracks for the infantry ſhould be kept ſeparate from thoſe of the cavalry and dragoons, as they are at Niſmes and ſeveral other places in France; and the laſt of theſe ought to be placed as near as poſſible to convenient or commodious watering-places for horſes. In France, and ſome other countries on the continent of Europe, theſe buildings have generally been erected in large towns and cities at the expence of the inhabitants, and in ſmall ones at that of the ſtate. But in this country the expenditure on all ſuch erections is defrayed by the public. They ſhould as much as is poſſible, when it can conveniently be done, be placed towards the eaſt, on account of the air. When there is ground enough for the purpoſe, it is of advantage to incloſe with them a ſquare or rectangular ſpace, ſufficiently large, not only for parading, but alſo for exerciſing the troops. The ſoldiers are then eaſily confined to their quarters, and kept out of the way of quarrels, riots, and miſchief. They are more obſervant of order and regularity, being immediately under the eyes of their officers, than they are when diſtributed among the houſes of the inhabitants. And as they then are, as it were, in one body, and the rooms they are lodged in are contiguous to one another, and not far from the apartments of their officers, orders can be executed with more diſpatch and privacy than when they are either lodged in ſeparate or detached places, or are billetted and diſperſed about among the citizens. In time of war, or during a ſiege, many inconveniences may ariſe from having the ſoldiers ſcattered about in the houſes of the inhabitants of a fortified town or city, inſtead of having them collected together in one body, or in a few ſeparate and diſtinct bodies, under the inſpection at all times of their officers. In caſe of any alarms happening, the governor or commandant of the place cannot aſſemble the garriſon without a good deal of trouble and a conſiderable loſs of time. Should he wiſh to ſend a party or corps out of it either on ſorties or other duty, he cannot do it without the knowledge of the whole town or city. Such a diſperſion of troops tends to render them diſorderly, diſſolute, and negligent of diſcipline; whereas the keeping of them together in barracks or caſernes, contributes much towards the obſervance and maintainance of it.

Caſernes or barracks are built and conſtructed differently, according to the ſituations on which they are placed. When the ground will admit of it, as we have already obſerved, it is advantageous to encloſe with the buildings a ſquare or rectangular ſpace, yard, court, or area ſufficiently large for not only parading the troops, but alſo for all the exerciſes of detail, and that too for either infantry or cavalry, who ought to be kept ſeparate. For a large court or area is neceſſary for the one as well as for the other. In ſuch buildings galleries ſhould be carried along their whole extent, to furniſh an eaſy communication between the different rooms or chambers. When they are erected for cavalry, the men ought to be lodged immediately over the ſtables for their horſes.

When barracks are built along by the rampart oppoſite to the curtains, as marſhal Vauban has practiſed in a good many places, they are generally compoſed of large bodies of buildings for the troops to lodge in, and at the ends or extremities of them are barracks or pavilions erected for the officers. Theſe barracks or caſernes are commonly two ſtories high, independent of the ground floor or ſtory; and ſometimes three.

In every body of double barracks, there are, for the moſt part, on each ſtory four rooms, each two of which anſwer to the ſtair-caſe next to it. Every room ought to be at leaſt 22 feet long and 18 feet wide, which is a ſize ſufficient for four beds. Thoſe on the ground floor ſhould be not leſs than 12 feet high, thoſe in the next ſtory 10, and thoſe in the upper ſtory ſhould be at leaſt 8 feet high. The doors ought to be 6 feet 4 inches high, and 3 feet at the leaſt wide. And whether they be built with bricks or ſtones, the walls ought to be two feet thick or upwards. A ſort of *cordon* is ſometimes made in the walls, at the upper part of each ſtory, which is uſeful in helping to preſerve the faces or outſides of them, by preventing water or moiſture from running or trickling down them. In the barracks at Woolwich the rooms are too ſmall, being each of them only 16 feet ſquare. There has been no general rule, indeed, either eſtabliſhed or obſerved in this country for ſuch buildings, and the ſizes of the rooms or apartments in them.

Though barracks or *caſernes* of any form or deſcription are ſeldom or ever erected along by thoſe parts of the rampart, where the flanks and faces of the baſtions are, as they are along by thoſe that lie between the baſtions, yet when theſe works are empty, inſtead of being as they generally are, eſpecially ſuch of them as are not likely to form part of any front, that may be attacked by a beſieging enemy, it may not only be adviſable, but extremely uſeful, to erect barracks, or caſernes, oppoſite to their gorges, and at ſome little diſtance from the ſame, converting the interior areas or parts of them into gardens to be cultivated by the troops inhabiting thoſe buildings. Theſe would furniſh them not only with a conſiderable proportion of their nouriſhment, but alſo with proper and uſeful exerciſe, and agreeable walks, without leſſening or diminiſhing in any way, or manner whatſoever, the ſtrength or defence of the place. In fortified towns or cities, however, with encloſures of conſiderable extent, and large garriſons, the barracks,

racks, or caſernes, are generally erected along by the works in different places ſeparate and diſtinct from one another, but with eaſy and ſpeedy communications, there being ſeldom more ſuch buildings in one of thoſe places than what are ſufficient for lodging two battalions. In conſequence of this precaution, arrangement, and diſtribution of their garriſons, thoſe entruſted with their defence are leſs apprehenſive of being ſurpriſed than they otherwiſe would be, as the different parts of the works are thereby equally guarded and defended. Such an arrangement, however, is not always made or obſerved in fortified places. For barracks, that have been formerly erected without any regard to ſuch a diſtribution, are commonly repaired as long as they are capable of receiving repairs, or being rendered uſeful. And in Roman Catholic countries old religious edifices and buildings originally erected for pious purpoſes, which for the moſt part are agreeably and eligibly ſituated, are frequently converted into barracks if they happen to be near the gates or principal works.

Whilſt the feudal ſyſtem exiſted, and chivalry was in repute, the militia, which it ſupplied in every ſtate or country where it prevailed, formed all the troops that either the barons made uſe of in their feuds and contentions, or ſovereigns employed in the forcible aſſertion of their claims and pretenſions. During the prevalence of that ſyſtem there was no ſtanding army or regular military eſtabliſhment either in this country or on the continent of Europe. And as ſuch forces were ſeldom aſſembled or brought together but on the ſpur of the occaſion, or at the moment, when they were going to attack, repulſe, or engage their enemies; as they very rarely took the field but in mild and ſeaſonable weather and were generally diſmiſſed, before the ſetting in of winter or the rainy ſeaſon to return to their reſpective homes and places of cuſtomary abode, it was not neceſſary to erect barracks for them to lodge in. As the ſtrength of that ſyſtem became ſomewhat broken, and the rigour of it began to decline in the time of Charles VII. of France and his contemporaries, he and ſome others of them, inſtructed by experience and influenced by mutual example, began the practice of keeping bodies of troops conſtantly on foot and in pay. From this originated the neceſſity of conſidering the beſt and moſt advantageous manner of providing habitations or lodgings for them. But as the military eſtabliſhments under theſe princes and their ſucceſſors were but ſmall, even in time of war, and very trifling during peace, the difficulty of procuring lodgings for them was not great. At preſent, however, when ſuch eſtabliſhments are much increaſed and augmented, the beſt manner of lodging them, either in garriſons and along the frontiers, or in the interior parts of a country, becomes a matter of ſerious concern to the prince or ſtate.

When troops are to remain for a conſiderable time in one place there are four different ways, in which they may be lodged or diſpoſed of, namely, in tents, in huts, in barracks, or in the houſes of the inhabitants. To make ſoldiers live conſtantly either in tents or huts would be prepoſterous and abſurd, as it would operate injuriouſly to their health and fitneſs for ſervice when neceſſary, ſubjecting them to unneceſſary hardſhips and inconveniences, without any ſaving or diminution of expence to the nation to which they belong. No queſtion then on this ſubject remains but between the propriety of keeping them in barracks or the diſtributing of them among the houſes of individuals.

As a ſoldier is a man, and ought to be regarded as a citizen or member of the community in every country, but more eſpecially in a free one like Great Britain; and is moreover entruſted with the defence of our perſons and property, ſome attention ſhould be paid to his comfort and convenience. To preſerve, however, public tranquillity during peace, particularly in a nation under an arbitrary or monarchical government, and enſure ſucceſs to its operations in time of war, ſoldiers ſhould be ſubjected to an exact and a rigorous diſcipline, for the due obſervance of which they ought to be ſo diſpoſed of as to be frequently viſited and looked at without much trouble or difficulty, to be eaſily aſſembled, to have their conduct liable to conſtant notice and inſpection, to have their mode of eating and living daily and properly attended to, and to be able to execute with promptitude and expedition the orders that may be given to them from time to time. But ſtrict attention to theſe eſſential circumſtances is in a great meaſure incompatible with their being ſcattered or diſperſed over the whole of a large town or city. For it muſt certainly be allowed that ſuch a diſperſion of them has a great tendency to weaken and deſtroy diſcipline, to render them riotous and diſſolute, and to create in them a diſlike of order and ſubordination, and a ſtrong inclination for indolence, ſoftneſs, and eaſe. In deſpotic countries, or where mercenaries are partly employed, it is not only deſtructive of diſcipline, but extremely dangerous. It is, therefore, a natural and invariable maxim of ſuch governments to keep their troops as ſeparate and diſtinct as poſſible from the reſt of their ſubjects, to inſpire them with views and ſentiments repugnant to theirs and incompatible with civil liberty, and to make them believe, that their intereſts are not only different from, but oppoſite to thoſe of the people; as their deſpotic mandates, oppreſſive impoſitions, and arbitrary regulations muſt be enforced when neceſſary by the ſoldiers, and the people muſt be rendered ſubmiſſive and obedient to them by the terrors of military execution. In this free country, however, things of this kind ought to be guarded againſt with the utmoſt caution and circumſpection. Eſpecial care ſhould be taken to prevent the ſoldiers from forgetting that they are citizens, or from ſuppoſing that their intereſts are in any way diſtinct from or inconſiſtent with thoſe of their fellow ſubjects. It ought to be inſtilled into their minds, that they are ſerving and are to fight, not only for their king, but alſo for themſelves, and for their country, her conſtitution, her liberties, and her laws. An intercourſe between them and the people, inſtead of being prevented or diſcountenanced, ſhould not only be permitted but countenanced. And they ought never to be confined to barracks to the prevention of ſuch an intercourſe, but in certain circumſtances, and on certain occaſions. Our learned commentator on the laws of England, in expreſſing his ſentiments on this ſubject, makes uſe of the following words. “ Nothing ought to be more guarded againſt in a free ſtate than making the military power, when ſuch a one is neceſſary to be kept on foot, a body too diſtinct from the people. Like ours, therefore, it ſhould wholly be compoſed of natural ſubjects; it ought to be enliſted for a ſhort and limited time; the ſoldiers alſo ſhould live intermixed with the people; no ſeparate camp, no barracks, no inland fortreſſes ſhould be allowed. And perhaps it might be ſtill better, if, by diſmiſſing a ſtated number, and enliſting others at every renewal of their term, a circulation could be kept up between the army and the people, and the citizen and the ſoldier be more intimately connected together.” Blackſtone's Commentaries, book i. page 413. See ARMY.

In attempting any reform or amelioration of our military eſtabliſhments we ought never to forget, that Great Britain is an iſland, and reſts not principally on her troops for her defence, that we have ſeldom or ever any neceſſary occaſion for employing them on the continent, and that it is therefore prepoſterous and abſurd to think of aſſimilating our military ſyſtem in every reſpect to thoſe of the other nations of Europe, which have no other ſecurity, protection, or defence. The maxims, that thoſe employed as the defenders of this iſland ſhould think of nothing but their muſquets, that they ſhould be rendered a ſort of mere machines at the riſk of undergoing even a degradation of intellect, and that they will not fight the better in defence of it for having ſtakes in it to loſe, are not only ridiculous, but truly abominable. Were not the nobleſt, the moſt glorious and moſt ſucceſsful ſtruggles in ſupport of freedom and independence, that are recorded in the annals of mankind, made by ſtates who did not even enjoy the immenſe advantages of our inſular ſituation, who had no ſeparate military eſtabliſhments, whoſe troops were their citizens, who after the emergencies that called for their ſervices and exertions were paſt, returned to their various occupations in ſociety, and to the peaceful purſuits of life? And were not the troops of that people who conquered the world, compoſed entirely of citizens, who after performing the ſervices they were employed on, returned to mix with the reſt of the community? As to the idea of theſe united iſlands having a regular ſtanding military force ſufficient for enabling us to reſtore the continent of Europe to an equilibrium, or to preſcribe to the different powers in it their relative degrees of ſtrength and territory, it is too extravagant to be entertained by any but the moſt viſionary and wildeſt of men, who, cheriſhing ſuch chimeras, loſe ſight, not only of the conſtitution of this country, but of every principle and conſideration that ought to govern their deliberations reſpecting her welfare, ſecurity and defence.

We will not, like the learned judge, go ſo far as to aſſert, that no barracks ought to be allowed. For within works and fortified places, ſuch as Portſmouth and Plymouth, if the latter, indeed, deſerves the appellation, they may be proper, allowable, and neceſſary. But out of ſuch places they ought not, on any account or pretext whatſoever, to be tolerated to any great extent.

In this country there never has been any certain or eſtabliſhed rule for the building of barracks, and the relative dimenſions of their ſeveral component parts. But in France, which has always been a kind of arbitrary government, and is at preſent a peculiar ſpecies of military deſpotiſm, ordinances for that purpoſe were made from time to time. Even in that country, however, ſuch regulations have not been at all times ſtrictly obſerved or attended to.

CASERTA, in *Geography*, a city of Naples, in the country of Lavora, about 16 miles from the capital, ſituated at the foot of a lofty ridge of hills and irregularly built. This place is famous for the magnificent palace cauſed to be erected by Charles III. of Spain, according to the deſigns of Vanvitelli, and ſurpaſſing in ſize and ſolidity almoſt every royal edifice in Europe. The vaſt dimenſions of its apartments, the bold ſpan of their ceilings, the excellence and beauty of the materials employed in building and decorating it, and the ſtrength of the maſonry, claim the admiration of all beholders, who muſt confeſs it to be a dwelling ſpacious and grand enough to have lodged the ancient maſters of the Roman world. The two principal fronts are 787 feet in length, and contain five ſtories of 37 windows each. The two other ſides are 616 feet long, and conſiſt alſo of five ſtories, in each of which are 27 windows. The interior is divided into four courts, and in the centre of the palace is a ſuperb ſtair-caſe, crowned by a circular hall which affords a communication to every ſet of apartments. The richeſt marbles are diſplayed with profuſion, moſt of them being dug out of quarries within the realm. The chapel is incruſted with pannels of yellow marble. The theatre is a maſter-piece of art; antique columns of alabaſter ſupport the roof and divide the houſe into 42 boxes richly decorated, and ſo arranged as to ſet off both actors and ſpectators to the beſt advantage. The gardens are very extenſive, but formed with wide ſultry alleys and crowded rows of ſtatues. A broad canal interſects the garden and paſſes to the hills at the diſtance of nine miles from the city, where it collects, for the ſupply of the palace, the ſtreams that in ancient times were conveyed to Capua; and theſe are conſigned to one regular channel, and conducted by an eaſy fall along the ſinuoſities of ſeveral vallies. The depth of one hollow, and the height of the oppoſite ridge of hills, made it neceſſary to build an aqueduct acroſs for their conveyance. This aqueduct, diſtant ſix miles from the city, about two miles in length, and proportionably broad, is an edifice of three ſtories of arcades, of which the upper one is divided into 43 arches; the two lower ones, on account of the declivity of the hills and contraction of the valley, conſiſt of fewer. From hence the waters are carried in a channel to the caſcade near the royal gardens, and paſs under the city. The pavement of this aqueduct is formed of calcareous ſtone, with which the neighbouring mountains abound; and the remainder of the edifice is conſtructed with volcanic tufa, in which are intermixed ſome pieces of enamel. Sir William Hamilton informs us, that in the environs of Caſerta, below a ſtratum of vegetable earth four or five feet in thickneſs, we meet with cinders, pumices, and fragments of lava; and that in digging near the foundation of the aqueduct volcanic earths are diſcovered. Spallanzani (ſee his Travels, vol. i.), on examining the adjacent country, found that it was wholly calcareous, not excepting the higheſt mountains, almoſt all of which were of the ſame contexture and colour with the chains of hills between Naples and Loretto. This place was at firſt a hamlet, built by ſome families that eſcaped from the ruins of Capua; and from the weakneſs of its ſituation it was called *Caſa erta*, dreary houſe. It now ſeems, ſays Swinburn (Travels in the Two Sicilies, vol. iii.), very likely to relapſe into its priſtine ſtate by the emigration of its inhabitants, drawn into the plain by the conveniences of the new city and the charms of its court. The monarchs of the country have lately expended large ſums in embelliſhing the environs of Caſerta, in planting groves, and building places of rendezvous for hunting. N. lat. 41° 5′. E. long. 15° 5′.

CASES *reſerved*, in the *Romiſh Policy*, are conſiderable ſins, the abſolution of which is *reſerved* by the ſuperiors to themſelves, or their vicars.

There are ſome caſes reſerved by the pope, and others by the biſhops: in convents ſome are reſerved by the chapter, &c. None but theſe, or their vicars, can abſolve in ſuch caſes; except at the article of death, when all reſerved caſes are abſolvable, by the ordinary.

CASH, in *Commerce*, the ſtock or ready money, which a merchant, or other perſon, has in his preſent diſpoſal, to negociate; ſo called from the French term, *caiſſe*, i. e. *cheſt*, or *coffer*, for the keeping of money. M. Savary ſhews, that the management of the caſh of a company is the moſt conſiderable article; and that whereon its good or ill ſucceſs chiefly depends.

Cash-*book*. See Book.

CASHAN, in *Geography*, a populous and wealthy city of Perſia, in the province of Irak-agemi; ſituate about 98 miles N. of Iſpahan, in a large plain near a high mountain, which being oppoſed to the ſouth is ſo much affected by the reverberation of the ſun's rays in ſummer as to be intolerably hot. The bazars and baths of this place are elegant ſtructures, and the royal inn founded by Abas the Great, in the ſuburbs, is the faireſt in all Perſia. Adjoining to it ſtands the royal palace, and oppoſite to it another, deſigned for lodging ambaſſadors. Cashan has various manufactures of all ſorts of ſilks, ſtuffs, and tiſſues of gold and ſilver. N. lat. 33° 40′. E. long. 51° 20′.

CASHEF, or Kiaschef, in the Turkiſh government, an officer who acts as lieutenant of the Bey, and who preſides over a town or village in Egypt, collecting the revenues and judging in ſmall cauſes; from whom an appeal lies to the bey. The authority of a caſhef is as arbitrary as that of a bey. See Bey.

CASHEL, in *Geography*, a mountain of the county of Galway, Ireland, in the barony of Ballinahinch, which is an important land-mark to thoſe wiſhing to enter Birterbui-bay.

Cashel, a city and poſt town of the county of Tipperary, Ireland, ſituated about three miles eaſt of the river Suire. It was anciently a place of great importance and the reſidence of the kings of Munſter, who are ſuppoſed to have had a houſe of ſtone on the rock in the fifth century. Cormac Mac Cullinan in particular, who was at the ſame time prince and biſhop of Caſhel, reſided here at the beginning of the 10th century. In 1172 Henry II. of England viſited this town, in which he received the homage of Donald O'Brien, king of Limerick, and held a ſynod by which the ſupreme lordſhip of Ireland was confirmed to him, and ſome eccleſiaſtical regulations were adopted. Caſhel was ſurrounded by a wall which, though now mouldering, ſeems, from two gates of tolerable workmanſhip yet remaining, to have been of better materials than the generality of ſuch encloſures. But its eccleſiaſtical ruins are thoſe for which Caſhel is chiefly diſtinguiſhed. The chief of theſe are on the celebrated rock of Caſhel, which is ſeen at a great diſtance and in many directions, and which of courſe has a very extenſive proſpect. The old cathedral appears to have been a large as well as handſome Gothic ſtructure, the dimenſion of the nave and choir from eaſt to weſt being about 200 feet. Some have ſuppoſed that it was the firſt ſtone building in Ireland, but this appears to be mere conjecture. Donald, brother of Morrough, king of Munſter, about 1086, is generally recorded as the founder of it, and his grant of lands was confirmed by king John, as appears from an old ſtatute. Sir James Ware, however, was of opinion that it was not built till about the time of the arrival of the Engliſh under Henry II. perhaps ſuppoſing with that prejudice which blinds many writers, that the Iriſh were incapable of raiſing ſuch a ſtructure. Cormac's chapel, the ruins of which join the cathedral, and which is 50 feet by 18, is a very curious ſtructure, of a ſtyle of architecture totally different from that of the cathedral, and ſuppoſed to have been built by Cormac, about 902, which would be near two centuries earlier. There is alſo on the rock near the eaſt angle of the north aiſle, a lofty round tower, which is 54 feet in circumference and is divided into 5 ſtories with holes for joiſts. This tower has a communication with the church by a ſubterraneous paſſage, which implies that it was uſed for ſome religious purpoſe. From its having been built of free ſtone, when the rock and all the other buildings upon it are limeſtone, Dr. Campbell infers its being of greater antiquity than the reſt. The whole rock was incloſed by a wall, within which was the reſidence of the archbiſhop; and it is ſuppoſed by Mr. Ledwich to have been a *Mandra*, or habitation of a great number of monks. The church being through age in a ruinous condition was repaired by Richard O'Hedian, archbiſhop, in 1420, and part of it was uſed as the metropolitan church till 1750, when it was prematurely unroofed by Alexander Price, and thus expoſed to the effects of the weather. In the unhappy civil war of 1641, the rock having been taken poſſeſſion of by lord Taaffe, was ſtormed by the earl of Inchiquin, and many perſons were put to death. Caſhel is a tolerably well built town, containing about 600 houſes, but without trade. There is a handſome market-houſe, a ſeſſions-houſe, the county infirmary, a charter-ſchool, and a barrack. The church is a new and neat ſtructure, and the archbiſhop's palace, though plain, is large and commodious. The city is governed by a mayor, recorder, and bailiffs, and it ſends a member to the imperial parliament. Diſtance S.W. from Dublin 77 Iriſh miles. N. lat. 52° 30′ 30″. W. long. 7° 5′. Dr. Beaufort. Campbell's Philoſophical Survey. Collectanea de Rebus Hibern. Ledwich's Antiquities, &c. &c.

Cashel, *Archbiſhoprick of*, in Ireland; chiefly confined to the county of Tipperary. It was founded or reſtored by Cormac Mac Cullinan at the beginning of the 10th century; was made an archbiſhoprick by cardinal Paparo, the pope's legate in 1152, and was united to Emly in 1568. The united ſees are very compact, extending 32 Iriſh miles in length, and 30 in breadth. There are in the union 155 pariſhes, which make 47 benefices, and have only 35 churches. The cathedral, which ſerves alſo for a pariſh church, is a large and handſome modern edifice, completed by archbiſhop Agar, who alſo eſtabliſhed a choir. The archbiſhop is primate of Munſter, and ranks next to the archbiſhop of Armagh and Dublin; his ſuffragans are the biſhops of Killaloe, Limerick, Cork, Cloyne, and Waterford. Beaufort's Memoir.

Cashel, *Pſalter of*, an hiſtorical poem, or rather a collection of poems in the Iriſh language, written by Cormac Mac Cullinan, prince and biſhop of Caſhel, about 902. This Cormac is mentioned by Caradocus Llancarvanenſis in his Chronicle of Wales; and was ſlain in battle in 908 either by the Leinſter forces, or by the Danes. He is repreſented to have been learned and well ſkilled in the Iriſh antiquities, and his pſalter is highly valued by many as an authentic record. It has not been publiſhed, but part of it, at leaſt, is ſaid to be in the Bodleian library, and has been ſeen by reſpectable writers. Extracts from it have been publiſhed, and it is often referred to for the events of ſome centuries preceding. Stillingfleet and Pinkerton have, however, perhaps too raſhly, affirmed it to be a collection of poetical fictions, compiled in the 13th century, an opinion adopted by Ledwich. Is it not probable that whilſt an unreaſonable ſtreſs has been laid upon its authority by the advocates of early Iriſh literature, the others have been influenced by a prejudice againſt this? Teſtimony is in favour of the authenticity of the work, and there does not ſeem to be any reaſon for calling it in queſtion on this occaſion, but an unwillingneſs to admit an Iriſh work of ſo early a period. As to the degree of credit ſuch a work is entitled to, admitting its authenticity, it ſeems to be ſuch as is uſually given to poetical records, in which the facts related are generally ſo mixed with fable, or ſo exaggerated, that it is very difficult to draw the line of diſtinction. Ware's and Ledwich's Antiquities of Ireland. Nicholſon's Hiſtorical Library, &c.

CASHENDAL Bay, called alſo the Red bay, and ſometimes confounded with Cuſhendon bay, which lies a little north of it; an inlet on the north-eaſt coaſt of Ireland, in the county of Antrim, where a ſhip may ſtop in moderate weather, above two cables length from the ſhore on from three to nine fathoms water. White limeſtone is found near this part of the coaſt. N. lat. 55° 4′. W. long. 5° 54′. Hamilton's Antrim. M'Kenzie.

CASHEW-nut, in *Botany*. See Anacardium.

CASHGAR, anciently Casia, in *Geography*, formerly a remarkable town of Little Bucharia, giving name to a conſiderable kingdom, the limits of which nearly correſponded with thoſe of Bucharia. This town, though fallen from its ancient ſplendour, ſtill retains ſome commerce. See *Little* Bucharia.

Mr. Rennell has taken great pains to inveſtigate and aſcertain the poſition of Caſhgar; and he obſerves, as the reſult of his inquiry, that Caſhgar, Koten, &c. by their known ſituation with regard to Samarcand, muſt bear to the weſt, rather than to the eaſt, of north from Caſhmere; and alſo that the ridge of mountains, (the Imaus of the ancient geographers,) on the weſt of Caſhgar, Koten, and Karia, can be no other than that which ſeparates thoſe countries from Little Thibet and Badakſhan, and that joins on the ſouth to Caſhmere. By a mean deduced from the tables of Abulfeda, Ulug Beig, and Naſereddin, Caſhgar is about 7° 30′ of longitude eaſt of Samarcand; and of courſe 2° W. of Caſhmere. The parallel of Caſhgar, given in the tables, is 44°, which would place it nearly N.E. from Samarcand. That it bears conſiderably to the north of eaſt from Samarcand is ſtrongly implied by the direction of the roads, which lead to it, from Samarcand and Bokhara; that of the former being through Cogend and Andegan, (or Ferganah,) both of which lie to the north-eaſt of Samarcand; the former at ſeven, and the latter at 11 days' journey from it. From Bokhara, the road to Caſhgar lies through Taſhkund, ſtill more northerly than Cogend. Hence, if the direction of the road be north-eaſt for 11 days out of 25, the diſtance of Caſhgar from Samarcand, and 14 out of 30 from Bokhara, nearly N.E. by N., it furniſhes a ſtrong preſumptive proof that the direction of the whole line is very far to the north of eaſt. The only line of diſtance that will aid us in aſcertaining the latitude of Caſhgar is that given by Bernier, (vol. ii. lett. 9.) in which it is ſtated, that the diſtance of Caſhgar from Caſhmere is 44 journies, through Little Thibet; but that a ſhorter road lay through Great Thibet; and theſe journies, though not ſo expreſſed, may be underſtood to be thoſe of a caravan. Such journies, ſays Mr. Rennell, on a diſtance that requires 44 days of travelling, cannot, *in any country*, be taken at more than 14 geographical miles of direct diſtance each day; and through ſuch countries as thoſe between Caſhmere and Caſhgar, perhaps at 11 or 12 only. The diſtance, according to this proportion, would reach to the parallel of 42° 45′; on a ſuppoſition that 7½ or 8 degrees of longitude were allowed between Samarcand and Caſhgar; but even if 9 or 10 were ſuppoſed, the bearing line from Caſhmere is ſo nearly meridional, that two degrees of longitude would make a difference of a few minutes only in the latitude aſſigned to Caſhgar. Hence it may be generally inferred, that Caſhgar cannot be in a lower parallel than 42¾°; and then, admitting either of the diſtances from Samarcand (between 7½ and 10 degrees of longitude,) the bearing would be from E.N.E. to E.N.E. ½ N. Strahlenberg places it in 42½° latitude, and at 2½° of longitude W. of Caſhmere; M. Petis de la Croix (in Timur, b. iii. c. 7.) in 43°; M. d'Anville went into extremes, and placed it in 40° only. Admitting then that the capital of Caſhgar is ſituated in or about the parallel of 42¾°, we ſhall find that its diſtance from Samarcand and Bokhara, according to the report of the Orientaliſts, is conſiſtent with the difference of longitude, given in their tables. From ſeveral eſtimates of the rate of travelling by Sherefeddin and Aſtley, the difference of longitude between Samarcand and Caſhgar is ſtated to be 7½°. Caſhgar, according to a paſſage cited by capt. Kirkpatrick from Shanawaz, is bounded on the north by the mountains of Moguliſtan, one extremity of which range reaches to Shâſh, (i. e. Taſhkund on the river Sihon, or Jaxartes,) and the other to Terfan, and from thence to the Calmuck country. On the weſt it is bounded by a long ridge of mountains, from which the Moguliſtan mountains branch out. To the eaſtward lie quickſand hills, foreſts, and deſerts. The ſouthern limit is not given. Hence it appears, that the northern frontier of Caſhgar is on a parallel, or nearly ſo, with the territory of Sháſh, which lies on the north of Cogend, and the capital of which is Taſhkund, ſituate in lat. 42½°, according to the tables of Abulfeda, Naſereddin, and Ulug Beig. The long ridge of mountains on the weſt is, of courſe, that which extends from the north of Caſhmere to a point beyond the heads of the Sihon, ſeparating, in that part, the countries of Caſhgar and Turkeſtan; which ridge, in Sherefeddin's Timur, is named "Karangoutac," and is reckoned, in a military point of view, inacceſſible. No doubt ought to remain, ſays Mr. Rennell, concerning the proximity of Caſhgar to Great Bucharia; when we have proved from the writings of Abul Fazil, and Abdul Humeed, that the S.W. extreme of Caſhgar joins to the N.E. quarter of Cabul; or, admitting that part to be no more than a nominal dependency of Caſhgar, the real territory itſelf is not likely to be very remote. Mr. Rennell is of opinion, that the capital of Caſhgar, as well as the mountains on the north of it, which, in d'Anville's map of Aſia, extend towards Acſou and Terfan, ought to be removed ſeveral degrees to the north-weſt, and to the neighbourhood of Al Shâſh; theſe being the mountains of Moguliſtan deſcribed by Shahnawaz. Thus a conſiderable change will be made in this part of our maps of Aſia. Strahlenberg's map of the Ruſſian empire is much more conſonant to the ideas of Shahnawaz; and includes alſo the Weſtern Tartary, and the courſes of the rivers Jihon and Sihon (*Oxus* and *Jaxartes.*) His mount "Muſart," which paſſes along the north of Caſhgar, and Moguliſtan in general, at the height of 43° and 44° of latitude, anſwers to the Moguliſtan mountains of Shahnawaz, and really joins to Shâſh on the weſt, having alſo the long ridge branching out, and forming the weſtern boundary of Caſhgar. On a general conſideration of Strahlenberg's map, Mr. Rennell obſerves, that Cabul, Caſhmere, and Caſhgar, although nearly right, in reſpect of each other, are from four to five degrees too far eaſt, in reſpect of the Caſpian Sea and Samarcand; and the head of the Irtiſh river is by ſeveral degrees too near to Caſhgar, even as the latter ſtands in the map. Hence it follows, that the ſpace between the Irtiſh and Caſhgar is, out of all proportion, contracted; whilſt Great Bucharia is too much extended. Rennell's Memoir, p. 197, &c. See Bucharia.

CASHIER, the *caſh-keeper*; he who is charged with the receiving and paying the debts of a ſociety.

In the generality of foundations, the *caſhier* is called *treaſurer.*

Cashiers *of the bank*, are officers who ſign the notes that are iſſued out, examine and mark them when returned for payment, &c.

CASHIN, in *Geography*, a river of the county of Kerry, Ireland, which having united the waters of the Brick, the Teal, and the Gale, falls into the mouth of the Shannon, about three leagues eaſt of Kerry-head. It has a very narrow channel between beds of ſand, and alſo a bar at its mouth, which can be croſſed only about high water, ſo that it is frequented by none but ſloops and ſmall veſſels. Smith's Kerry.

CASHLEH Bay, a tolerably large harbour in the county of Galway, Ireland, which has ſafe anchorage for veſſels, that draw not above nine or ten feet water. It is however viſited only by ſmugglers and fiſhermen. N. lat. 53° 13. W. long. 9° 32′. M'Kenzie.

CASHMERE, Cashmire, or Kashmir, a province of Aſia, ſituate at the northern extremity of Hindooſtan, northward of Lahore, and reſtricted to a valley of an oval form, ſurrounded by hills, which has its largeſt extent from S.E. to N.W., or more ſtrictly, from S.E. by E. to N.W. by W. Mr. Forſter reckons its dimenſions 80 Britiſh miles by 40. Mr. Rennell admits that the eſtimate of 80 miles for the length of the flat part of the valley, does not exceed the truth by more than a very few miles; for he ſays, that 74 or 75 can be clearly made out. But its breadth is ſuppoſed to be 50 miles, or more; for Heerapour, at the entrance of the valley from the ſide of Bember, or the ſouth ſide, is nearly 25 Britiſh miles acroſs from Sirinagur; and Lar, according to Bernier, is about as far from Sirinagur as Barehmooleh is, i. e. 27 Britiſh miles; but as Sirinagur does not lie directly between Heerapour and Lar, a conſiderable angle takes place, and may probably reduce the 52 miles to 50 in direct diſtance. In the Ayin Acbaree, Caſhmere is divided into two parts, viz. "Meraje" and "Kamraje," the former being the eaſtern part, and containing the diſtricts ſituated to the E., the S.E. and the N.E. of Sirinagur; and the latter, the weſtern part, containing the N.W. and S.W. diſtricts. On the ſouth-eaſt of Sirinagur, at ſome diſtance beyond the great circle of mountains that ſurrounds the valley of Caſhmere, is the diſtrict of Benhal. With regard to its general poſition, Caſhmere is bounded on the weſt by the diſtrict of Puckholi; on the S.W. by the territory of the Ghickers; on the S.E. and S. by that of Jummoo and Kiſhtewar; and on the E. by the river Chunaub. On the N.E. lies Great Thibet, ſeparated from it by the ſummit of mount Kantel; and on the N.W. is Little Thibet. Tradition reports, that the ſite of this valley was formerly a lake; nor is this at all improbable. It is ſuch an effect as might be expected, in every caſe where the waters of a river are incloſed in any part of their courſe by elevated lands: and with reſpect to the river Behut in the preſent inſtance, it appears that the lake exiſted long enough to depoſit a vaſt depth of ſoil before it diſperſed. The Caſhmerian hiſtory names the lake "Sutty-Sirr;" and adds, that Kuſhup led a colony of Bramins to inhabit the valley, after the waters had ſubſided. Caſhmere, previouſly to the Mahometan conqueſt of India, was celebrated for the learning of its Bramins, and the magnificent conſtruction of its temple. Although we are not able to aſcertain the period of its ſubjection to the Mahometans, yet it is reaſonable to ſuppoſe, that a country ſupplying articles of valuable commerce, and furniſhing a profuſion of natural beauties, would at an early date have attracted their notice, and invited their conqueſt. It was governed for a long ſeries of years by a race of Tartar princes of the Jagatay or Zagathay tribe, until the year 1586, when it was ſubdued by Acbar, more, as it is ſaid, by intrigue than the force of arms. After having been annexed to the houſe of Timur for 160 years, it was betrayed by the Mogul governor to Ahmed Shah Duranny, who formed it into a province of the Afghan empire. Caſhmere is tributary to the ſultan of Cabul, and at the period of Mr. Forſter's reſidence, (A.D. 1783,) it was governed, or rather deſolated, by his viceroy. See CANDAHAR.

The valley, or country of Caſhmere, is celebrated throughout Upper Aſia for its romantic beauties, the fertility of its ſoil, and the temperature of its atmoſphere. Nor is its excellence in theſe reſpects to be queſtioned, when we conſider that it is an elevated and extenſive valley, ſurrounded by ſteep mountains that tower above the regions of ſnow; and that its ſoil is compoſed of the mud depoſited by a capital river, which, as we have already ſaid, originally formed its waters into a lake, that covered the whole valley, until it opened itſelf a paſſage through the mountains, and left this fertilized valley an ample field to human induſtry, and to the accommodation of a happy race; for ſuch the ancient inhabitants of Caſhmere undoubtedly were. The author of the Ayin Acbaree dwells with rapture on the beauties of Caſhmere; and on this account it was viſited by Acbar and by other emperors of Hindooſtan, who during the ſummer heats uſed to retire thither for the ſake of enjoying a cool and refreſhing climate, and who ſeemed to forget the anxieties of government during their reſidence in this "happy valley," "this garden in perpetual ſpring," "this paradiſe of India," as it was denominated by the multitude of its admirers. It appears that the periodical rains which almoſt deluge the reſt of India, are ſhut out of Caſhmere by the height of the mountains, ſo that only light ſhowers fall there; and yet theſe are ſo abundant as to feed ſome thouſands of caſcades, which are precipitated into the valley from every part of the ſtupendous and romantic bulwark that encircles it. The ſoil is the richeſt that can be conceived; and its productions are thoſe of the temperate zone. As it has generally a flat ſurface, copiouſly watered, it yields abundant crops of rice, which is the common food of the inhabitants. At the baſe of the ſurrounding hills, where the land is higher, wheat, barley, and various other grains are cultivated. A ſuperior ſpecies of ſaffron is alſo produced in this province, and iron of an excellent quality is found in the adjacent mountains. But the wealth and fame of Caſhmere have been chiefly owing to its manufacture of ſhawls, which are unrivalled, and which are diſtributed all over the weſtern and ſouthern parts of Aſia. The delicate wool of which theſe ſhawls are made, is the produce of a ſpecies of goat, either of that country, or of the adjoining one of Thibet. It is originally of a dark grey colour, and is bleached in Caſhmere by the help of a certain preparation of rice flour. The yarn of the wool is ſtained with ſuch colours as may be judged the beſt ſuited for ſale, and after being woven the piece is once waſhed. The border, which uſually diſplays a variety of figures and colours, is attached to the ſhawl after fabrication; but in ſo nice a manner, that the junction is not viſible. The texture of the ſhawl reſembles that of the ſhaloon of Europe, to which it has probably communicated the name. The price of an ordinary ſhawl, at the loam, is eight rupees; and thence, in proportional quality, it produces from 15 to 20; and ſome have been ſold at 40 rupees the firſt coſt. But the value may be very much enhanced by the introduction of flowered work; and hence the weaver occaſionally receives for a ſingle ſhawl the ſum of 100 rupees. Theſe ſhawls uſually conſiſt of three ſizes, two of which, the long and the ſmall ſquare one, are in common uſe in India; the other, long and very narrow, with a large mixture of black colour in it, is worn as a girdle by the northern Aſiatics. A portion of the revenue of Caſhmere is tranſmitted to the Afghan capital in ſhawl goods. The manufacture, however, is declined to one-fourth of the former quantity; which may be aſcribed to the decline of the Perſian and Hindooſtanic empires. In this diſtrict are ſheep, called "hundoo," which, like thoſe of Peru, are employed in carrying burdens. A wine is made in Caſhmere reſembling that of Madeira; and a ſpirituous liquor is alſo diſtilled from the grape, in which, as well as the wine, people of all claſſes freely indulge. The Caſhmirians fabricate the beſt writing paper of the Eaſt, which was formerly an article of extenſive traffic; as were alſo its lacquer ware, cutlery, and ſugars; but the heavy oppreſſions of the government, and the rapacity of the bordering ſtates, which prey upon the foreign traders and often plunder whole cargoes, have reduced the commerce of Caſhmere to a declining and languid ſtate. In proof of this fact, the Caſhmirians ſay, that during their ſubjection to the Mogul dominion, the province contained 40,000 ſhawl looms, and that at this day there are not 16,000. In Caſhmere are ſeen merchants and commercial agents of moſt of the principal cities of northern India, alſo of Tartary, Perſia, and Turkey, who at the ſame time advance their fortunes, and enjoy the pleaſures of a fine climate and a country, over which are profuſely ſpread the various beauties of nature. The country is plentifully watered by a number of ſtreams and rivers, which bring their tribute to the *Behut*, (which ſee,) the parent of the ſoil; and many lakes are ſpread over the ſurface, ſome of which contain floating iſlands. The whole country indeed reſembles a garden interſperſed with towns and villages, varied with beautiful trees, green meadows, fields of rice, hemp, ſaffron, and different legumes, and interſected by canals winding through them in all forms. The ſcenery is in a high degree pictureſque; and a portion of the romantic circle of mountains forms a part of every landſcape. The pardonable ſuperſtition of the ſequeſtered inhabitants has multiplied the places of worſhip of Mahadeo, of Biſhen, and of Brama. Caſhmere is altogether holy land; and it abounds with miraculous fountains. However, they are obnoxious to one dreadful evil, which is the frequent recurrence of earthquakes; and in order to preſerve themſelves from their injurious fatal effects, all their houſes are built of wood, which the country ſupplies in great abundance. The annual public revenue of Caſhmere, in the time of Aurungzebe, appears to have been only about 35,000l.; in the time of Shah Ivan the actual and realized revenues were about 25,000l.; and only 20,000l. in the time of Mahomed Shah. A revenue, ſays Forſter, of between 20 and 30 lacs of rupees is collected from this province, of which a tribute of ſeven lacs is remitted to the treaſury of Timur Shah. The army of Caſhmere conſiſts of about 3000 horſe and foot, chiefly Afgans, who are poorly paid, and who for want of better ſubſiſtence were under a neceſſity of living on the kernel of the ſingerah, or water-nut, which is plentifully produced in the lakes of this country. The dreſs of the Caſhmirians conſiſts of a large turban, a great woollen veſt with wide ſleeves, and a ſaſh wrapped in many folds round the middle; under the veſt, which may be properly called a wrapper, people of the higher claſs wear a pirahun, or ſhirt, and drawers; but thoſe of the lower order have no under garment, nor do they even gird up their loins. The dreſs of the women is no leſs aukward than that of the men. Their external, and often only garment is of cotton, and ſhaped like a long looſe ſhirt; over the hair, which falls in a ſingle braid, they wear a cloſe cap, uſually of woollen cloth of a crimſon colour; and to the hinder part of it is attached a triangular piece of the ſame ſtuff, which falling on the back conceals much of the hair. Around the lower edge of the cap is rolled a ſmall turban, faſtened behind with a ſhort knot, which ſeems to be the only artificial ornament about them. The women of the higher claſs are never ſeen abroad. The Caſhmirians are ſtout, well-formed, and as the natives of a country lying in the 34th degree of latitude, may be termed a fair people; and their women in ſouthern France and Spain would be called brunettes; but their figure is coarſe, their features broad, and their legs often thick. They are generally gay and lively, and much addicted to pleaſure, although the Afghan government has ſomewhat depreſſed their ſpirit. Young and old have a taſte for muſic. Mr. Rennell ſays they have a language of their own, ſaid to be anterior to the Sanſcrit; but according to Mr. Forſter, it is evidently derived from the Sancrit, and reſembles in ſound that of the Mahrattas, though more harſh; on this account the inhabitants compoſe their ſongs in the Perſic, or adopt thoſe of the Perſian poets. They ſeem to have a religion of their own, different from that of the Hindoos. Abul Fazil ſays "the moſt reſpectable people of this country are the Reyſhees, who, although they do not ſuffer themſelves to be fettered by traditions, are doubtleſs true worſhippers of God." Mr. Forſter ſays, that he never knew a national body of men more impregnated with the principles of vice than the natives of Caſhmere. Eager in purſuit of wealth, ambitious in ſeeking aggrandizement, arrogant and rapacious, and yet ingenious in deviſing and multiplying modes of luxurious expence; deceitful and treacherous; fickle in friendſhip and implacable in enmity:—ſuch is the diſguſtful picture which Mr. Forſter has exhibited of the diſpoſition and manners of the Caſhmirians. Thus, the numerous train of deſpicable vices engendered and nouriſhed by ſlavery are here exhibited in frightful deformity; and a land, which nature formed for a terreſtrial paradiſe, is converted by man into a region of ſorrow, of penury, and of carnage. Forſter's Travels, vol. i. and ii. Rennell's Memoir.

CASHMERE, CACHEMIRE, or CASHMIR, the capital of the above province, called alſo *Sirinagur*, is ſituated N. ¼ W. from Lahore, at the diſtance of 151 geographical miles, by the route of Bember. This city extends about three miles on each ſide of the river Behut, or Ihylium, which has a remarkably ſmooth current throughout the whole valley, the country being flat and the body of water very large; and it occupies in ſome parts of its breadth, which is irregular, about two miles. Over the river are four or five wooden bridges, connecting the ſeparate parts of the city. The houſes, many of which are two or three ſtories high, are ſlightly built of brick and mortar, with a large intermixture of timber. On a ſtanding roof of wood is laid a covering of fine earth, which ſhelters the building from the great quantity of ſnow that falls in the winter ſeaſon. This fence communicates an equal warmth in winter, and a refreſhing coolneſs in ſummer; when the tops of the houſes, which are planted with a variety of flowers, exhibit at a diſtance the ſpacious view of a beautifully chequered parterre. The ſtreets are narrow, and choaked with the filth of the inhabitants, who are proverbially unclean. No buildings are ſeen in this city that are worthy of remark; though the Caſhmirians boaſt much of a wooden moſque, called the "Jumah Muſſid," erected by one of the emperors of Hindooſtan; but its claim to diſtinction is very moderate. The lake of Caſhmere, long celebrated for its beauties, and for the pleaſure which it affords to the inhabitants of this country, extends from the N.E. quarter of the city, in an oval circumference of five or ſix miles, and joins the Ihylum by a narrow channel near the ſuburbs. Among the innumerable gardens which border the lake, the moſt conſpicuous is that which was conſtructed by Shah Iehan, called the "Shalimar," where nature and art ſeem to have vied which ſhould contribute moſt to its decoration. N. lat. 34° 20′ 30″. E. long. 73° 44′.

CASHNA. See KASSINA.

CASHOO, a medicinal and aromatic drug which is reckoned among perfumes. All that has yet been aſſerted about the origin and compoſition of this drug, is entirely fabulous. What follows will ſufficiently acquaint phyſicians, apothecaries, and druggiſts with what they ought to know of it. Caſhoo is extracted from a tree which is called *catee* in the country where it grows, which is a province of Hindooſtan, called Bahar, the capital of which is Patna. See BAHAR. Caſhoo is properly an extract made by a decoction and maceration of the ſeveral parts of this tree, and rendered ſolid by evaporation. There are two ſorts of ſimple caſhoo, the rough, and the purified or refined; the latter is a compoſition of purified caſhoo, mixed with aromatic drugs, and made into lozenges. This caſhoo is made for the uſe of the Indians, who chew it either alone, or mixed with pinang or areca. Rough caſhoo is a commodity which is brought down the Ganges as far as Bengal; whence it is diſtributed throughout the Indies, where there is a great conſumption of it; and to the Europeans, who ſend it into Europe. What is ſent into Europe, however, is moſtly purified; for caſhoo is not uſed rough any where.

Caſhoo is much valued in medicine: among other effects aſcribed to it, is the ſtopping a cough, and ſtrengthening the ſtomach; beſide which it ſweetens the breath, when, being reduced to an impalpable powder, mixed with ambergriſe, and mucilages of gum adragant, it is made into paſtils. Caſhoo muſt be choſen of a tanned red on the outſide, of a bright red within, very ſhining, and not burnt. Kœmpfer obſerves, that they prepare at Odowara perfumed caſhoo, of which they make pills, ſmall idols, flowers, and other figures, which they put into little boxes for ſale. The women are very fond of it, and uſe a great deal of it, becauſe it faſtens the teeth, &c. The thickened juice is carried to Japan, by the Dutch and Chineſe; and after it has been prepared at Macao, or at Odowara, they buy it again, and carry it to other places.

CASI, in the *Perſian Policy*, one of the two judges under the nadab, who decide all religious matters, grant all divorces, and are preſent at all public acts; having deputies in all cities of the kingdom.

CASIA, in *Botany*, *fructu nigro*, Amm. Ruth. See Nitraria *ſchoberi*.

Casia *poetica monſpelienſium*, Cam. Epit. Lob. Ic. 432. *Monſpelii dicta*, Geſn. Epit. 50. *Latinorum*, Alp. Exot. 41. See Osyris *alba*.

Casia, in *Ancient Geography*, a country which the ancients placed near mount Imaus in Scythia. M. D'Anville places it in the angle formed towards the weſt by the two chains of mountains, which he calls Imaus, one of which is to the north-eaſt, and the other declining to the ſouth-eaſt. This country correſponds to the preſent *Caſhgar*; which ſee.

Casia, a promontory on the coaſt of Carmania, at a ſmall diſtance from the mouth of the river Hydriacus.

CASIAR, or Cæsarea, in *Geography*, a town of Aſia, on the coaſt of the Mediterranean, in Paleſtine; anciently called Cæsarea-*Stratonis*, which ſee. In the year 635, it was taken by Omar, one of the ſucceſſors of Mahomet, and was alternately in the poſſeſſion of the Chriſtians and Mahometans during the religious wars, till it was finally left, with the loſs of its ancient ſplendour, in the power of the latter.

CASII, or Cassii *Montes*, in *Ancient Geography*, a chain of mountains in Aſia, ſituate in Serica, to the ſouth of Aſmiræa, and of Iſſedon Serica, according to Ptolemy.

CASILINUS, a river of Italy, in Campania. The town of Caſilinum was ſeated on the oppoſite banks of this river, and a bridge connected its two parts. Agathias ſays, that this river deſcended from the Apennines, and diſcharged itſelf into the Tyrrhenian ſea.

CASILINUM, a town of Italy, in Campania, N.W. of Capua, ſeated on the Vulturnus, at a conſiderable diſtance from the ſea. It once occupied both ſides of the river. During the ſecond Punic war it diſtinguiſhed itſelf by the reſiſtance which its garriſon made to Hannibal. Julius Cæſar eſtabliſhed a colony in this place. Modern Capua was built on its ruins. See Capua.

CASIMERSBURG, in *Geography*, a town of Germany, in the circle of Upper Saxony, and duchy of Pomerania; 14 miles E.N.E. of Colberg.

CASIMIR, in *Biography* and *Hiſtory*, the name of ſeveral kings of Poland.

Casimir I. was the ſon of Mieczlaus II. and at the death of his father, in 1034, was placed under the tutelage of his mother, Rixſa, who was appointed regent of the kingdom. The Poles, aggrieved by her oppreſſive adminiſtration, revolted, and expelled both her and her ſon. Caſimir took refuge in France, and, having a propenſity to literature, ſtudied in the univerſity of Paris; and, aſſuming deacon's orders, he became a monk, firſt in Italy, and afterwards in the abbey of Cluni, in France. Poland, having ſuffered much during the interregnum, the nobles of the country diſcovered the place of Caſimir's retreat, and recalled him from his exile; but it was neceſſary that he ſhould be releaſed from his clerical vows; for which purpoſe, a diſpenſation was obtained from the pope, on condition of the payment of Peter-pence by the Poles, and ſome other ſtipulations favourable to the holy ſee, and he was then crowned with unuſual ſolemnity, in 1040. By marrying the ſiſter of Jariſlaus, grand duke of Ruſſia, he ſecured peace from that quarter; and by the vigour of his government, he ſuppreſſed the banditti who had infeſted the country, and reſtored law, order, cultivation, and proſperity to Poland. He civilized his ſubjects by the eſtabliſhment of churches and monaſteries, and by encouraging the arts of peace he made his kingdom flouriſh to a degree before unknown. In 1044, he quelled the rebellion of Maſlaus, who had riſen from the rank of a private ſoldier to the higheſt offices of the ſtate, and who at laſt aſſumed the title of prince of Mazovia. He alſo expelled the Bohemians from Sileſia, and eſtabliſhed an epiſcopal ſee at Breſlaw. After an honourable and happy reign of 18 years, he died, in 1058, much regretted, and left the crown to his ſon Boleſlaus.

Casimir II. ſurnamed *the Juſt*, was the youngeſt ſon of Boleſlaus III. who, at the death of his father, in 1123, was left an infant in the cradle, without any proviſion. In mature age, he was advanced to the dignity of prince of Sandomir; and, as an evidence of the propriety with which the appellation of *Juſt* was beſtowed upon him, the following anecdote is recorded. Having won at play all the money of one of his nobility, the loſer, incenſed at his ill fortune, ſtruck the prince a blow on the ear. The offender inſtantly fled; but being purſued and taken, he was condemned to loſe his head. Caſimir interpoſed. "I am not ſurpriſed," ſaid the prince, "that, not having it in his power to revenge himſelf on Fortune, he ſhould attack her favourite." He revoked the ſentence, returned the nobleman his money, and declared that he alone was faulty, as he had encouraged, by his example, a pernicious practice, that might terminate in the ruin of his people. The Poles, diſſatiſfied with the conduct of his brother Mieczlaus III., depoſed him, and elevated Caſimir to the throne, in 1177. The new ſovereign proved himſelf worthy of the honour, by ſubduing the Lower Poland and Pomerania, aboliſhing all exorbitant impoſts, reforming the abuſes of his predeceſſor's adminiſtration, and reſtoring rights and privileges that had been alienated from their poſſeſſors. The brother of Caſimir, deprived of his crown, and reduced to a ſtate of extreme indigence, ſupplicated compaſſion; and ſo far ſucceeded, that the reigning prince determined to evacuate the throne in his favour, and pledged himſelf for his future good conduct; but the ſtates, to whom Caſimer applied for permiſſion to reſign, peremptorily refuſed it. He connived, however, at the irregularities of his brother, and particularly at his taking forcible poſſeſſion of Gneſna and Lower Poland, where he might have lived in ſplendour and in peace. But his reſtleſs ſpirit led him to extend his encroachments, and he perſiſted in his endeavours to wreſt the crown from his brother. It became neceſſary, at length, to reſtrain his uſurpations; and to compel him to evacuate all his conqueſts. The laſt enterpriſe of this prince was a kind of pious cruſade againſt the relapſed heathens of Pruſſia, whom he ſubdued rather by the reputation of his wiſdom and generoſity than by force of arms. Soon after his return to Cracow from this expedition, he died, in 1194, after a reign of 17 years, lamented as the moſt amiable prince that had ever filled the throne of Poland. With his diſtinguiſhed virtues, however, he blended culpable foibles. In his palace he was the ſlave of his miſtreſſes.

**Casimir III.** ſurnamed *the Great,* ſucceeded his father Uladiſlaus III. in 1333, and ſoon after his acceſſion engaged in a conteſt with the Teutonic knights, who obtained the ſupport of the kings of Bohemia and Hungary. His ſubjects wiſhed him to vindicate his claims and to puniſh the uſurpation, perfidy, and turbulence of theſe knights, by declaring war againſt them; but Caſimir, ſenſible of their power, thought it moſt prudent to wait for a more ſeaſonable opportunity, and acquieſced in the reſtitution of Culm and Cujavia. At this time he had another more important object in view than that of regaining Pomerania, which had been adjudged by the royal umpires to the knights; and this was the conqueſt of the province called Black Ruſſia, which, together with Volhinia and Mazovia, he completely ſubdued and annexed to his Poliſh dominions. Having accompliſhed this object, he directed his attention to the civilization and improvement of his country. Accordingly, he firſt gave the Poles a regular code of written laws, ſuch as had never before been ſeen in Poland, which he cauſed to be obſerved by all ranks of people, and he thus introduced juſtice and order in the room of arbitrary deciſion and undefined extortion. This written code he preſented to a general diet, where it was examined, approved, and enlarged. He alſo ſtrengthened the frontiers of the country by fortreſſes, incloſed the chief cities of his dominions with walls, built churches, founded monaſteries, and purſued every meaſure that was likely to conciliate the affection and attachment of his ſubjects, and to increaſe the wealth and proſperity of the kingdom. His incontinence caſt a cloud over his other virtues; and he incurred peculiar reproach by ſhutting up one of his wives in a monaſtery that ſhe might not interrupt his licentious intercourſe with a favourite concubine. His works of piety and charity recommended him to the favourable judgment of the clergy; and they not only extenuated the criminal indulgence of his ruling paſſion, but laviſhed upon him the higheſt encomiums. He was thrice married, but left no children; he was the laſt Poliſh king of the direct line of the Piaſti. His death, which happened in 1370, at the age of 60 years, and after a reign of 37, was occaſioned by a fall from his horſe in hunting.

**Casimir IV.** the ſecond ſon of Jagello, was grand duke of Lithuania, when, in 1445, his brother Uladiſlaus was killed in the battle of Varna againſt the Turks, and was crowned as king of Poland, in 1447.

The firſt operations of his reign were directed againſt Bogdan, who uſurped the vaivodeſhip of Moldavia, whom he obliged to ſue for peace. He afterwards undertook the protection of the Pruſſians againſt the tyranny of the Teutonic knights, whom he expelled from many of their cities. But whilſt his army covered the ſiege of Mariemburg, the knights attacked his camp with great impetuoſity, and conſtrained him to ſecure himſelf by an ignominious flight, after 4000 of his troops had been ſlain or taken priſoners. In conſequence of this defeat, he returned to Poland, and, having recruited his forces, he reſumed the ſiege of Mariemburg and took it; and thus humbled the knights to ſuch a degree, that, by a treaty of peace concluded at Thorn, they ceded the territories of Culm, Michlow, and the whole duchy of Pomerania, together with the towns of Elbing, Mariemburg, Talkmith, Schut, and Chriſtburg, to the crown of Poland. The king, in return, reſtored to them all his other conqueſts in Pruſſia; granted a ſeat in the Poliſh ſenate to the grand-maſter; and indulged him with other privileges, on condition that ſix months after his acceſſion, he ſhould do homage for Pruſſia, and take an oath of fidelity to the king and republic. Such were the conditions on which Caſimir terminated the war, and humbled an order which had given perpetual diſturbance to the northern hemiſphere, for nearly the ſpace of two centuries. Moldavia was alſo made tributary to Poland; and when the crown of Bohemia became vacant, the barons beſtowed it upon Uladiſlaus, the eldeſt ſon of Caſimir, in oppoſition to the intrigues of Matthias Corvinus, the king of Hungary, whom Uladiſlaus purſued into his own country, and defeated. Thus the three crowns of Poland, Hungary, and Bohemia, were united in the ſame family, and Caſimir's power was greatly augmented, though the felicity of his people, oppreſſed with grievous taxes, and diminiſhed in number by a variety of bloody engagements, did by no means increaſe in the ſame proportion. Caſimir wiſhed to retrieve his domeſtic affairs by the arts of peace; but before he could accompliſh his purpoſe, he died, at the age of 64, in the year 1492, more admired than beloved or regretted. In this reign the deputies of the provinces firſt appeared at the diet, and aſſumed to themſelves the legiſlative power; all laws before this period having been framed by the king, in conjunction with the ſenate. Caſimir is alſo ſaid to have publiſhed an edict, enjoining the ſtudy of the Latin tongue, in which both he and his ſubjects were before groſsly ignorant, and thus he rendered this language ever ſince almoſt vernacular among the gentry of Poland.

**Casimir, John,** ſecond ſon of Sigiſmund III. king of Poland, was originally deſtined for the church, and entered the ſociety of the Jeſuits, after having viſited moſt of the courts of Europe. From pope Innocent X. he had obtained a cardinal's hat: but upon the death of his brother Uladiſlaus VII. in 1648, the Poles elected him to the crown. Upon his acceſſion he expreſſed his diſapprobation of the meaſures which had irritated the Coſſacks and excited them to rebel; and, after ſome actions with them, he concluded a treaty of peace which was much in their favour. Afterwards the war was renewed; the Coſſacks were defeated, and again obtained a peace, which occaſioned diſſatisfaction to the nobility. In 1653, the Ruſſians availed themſelves of the hoſtile diſpoſition of the Coſſacks, and of the diviſions that ſubſiſted between Caſimir and the Poliſh nobility, to commence hoſtilities againſt Poland; and, uniting with the Coſſacks and Tartars, entered Lithuania, ravaged the country, and treated the inhabitants with great barbarity. At the ſame time Charles Guſtavus, king of Sweden, invaded Poland by the way of Pomerania, and, reducing the whole country as he advanced, with Cracow its capital, obliged the unfortunate Caſimir to ſeek an aſylum in Sileſia. Caſimir's flight being interpreted by the Poles as an abdication of the crown, they took an oath of allegiance to the conqueror; and Guſtavus became maſter of all Poland and Pruſſia, the city of Dantzic excepted. The impoſitions of the Swedes, aided by the exhortations and example of the clergy, rouzed again a ſpirit of reſiſtance. Caſimir was privately invited to return to his dominions; and he immediately put himſelf at the head of a conſiderable army, aſſembled by the nobility. The Tartars formed an alliance with the Poles, and, attacking a body of Swedes, totally defeated them. The Lithuanians alſo revolted from the Swediſh monarch, and taking advantage of the diſperſed condition of his ſoldiers, attacked and maſſacred them before they could unite and form themſelves into a body for their own defence. Guſtavus, however, proſecuted the war, and took Warſaw by ſtorm; but at length he was obliged, in 1657, to withdraw his army from the Poliſh territories, and to employ it in the defence of his own country, which was attacked by the Danes. Soon afterwards the Swedes were under a neceſſity of wholly evacuating Poland. After the death of Guſtavus, Caſimir made a peace at Oliva, in 1660, with Charles XI. his ſucceſſor, upon condition that he ſhould renounce all claim to the Swediſh crown, and that the Swedes ſhould reſtore all their conqueſts in Poland, Pruſſia, and Livonia, Riga and a few other places excepted. Peace being thus eſtabliſhed between the Poles and the Swedes, Caſimir determined to commence a war with the Ruſſians, who had made divers incurſions into his dominions; and having ſucceeded in two deciſive engagements, he laid ſiege to Wilna, the capital of Lithuania, which had been taken by the enemy during the late war with Sweden. The ſiege was protracted till diſſenſions occurred between the king and ſome of the nobility, who inſiſted that he ſhould diſmiſs his German mercenaries, under a plea that they were introduced to deſtroy the liberties of the republic, and not to recover her territories. The animoſity produced an open variance; forces were raiſed on both ſides; a battle enſued; the royal party was defeated; and the conteſt terminated with the diſmiſſal of the German levies. Upon this compliance on the part of Caſimir, the diſcontented party threw off the maſk, loſt all reſpect for the perſon of the king, and occaſioned to him ſo much vexation, aggravated at the ſame time by the loſs of his wife, who had been his brother's widow, that he reſigned the crown in diſguſt, A. D. 1668, and retired to France, where he was honourably received and hoſpitably treated by Lewis XIV. He died at Nevers, in December, 1672, and a magnificent monument was erected for him at the church of the abbey of St. Germain des Prez, of which he was abbot. The turbulent reign of John Caſimir gave riſe to the privilege aſſumed by each ſingle nuncio at the diet, of putting a ſtop to any public affair by his negative, called the "liberum veto:" a fruitful ſource of anarchy and violence. Mod. Un. Hiſt. vol. xxx. Moreri.

**Casimir, Matthias Sarbievski**, a Poliſh Jeſuit, and an excellent Latin poet, was born in 1597; and, in the judgment of M. Baillet, he is an exception to a general maxim of Ariſtotle and others among the ancients, which teaches us to expect nothing ingenious and delicate from the northern climates. His odes, epodes, and epigrams, have been thought not inferior to ſome productions of the fineſt wits of Greece and Rome. Grotius, D. Heinſius, and others, have not ſcrupled to affirm, that he is not only equal, but ſometimes ſuperior, even to Horace himſelf. Such was the reſpect which he entertained for Virgil, that he had begun to imitate him in an epic poem, called the "Leſciade," which he had divided into 12 books. But his death, which happened at Warſaw in 1640, put a ſtop to his progreſs in this work. His epigrams, however, are allowed to be much inferior to his odes. We have a tranſlation of one or two of his ſmall pieces in Dr. Watts's lyric poems. There have been many editions of his poems, the beſt of which is that of Paris in 1759.

**Casimir**, in *Geography*, a town of Poland, on the Viſtula, on the ſide oppoſite to that of Cracow, from which it is only ſeparated by a bridge, built by king Caſimir the Great, for an univerſity, which contains 11 colleges and 14 ſchools.

**CASINATES**, in *Ancient Geography*, the inhabitants of the town of Caſinum, which ſee.

**CASING**, among *Hunters*, denotes the ſtripping off the ſkin of a hare, fox, or badger. They ſay, *flay* a deer, *caſe* a hare, and all ſorts of vermin. This is done by beginning at the ſnout or noſe of the beaſt, and ſo turning his ſkin over his ears down to the body, and the very tail.

**Casing** *of Timber-work*, is the plaſtering of a wooden houſe all over on the outſide with mortar, and ſtriking it, yet wet, by a ruler, with the corner of a trowel, or the like inſtrument, to make it reſemble the joints of free-ſtone; by which means, the whole houſe appears as if built thereof. It is beſt done on heart-laths, becauſe the mortar is apt to decay the ſap-laths in a ſhort time. It is commonly laid on at two thickneſſes, the ſecond before the firſt is dry.

**CASINGS**, a provincial term applied to dried cow's dung, which is uſed in ſeveral parts for fuel.

**CASINO**, in *Geography*, a river of Italy, which runs into the ſea, 2 miles N.W. of cape Stilo.

**CASINUM**, in *Ancient Geography*, a conſiderable town of Italy, in Latium, upon the Latin way from Campania. Hannibal encamped two days under its walls. After the wars of the Samnites, under the conſulate of M. Valerius and Publius Decius, the Romans, having made themſelves maſters of Caſinum, ſent a colony thither in the year of Rome 442. Its ruins are viſible near San. Germano.

**CASINUS**, a river of Italy, which, according to Strabo, joined the Liris at the place where was ſituated the town of "Interamna." It is ſuppoſed to have been the preſent *Sacco*.

**CASIORUM Insulæ**, ſmall iſlands ſituate near the ſmall iſland of Caſus, to the ſouth of the iſland of Carpathus.

**CASIROTÆ**, a people of Aſia, who inhabited the territory N. of Aria, on the ſide of Drangiana, according to Ptolemy.

**CASIUS**, the name of two mountains of Phœnicia, one to the ſouth, on the frontiers of Egypt, the other to the north, near "Seleucia Pieriæ," to the right of the mouth of the Orontes. The term "Caſius," in the Eaſtern language, denotes limit or boundary, and the ſituation of theſe mountains, in their relation to Phœnicia, juſtifies this etymology. The mount Caſius of Syria (ſee Pliny, N. H. l. v. c. 22.) was ſituated to the ſouth of the mouth of the Orontes, near Seleucia to the ſouth-weſt. The preſent mount Caſius riſes above Antioch to a prodigious height; but Pliny ſurpaſſes hyperbole when he ſays that from its ſummit we may diſcover at once both the morning's dawn and the evening twilight. The mount Caſius that lay on the frontiers of Syria and Egypt is ſituated on the northern coaſt of the iſthmus of Suez, and was diſtant, according to Strabo, 300 ſtadia from Peluſium. According to this geographer (l. xvi. vol. ii. p. 1102.) it reſembled heaps of ſand, and projected into the ſea. On this mountain the body of Pompey the Great was depoſited, and it had a temple of Jupiter, named *Caſius*. Jupiter has alſo a temple, under this appellation, on mount Caſius in Syria, near Seleucia, as is evident from the reſort of the inhabitants thither every year to celebrate a feaſt in honour of Triptolemus. He was alſo worſhipped under this title at Caſſiope, a city in the iſland of Corcyra, ſituate on the weſternmoſt cape of the iſland, and neareſt the main land. Suetonius repreſents Nero as landing on this point, and ſinging before the altar of Jupiter Caſius. There are medals ſtill extant, which exhibit Jupiter with theſe inſcriptions, "ZEYC KACIOC," and "ΖΕΥΣ ΚΑΣΙΟΣ," expreſſive of this title.

Casius, a river of Aſia in Albania, mentioned by Pliny and Ptolemy; and the mouth of which is placed by the latter between thoſe of Gherius and Albanus.

CASK, in French *Caſque*, a head-piece or helmet, a defenſive armour for covering the head and neck. Formerly all the gens d'armes of France wore *caſques*. The king had one gilt with gold, the dukes and counts had theirs with ſilver, gentlemen of extraction wore them of poliſhed ſteel, and the reſt of plain iron. The word is commonly ſuppoſed to come from *caſſis*, the Latin term for a helmet.

The Romans had their caſques of braſs or iron, which were proof againſt the ſtrokes of any ſword or ſabre, and were ornamented to the height of two feet with plumes of feathers, or tufts of horſe hair, of different colours, which made them look grander and taller, and ſtruck more terror into their enemies. The chiefs and principal officers wore caſques gilded and enriched with precious ſtones, with the tops of them ornamented with plumes and aigrettes of value, which ſerved to diſtinguiſh them from others. The Scandinavians, and other people of the north, uſed to wear them, and the invention of them is aſcribed by ſome to the Scythians and the Celts. It is ſuppoſed, however, to have been one of the moſt ancient of all coverings for the head, and it is frequently ſeen on ancient medals in a variety of forms or faſhions, as the Grecian, the Roman, &c. Kings and emperors wore it; and even the gods themſelves are figured as wearing it. That which covers the head of Rome, has generally two wings, like thoſe of Mercury. Thoſe of ſome kings are furniſhed with horns, like thoſe of Jupiter Ammon, whilſt thoſe of ſome others have only bulls' or rams' horns, to denote their uncommon ſtrength.

Cask, in *Heraldry*, the ſame with helmet.

Cask is alſo uſed as a common name for veſſels of divers kinds; in contradiſtinction from the liquor, or other matter contained therein. Thus a hogſhead of ſpirits, &c. is ſaid to weigh 4 Cwt. ½ and 22lb. caſk and liquor; a puncheon, 6 Cwt. ¼ and 2lb. caſk and liquor. See Tun, &c.

Cask *of Sugar*, is a barrel of that commodity, containing from eight to eleven hundred weight.—A caſk of almonds is about three hundred weight. No one ſhall tranſport any wine caſk, &c. except for victualling ſhips, under a certain penalty, by 35 Eliz.

For the method of eſtimating the ſolidity or content of a caſk, ſee Frustum *of a Pyramid*, and Gauging.

CASKET, in a general ſenſe, a little coffer, or cabinet. See Cabinet.

CASKETS, in *Geography*, two high rocks at W. by N. and W.N.W. from the W. end of Alderney, beſides many ſmaller ones, ſeveral of which are covered by the flood-tide. On the weſternmoſt of the Caſkets there are three light-houſes, diſpoſed in a triangular form. N. lat. 49° 45′ 30″. W. long. 2° 24′ 40″. High water at ſpring-tides at 9 o'clock. See Alderney.

Caskets, in *Sea-Language*, are ſmall ropes made of ſinnet, and faſtened to gromets, or little rings upon the yards; their uſe is to make faſt the ſail to the yard when it is to be furled.

Caskets, *breaſt*, are the longeſt and higheſt of theſe, or thoſe in the midſt of the yard, betwixt the ties.

CASLEU, in the *Hebrew Chronology*. See Cisleu.

CASLON, William, in *Biography*, an eminent letter-founder, was born at Hales Owen in Shropſhire, in 1692; and having ſerved an apprenticeſhip to an engraver of ornaments on gun-barrels, he embarked for himſelf in this buſineſs in London, connecting with it the manufacture of tools for the book-binders, and for the chaſing of ſilver plate. Whilſt he was thus engaged, he became acquainted with the elder Mr. Bowyer, who introduced him to a foundery; and being ſatisfied of his abilities for undertaking the buſineſs of cutting types, though he had never before ſeen it performed, he concurred with two other eminent printers (Mr. Bettenham and Mr. Watts) in advancing the ſum of 500l. towards enabling him to commence the undertaking. Accordingly he immediately applied to it with ſingular aſſiduity and ſucceſs. In 1720, the ſociety for promoting Chriſtian knowledge propoſing to print, for the uſe of the Eaſtern churches, in Paleſtine, Syria, Meſopotamia, Arabia, and Egypt, where printing was not allowed, the New Teſtament and Pſalter in the Arabic language, engaged Mr. Caſlon to cut the fount of letter; in his ſpecimens of which he diſtinguiſhed it by the name of "Engliſh Arabic." Having finiſhed this fount, he cut the letters of his own name in "Pica Roman," and placed them at the bottom of one of the Arabic ſpecimens. When Mr. Palmer, the reputed author of the "Hiſtory of Printing" (which was in fact written by Pſalmanazar), ſaw the name, he adviſed the artiſt to cut the whole fount of Pica; in the execution of which he ſurpaſſed the other founders of the time. Mr. Palmer afterwards repented of the advice he had given him, and dreading the competition of ſuch a formidable rival, endeavoured to diſcourage his farther progreſs. Mr. Caſlon, diſguſted by this treatment, applied to Mr. Bowyer, and under his inſpection he cut, in 1722, the beautiful fount of "Engliſh" which was uſed in 1726, in printing Selden's works, and the Coptic types that were made uſe of for Dr. Wilkins's edition of the Pentateuch. Under the farther encouragement of his three firſt patrons, he proceeded with vigour in his employment, acknowledging his particular obligation to Mr. Watts as his maſter, from whom he had learned his art. Such was the perfection to which he attained, that it was no longer neceſſary to import types from Holland; and his own were ſo beautiful and elegant, and ſo far exceeded the productions of the beſt artificers, that they were frequently exported to the continent. A more beautiful ſpecimen than his, it has been juſtly ſaid, is not to be found in any part of the world. After ſome previous changes of habitation, he at length, viz. in 1735, eſtabliſhed his foundery in Chiſwell-ſtreet, where in proceſs of time it became the moſt capital of any exiſting in this or in any foreign countries. Having acquired opulence in the courſe of his employment, he was introduced into the commiſſion of the peace for the county of Middleſex; and towards the cloſe of his life, devolving the active part of his buſineſs on his eldeſt ſon, he retired to Bethnal green in the vicinity of London, where he died in January 1766 at the age of 74 years. Mr. Caſlon was univerſally eſteemed as a firſt-rate artiſt, a tender maſter, and an honeſt, friendly, and benevolent man; and ſir John Hawkins (Hiſt. of Muſic, vol. v.) has particularly celebrated his hoſpitality, ſocial qualities, and his love of muſic. Biog. Brit.

CASLUHIM, in *Scripture Geography*, one of the nations deſcended from Mizraim, who are ſuppoſed to have ſettled ſomewhere towards the entrance of Egypt, about mount Caſius, in that part of the Lower Egypt called Caſiotis by Ptolemy and others, which places, it is thought, retain ſome likeneſs of the name; but, without relying on that argument, they appear to have been planted near the Caphtorim, becauſe the Philiſtines ſeem to have been deſcended from both theſe people, and conſequently to have been ſettled in Egypt. Bochart, miſled by following the Jewiſh notion about Caphtor, fancies them to be the inhabitants of Colchis, at preſent called Mingrelia.

CASMA, in *Ancient Geography*, a town mentioned by Ptolemy, and placed in the eaſtern part of Mauritania Cæſarienſis between Aquæ Calidæ and Bida.

Casma La Barca, in *Geography*, a town of South America, in the country of Peru, and juriſdiction of Santa. *Caſma*, or *Cazma* port is 4 leagues N. from Morgon, and 11 S.E. from Ferrol, on the coaſt of Peru, in the South Pacific Ocean. S. lat. about 9° 40′. This is a good harbour, though ſubject to hard gales.

CASMENA, a town of Sicily, placed by ſome near the ſource of the Hippatis, and by others between Acræ and Camarina. This city, according to Thucydides (l. vi. c. 25.) was built by the Syracuſans 90 years after Syracuſe, or about the year 668 B C.

CASMONATES, a people of Italy, who inhabited the mountains of Liguria. Pliny.

CASOAR, in *Ornithology*, the French name of the caſſowary (Buff.) See Struthio Casuarius.

CASOLI, in *Geography*, a town of Naples, in the province of Abruzzo Citra; 15 miles S.S.E, of Civita di Chieta.

CASOS, or Casus, Casso, an iſland of the Mediterranean, one of the Cyclades, is ſaid to have received its name from Caſo, the father of Cleomachus. This little iſland ſent a colony to mount Caſius, dependent on Syria. According to Strabo, it is diſtant from Carpathus, now called Scarpanto, 70 ſtadia or 2½ leagues, and 250 ſtadia, or 9 leagues, from Samonium, a promontory of Crete. It is 80 ſtadia, or 3 leagues, in circumference; on it was formerly a town of the ſame name, which no longer exiſts, and round it are ſeveral ſmaller iſlands. The population of this iſland at the preſent time is not conſiderable; and entirely compoſed of Greeks, though ſubject to the Turks. It is little frequented by ſhipping, its road being difficult of entrance, and its ſhore dangerous of acceſs. The inhabitants, however, are on that account more happy and more free; as the Turks ſeldom venture to go thither to exerciſe the deſpotiſm with which they oppreſs the countries ſubject to their dominion. The Greeks of Caſſo, being more independent and more ſecure in their property, are more laborious than others; their toil and induſtry have introduced fertility on a ſoil of which the ſtratum even of vegetable earth, which covers the rocks, appeared not to render it ſuſceptible; the vines which grow on this ſtony ground, furniſh them with very good wine; and the honey, which they gather, is ſtill, as in ancient times, abundant, and of an excellent quality. The Caſſiots, like all the inhabitants of the ſmall iſlands which cannot ſupply the wants of their population, are navigators and traders; but their induſtry in that way does not extend beyond the limits of the Archipelago. The women of the iſland wear a jacket, ſaſh, and long robe of cotton; the only difference conſiſting in the embroidery, which varies according to their different taſtes, and in the manner of wearing their hair, which ſome ſuffer to flow upon their ſhoulders, in one or more treſſes, and others faſten to the crown of the head, letting it fall down again upon the neck. Their employment is that of ſpinning cotton and embroidering, and making the fine linens which they wear. Several of them are handſome, and their amuſements are dancing and muſic. The men, during the ſpring, ſummer, and part of autumn, are out at ſea, ſo that the iſland ſeems to have few males. Theſe trade to different iſlands of the Archipelago, and return from time to time with proviſions for their families, and only paſs the winter with them. They ſow the land with barley and wheat at the commencement of the rainy ſeaſon, which laſts from October to February; collect the harveſt in March, and then return to ſea, ſupplying from other countries the deficiency of the produce of their own iſland. The cultivated part of the iſland is divided into compartments, and ſhared among the Caſſiots. The rain is not continual in the above-mentioned months, but none falls in any other; during the remainder of the year the air is pure and ſerene, and both days and nights fine and clear. The heats are moderated by the ſea-breezes, and beneath a beautiful ſky, the inhabitants enjoy a delightful temperature, and are almoſt ſtrangers to every kind of diſeaſe. The men enjoy their repaſts, conſiſting of poultry, eggs and rice, and good wine, dining together ſeated in a circle on the carpet, and the women in a ſeparate apartment. Savary expreſſes his admiration of the regularity and wiſdom of this little republic, the peace and harmony that prevailed among its members, and, above all, that cheerfulneſs and content which was ſo viſible in their countenances. "In the midſt of ſlaves crouching beneath the Ottoman yoke, I have found," ſays this writer, "a rock only 3 leagues in circumference, on which the Turk dares not ſet his foot, and inhabited by a free and happy people. There each father of a family is a ſovereign within his own houſe; he decides every difference, and his decrees are laws, which cannot but be equitable, ſince they are only dictated by paternal tenderneſs. When any diſputes ariſe, the prieſt and the old men aſſemble, and decide them; but diſputes cannot be frequent among citizens, who are all equal and alike unacquainted with poverty or riches. All the members of this little ſociety are employed; and I have ſeen the handſomeſt of their women go down into the valley, to waſh their linen at the fountain, as in the days of Homer. They cheer their labours with a ſong; nor do they imagine themſelves diſgraced by their humble employment." Several iſlets or ſhoals lie near the northern coaſt of the iſland of Caſſo, called by the ancients the Caſſian iſlands; they are barren, and ſcarcely covered with a few buſhes; but they ſhelter the road of Caſſo from the winds and the ſea to the north.

CASPARGUS, in *Ichthyology*, a name given by Salvian, from Ælian, to a fiſh ſuppoſed to be of the Sparus genus, and probably the *Sparus annularis* of modern naturaliſts; it is deſcribed as being of a plain yellowiſh colour, with a large annular (ocellated) ſpot near the tail, which perfectly agrees with Sparus annularis.

CASPASIUS, or Caspasium *flumen*, in *Ancient Geography*, a river placed by Pliny in Aſiatic Scythia.

CASPATYRUS, or Caspapyrus, a town of Aſia, placed by Herodotus (l. iii. c. 52.) in Pactya, upon the Indus; but by Hecatæus, cited by Steph. Byz. in Ganderia, in the vicinity of the Sogdians and Bactrians, and ſouth of theſe people. The modern name of this town, according to M. d'Anville, is Tchupareh.

CASPE, in *Geography*, a town of Spain, in Arragon, ſituate at the conflux of the Guadaloupe and the Ebro. The adjacent country produces corn, wine, oil, and ſaffron. Here Ferdinand IV. was elected king of Arragon; 44 miles S.E. of Saragoſſa, and 35 S. of Balbaſtro.

CASPEAN, or Beautiful, a ſmall lake of North America, in Greenſborough, Vermont. On its weſtern ſide is Hazen blockhouſe. It is a head-water of La Moille river.

CASPERIA, in *Ancient Geography*, a town of the Sabines, mentioned by Virgil; towards the ſouth-eaſt of Reate. It is called *Caſparula* by Silius Italicus, l. viii. v. 416.—Alſo, a country of India, on this ſide of the Ganges, below the ſources of the Bidaſpe, Rhoas, and Sandubal, according to Ptolemy.

CASPHIN, or Casphis, a ſmall but well fortified town of Paleſtine, in the tribe of Dan, ſeated on a ſmall lake about 6 miles E. of Jamnia. It was fenced with high walls, and ſo well provided within, at the time of the Maccabitiſh wars, that the inhabitants, truſting to their own ſtrength, threw out many ſcornful ſarcaſms on the Jewiſh army; but Judas Maccabæus aſſaulted it with ſuch unexpected bravery, that he made himſelf maſter of it, and put all the inhabitants to the ſword, inſomuch that a neighbouring lake, about 2 furlongs broad, was ſeen running with blood. 2 Maccab. xii. 12—16.

CASPIÆ Pylæ, or Portæ, an important defile between the mountains and the Caſpian ſea. See Caspian *Gates*.

CASPIAN Sea, in *Geography*, a detached ſea of Aſia, which has no viſible connection with any of the great oceans, nor apparent outlet, and which, on this account, ſome writers have claſſed among the larger lakes, not thinking that it properly deſerves the appellation of a ſea. It is bounded on the north by the province of Aſtrachan and the Caucaſus, and on the ſouth, eaſt, and weſt, by different provinces of Perſia. The governments of Uſimſk and Caucaſus border on the Caſpian. It was anciently called by the Greeks the Hyrcanian, i. e. the Perſian, Sea; by the Tartars it is denominated Akdinghis, or the White Sea; by the Georgians it is termed the Kurtſhenſkian Sea; and the Perſians denominate it Gurſen, from the old Perſian capital, Gurgan, which is ſaid to have ſtood in the province of Aſtrabad, only ſeven verſts from the ſea. It reaches in length about 10 degrees, from about the 37th to the 47th degree of north latitude, or about 680 miles from Gurief to Medſhetiſar, and in breadth from 100 to 260 miles, where it is the wideſt. Its ſuperficial contents amount to above 36,000 ſquare Engliſh miles.

The ancient geographers were very imperfectly acquainted with this ſea, and have given very unfounded and abſurd deſcriptions of it. According to Strabo, (lib. xi. p. 773.) the Caſpian is a bay, that communicates with the Great Northern Ocean, from which it iſſues at firſt by a narrow ſtrait, and then expands into a ſea, extending in breadth 500 ſtadia. With him Pomponius Mela (lib. iii. c. 5.) agrees, and deſcribes the ſtrait by which the Caſpian is connected with the ocean as conſiderable in length, and in breadth ſo narrow, that it had the appearance of a river. Pliny (N. H. l. vi. c. 13.) gives a ſimilar deſcription of it. In the age of Juſtinian, this opinion concerning the communication of the Caſpian Sea with the ocean was ſtill prevalent. Some early writers, by a miſtake ſtill more ſingular, have ſuppoſed the Caſpian Sea to be connected with the Euxine. Quintus Curtius (l. vii. c. 7.) has adopted this error. Arrian, (l. v. c. 26.) though a more judicious writer, and who by reſiding for ſome time in the province of Cappadocia, as governor, might have obtained more accurate information, declares in one place, that the origin of the Caſpian Sea was ſtill unknown, and expreſſes a doubt whether it was connected with the Euxine, or with the Great Eaſtern Ocean which ſurrounds India. Theſe errors appear more extraordinary, as Herodotus, near 500 years before the age of Strabo, had given a juſt deſcription of this ſea. "The Caſpian," he ſays (lib. i. c. 203.) "is a ſea by itſelf, unconnected with any other. Its length is as much as a veſſel can ſail with oars in 15 days, and its greateſt breadth as much as it can ſail in eight days." Ariſtotle (Meteorol. l. ii.) deſcribes it in the ſame manner, and with his uſual preciſion contends, that it ought to be called a great lake, not a ſea. Diodorus Siculus (vol. ii. l. xviii. p. 261.) concurs with them in opinion. Ptolemy, however, maintained its communication with the Euxine, affirming that the waters of both had a ſubterraneous connection; as, otherwiſe, it was not to be explained how ſo many large rivers ſhould flow into the Caſpian; for, which there was not one channel out of it. What, it might be ſaid, becomes of the waters of the Volga, the Yaik, the Yemba, the Kur or Cyrus, the Araxes, the Byſtrai, the Akſa, the Koiſa, the Terek, and the numberleſs others that flow into it? By the ſun alone they cannot be evaporated; there is no viſible outlet for them; and yet the ſea is never perceptibly ſwollen, except merely in the Spring on the melting of the ſnows. See this ſubject diſcuſſed by captain Perry in his ſtate of Ruſſia, p. 100, &c. printed at London in 1716. Thoſe who have recourſe to ſubterraneous paſſages, by which its water muſt flow into the Perſian ſea, or more probably into the Euxine, allege two arguments in ſupport of their opinion. In the firſt place they ſay, that the Caſpian riſes very high with a weſterly wind; whereas the Euxine, on the contrary, rages moſt when the wind is at eaſt: conſequently, the eaſt wind favours the exit of the waters of the Caſpian, and the weſt wind impedes it. But this is one of thoſe fallacies, denominated by logicians, "Cauſa pro non cauſa:" all the winds that bring humid vapours with them are more ſtormy than thoſe which proceed from arid regions. But the weſt wind comes hither from the Euxine and the Palus Mœotis; and conſequently the Caſpian muſt neceſſarily be put into more vehement agitation by it. Secondly, it is pretended, that this ſea has a whirlpool, which, with a horrid noiſe, ſwallows up all the ſuperfluous water, and diſcharges it into the Euxine. In proof of this, it is farther urged, that a ſpecies of ſea-weed, growing only on the ſhores of the Caſpian, is found at the mouth of this tremendous vortex. To which they add, that near to this vortex is a ſort of fiſh, which is only caught in the Euxine; and laſtly, that in former days, a fiſh was taken in the Caſpian ſea, with a golden ring about its tail, on which was this inſcription; "Mithridates mihi dabat in urbe Sinope libertatem et hoc donum." See Kircher's Mundus Subterraneus, lib, ii. c. 13. But later accounts are ſilent with regard to a whirlpool; the fiſhes ſaid to be found only there and in the Euxine are yet to be more accurately deſcribed; and the ſtory from Kircher has very much the air of a fiction. Sea-weed grows every where on the ſhores of this ſea, from Aſtrachan to Sulak, and thence again to the Muganian Steppe. Upon the whole, therefore, we may conclude, that the eſcape of the waters of the Caſpian into the Euxine is an ungrounded hypotheſis. Seleucus Nicator, indeed, the firſt and moſt ſagacious of the Syrian kings, at the time when he was aſſaſſinated, entertained thoughts of forming a junction between the Caſpian and Euxine ſeas by a canal, and of thus extending the trade of his ſubjects in Europe and ſupplying all the countries in the north of Aſia, on the coaſt of the Euxine Sea, as well as many of thoſe which ſtretch eaſtward from the Caſpian, with the productions of India; but his ſcheme failed. See Canal. None of the ancient authors above cited have determined whether the greateſt length of the Caſpian was from north to ſouth, or from eaſt to weſt. In the ancient maps that illuſtrate the geography of Ptolemy, it is delineated, as if its greateſt length extended from eaſt to weſt. In modern times, the firſt information concerning the true form of the Caſpian, which the people of Europe received, was given by Anthony Jenkinſon, an Engliſh merchant, who with a caravan from Ruſſia travelled along a conſiderable part of its coaſt in the year 1588. The accuracy of Jenkinſon's deſcription was confirmed by an actual ſurvey of that ſea made by order of Peter the Great, A.D. 1718; when it was found to be in length about 1100 verſts from the mouth of the Ural to the coaſt of the Moſanderan; its greateſt width from the mouth of the Terek to the extremity of the bay of Mertvoï

Kultyuk being 8°, rather more than 700 verſts. At its ſouthern extremity, from the point of Lenkeron to the peninſula, ſituate at the mouth of the bay of Balkan, it is 6°, ſomewhat more than 525 verſts, and at its greateſt width 2° 35′, or 225 verſts. Its circumference, comprehending the great gulfs, but excluding the little ſinuoſities, is 4180 verſts.

The Caſpian is ſuppoſed at a former period to have extended further to the north, where the deſerts are ſtill ſandy and ſaline, and preſent the ſame ſhells that are found in the Caſpian; but the chain of mountains which branches from the weſt of the Ural to the north of Orenburg, and reaches to the Volga, muſt, in all ages, have reſtricted the northern bounds of the Caſpian. In the eaſt this ſea is generally ſuppoſed to have extended at no very remote period to the lake of Aral; the deſerts on that ſide preſenting the ſame features as thoſe to the north, though now an elevated level lies between the ſea of Aral and the Caſpian, occaſioned perhaps by the quantity of ſand rolled down by the Gihon, the Sirr, and other rivers which now flow into the ſea of Aral. The coaſts of the Caſpian northward, from the Terek towards the weſt, as far as the eaſtern extremity of the bay of Mertvoï Kultyuk, are low, flat, ſwampy, and overgrown with reeds; the water too is ſhallow. On the other ſhores from the Terek to the deſert of Korgan near Aſtrabad, and from the northern part of the bay of Balkan to that of Mertvoï Kultyuk, the country is mountainous, the ſhores bold, and the water very deep. The ground in many places, not far from the ſhore, is ſo deep that a line of 450 fathoms will not reach it. This ſea is the receptacle of many large rivers, as the Emba, or Yemba, the Ural or Yaik, and the Volga from the north; the Kuma, Terek, Kur, and Kizil Ozen from the weſt; thoſe from the ſouth are inconſiderable: but from the eaſt it is ſuppoſed ſtill to receive the Tedjen; and of the rivers that were formerly ſuppoſed to diſembogue into it, ſeveral do not exiſt, ſuch are the Jaxartes and the Oxus (Gihon), which were pretended to flow hither from the eaſt; the latter, in particular, is ſaid to have flowed into it by one or two branches, till it bent northward and joined the ſea of Aral. Some writers have reported, as a ſtriking peculiarity of the Caſpian, that during 30 or 35 years, its waters are conſtantly increaſing, and then for the ſame term continually decreaſe; but this report is not confirmed by any ſtated obſervations. This ſea has no regular flux or reflux; and, on account of ſhoals, it is navigable only by veſſels drawing from 9 to 10 feet of water: it has ſtrong currents, and, like all inland ſeas, is ſubject to violent and dangerous ſtorms, which the Ruſſian veſſels, badly conſtructed, weather with difficulty. The water is in general ſalt, though not in all places, particularly in thoſe where the large rivers empty themſelves into it.

The Caſpian has been obſerved to remain equally full; the true reaſon of which is perhaps to be ſought in the quality of its bottom; which conſiſts, not of a thick ſlime, but of a ſhell-ſand, the particles of which, touching only in few points, render it very porous. Of the ſame ſubſtance the whole ſhore is likewiſe formed. Layer upon layer it lies three fathoms deep. This indeed lets the freſh water through, but it becomes immediately ſalt again by means of the ſalt water that preſſes upon it. Through this ſand the water is filtered, and falls into the abyſs beneath in the ſame quantity which flows into the ſea. In the bay of Emba, above the river Yaik, the reverſe is ſeen. The water there is not let through; it therefore ſtagnates, and even the fiſhes putrefy. Its exhalations are extremely noxious. The wind that blows over this bay has been known to come on with ſuch ſurpriſing force as to throw down the ſentinels of the Ruſſian forts, erected here, with ſo much violence as to kill them. In this ſea there is a conſiderable number of iſlands, which are moſtly ſandy. The Caſpian abounds with a great variety of fiſh. The ſalmon is as good as that of Riga and Archangel, and even more fleſhy and fat. The herrings too are remarkably large, and plumper than the Engliſh and Dutch, but not ſo tender. To theſe we may add the ſterlet, two kinds of ſturgeon, ſeals and porpoiſes. The birds moſt generally ſeen in the vicinity of this ſea are ſtorks, herons, bitterns, ſpoonbills, red geeſe, red ducks, and many others. The moſt beautiful of theſe is the red gooſe, which, though ſo called, is white, with the tips of the wings, the orbits of the eyes, the beak and feet, ſcarlet. It is about the ſize of a ſtork, has a long neck and high legs, is very ſavoury to the taſte, and lives on fiſh. It may be denominated "Ciconia, vel Ardea, roſtro adunco lato brevi." A ſpecies of red wild ducks is alſo frequent, which fly in the evening to the tops of the trees or the roofs of houſes, where they perform a noiſy concert. Their fleſh is well-taſted, not oily, though, like other water-fowl, they feed on fiſh. The leeches here are of two kinds, the hog-leech and the dog-leech. Their holes have two apertures, one towards the ſouth and the other facing the north, which they open and ſhut according to the change of the wind. On the ſhore, between Terki and Derbent, grows a graſs on which all the quadrupeds feed with avidity: to the horſe alone the eating of it is fatal. They die upon the ſpot. Peter the Great is ſaid to have cauſed an experiment to be made in his preſence, and the common report was found to be true.

The ports of the Caſpian may be divided into Ruſſian, Perſian, and Tartar. The Ruſſian ports and trading places are Aſtrakhan, Gierief, and Kiſlar. The Perſian havens are Derbent, Niezabad, Baku, Einzellee, Farabat, Medſhetiſar, and Aſtrabad. The Tartar havens are the bay of Balkan and Mangufhiak. See each of theſe reſpectively.

The commerce of the Caſpian is of a very ancient date; though at preſent it is not ſo conſiderable as it might be made. The exports amount in value to about 1,200,000, and the imports to about 1,000,000 of rubles. The articles of exportation are nearly the ſame with thoſe that find purchaſers on the Euxine, (which ſee); and in return ſcarcely any thing is taken but ſilk.

In ancient times Egypt long enjoyed a monopoly of the commerce by ſea between the eaſt and weſt, and hence it derived that extraordinary degree of opulence and power for which it was conſpicuous. The kings of Egypt, by their attention to maritime affairs, had formed a powerful fleet, which gave them ſuch decided command of the ſea, that they could eaſily have cruſhed any rival in this kind of trade. The Perſians, however, though they carried on no commercial intercourſe at ſea with India, were no leſs deſirous than the people around them to poſſeſs its valuable productions and elegant manufactures; and accordingly theſe were conveyed to all the parts of their extenſive dominions by land-carriage. The commodities, deſtined for the ſupply of the northern provinces, were tranſported on camels from the banks of the Indus to thoſe of the Oxus, down the ſtream of which they were carried to the Caſpian Sea, and diſtributed, partly by land-carriage, and partly by navigable rivers, through the different countries, bounded on one hand by the Caſpian, and on the other by the Euxine Sea. The commodities, intended for the ſouthern and interior provinces, proceeded by land from the Caſpian gates to ſome of the great rivers, by which they were circulated through every part of the country. This was the ancient mode of intercourſe with India, while the Perſian empire was governed by its native princes. In the mean while the monarchs of Egypt were allowed to continue in the unmoleſted poſſeſſion of the trade with India by ſea: but though the ſovereigns both of Egypt and of Syria laboured with emulation and ardour to ſecure to their ſubjects all the advantages of the Indian trade, the power of the Romans, by a ſeries of revolutions, proved fatal to both. Having extended their dominion over Syria, they directed their victorious arms againſt Egypt, which was annexed to the Roman empire and reduced into the form of a Roman province by Auguſtus. As early as the 14th century the Venetians and Genoeſe, by means of the Caſpian, brought the Indian, Perſian, and Arabian commodities, with which they ſupplied the ſouthern parts of Europe, through Aſtrachan to their magazines at Azof and Caffa. From Aſtrachan the goods were conveyed up the Volga, then by land to the Don, and afterwards forwarded down that river to the Azof. The northern part of this continent was likewiſe ſupplied, through Aſtrachan, with Aſiatic goods, by the Ruſſian traders, who ſent them to their principal magazine at Wiſby, a Hanſeatic town in the iſle of Gothland. The devaſtations occaſioned by the wars of Timur or Tamerlane, towards the end of the 14th century, cauſed a transfer of this trade from Aſtrachan to Smyrna and Aleppo; and the Arabian commerce, more commodious for theſe parts, never returned to Aſtrachan; but part of the Perſian traffic was afterwards reſtored to its old channel. While the provinces of Caſan and Aſtrachan remained under the government of the Tartars, the camp of the khan was a mart for the Ruſſian and Perſian merchants. But as, agreeably to the cuſtoms of the Tartars, this was frequently changed, Aſtrachan and Terki became at length two principal places of reſort. This commerce, frequently obſtructed and interrupted by numerous banditti, was precarious; until the conqueſt of Caſan and Aſtrachan opened a ready communication between Moſcow and the Caſpian Sea; Ivan Vaſſilievitch II. having garriſoned Aſtrachan with troops, rendered it the chief emporium of the eaſtern trade. See ASTRAKHAN. This conqueſt being completed in 1554, ſoon after the diſcovery of Archangel, the Engliſh obtained the czar's permiſſion to paſs through his dominions into Perſia, and to carry on an excluſive trade over the Caſpian. In 1558, Jenkinſon, the firſt Engliſhman who navigated that ſea, landed at Manguſhlak upon the eaſtern ſhore, paſſed by land through the country of the Turcoman Tartars to Bokhara, capital of Great Bucharia, and returned to Moſcow in the following year. In 1561 he again ſailed over the Caſpian, and, proceeding to the coaſt of Shirvan, went by land to Caſbin, and obtained from the Sophy permiſſion to trade into Perſia. Several merchants followed his example. In 1597, Chriſtopher Burroughs conducted an expedition, which was attended with many dangers, and at length arrived at Aſtrachan. During theſe expeditions, the traffic was chiefly confined to the ports of Tumen, Derbent, Baku, and the coaſt of Ghilan. This infant commerce was much impeded by the banditti that frequent the ſhores of the Caſpian, and by the wars between the Turks and Perſians; and therefore during above a century and a half no Engliſh veſſel appeared upon this ſea. At length, in 1741, the Britiſh merchants of St. Peterſburgh, at the perſuaſion of captain Elton, an Engliſhman in the Ruſſian ſervice, renewed the commerce, and eſtabliſhed a factory at Reſhd in the province of Ghilan. In conſequence of ſome diſputes with the Ruſſians, he entered into the ſervice of Nadir Shah, and aſſiſted in conſtructing ſome veſſels on the Caſpian. This circumſtance gave umbrage to the court of St. Peterſburg; and Elizabeth, in 1746, withdrew her permiſſion to the Engliſh merchants of paſſing through her dominions for the Caſpian commerce. On the death of Nadir Shah, who, by Elton's influence, had permitted the Engliſh to trade to Perſia, their factory was pillaged by one of the pretenders to the throne, and their commerce annihilated.

The Ruſſians purſued, with perſeverance, the track opened by our merchants, and under Alexey Michaelovitch, Aſtrachan became the centre of the Perſian trade; to which place merchants from Bucharia, Crim Tartary, Armenia, Perſia, and even India, reſorted. By the rebellion of the Coſſacks of the Don, under Stenko Razin, and the devaſtations occaſioned by it, the trade of Ruſſia was annihilated. When this revolt was quelled, the greater part of the commerce fell into the hands of the Armenian merchants eſtabliſhed in Aſtrachan, who ſettled factories in both the Ruſſian and Perſian territories. During this whole period the Ruſſian and Armenian traders penetrated no further than Niezabad, a port between Derbent and Baku; and their chief ſettlement was at Shamakee, capital of Shirvan, until the year 1711, when that town was taken by the Leſgees, and the factory deſtroyed. In 1721, this commerce was renewed by Peter I. who obtained the ceſſion of the provinces of Dageſtan, Shirvan, Ghilan, and Maſanderan, on the eaſtern and ſouthern coaſts of the Caſpian. Soon afterwards he eſtabliſhed a Ruſſian mercantile company trading to the Caſpian; the whole capital of which conſiſted only of 400 achins or ſhares, of the value of 150 rubles or 30l. each. The chief ſettlements were formed at Aſtrachan and Kiſlar. As the poſſeſſion of theſe diſtant provinces was very expenſive, Anne reſtored them to the Sophy, on condition that the Ruſſian merchants ſhould enjoy liberty of trade to all the havens of the Caſpian without paying duty, be allowed to build houſes and magazines, and be ſubject to the laws of the country. The privileges of this company were confirmed by Anne and Elizabeth; but in 1762, Catharine II. aboliſhed the excluſive right of this company, and permitted all her ſubjects to trade with Perſia; prohibiting, on account of the numerous banditti that infeſt the roads, the inland traffic from Kiſlar, and the other Caſpian ports to Shamakee. Two Ruſſian conſuls reſide at Baku and Einzellee. The Armenian merchants, however, carry on a contraband trade, and from their knowledge of the country and language, underſell the Ruſſians. See ASTRAKHAN. In the year 1760, the exports and imports of the whole commerce, both by ſea and land, to and from the Caſpian Sea, amounted only to about 400,000 rubles; in 1768, to upwards of 800,000; and in 1775, to more than a million of rubles; without reckoning the contraband trade. At preſent it may be eſtimated at the ſame amount.

The fiſhery on the Caſpian is the moſt important branch of this buſineſs in Ruſſia. This is owing in a great meaſure to the excellent kinds of fiſh with which it abounds, to its commodious ſituation in the centre of the empire, facilitated by water communications, and the advantageous method in which this trade is proſecuted. Pallas obſerves, that the fiſhery on the Caſpian is in ſome reſpects as important to Ruſſia as the herring, the cod, and the whale fiſhery are to other maritime powers of Europe. The fiſhery on the northern or Ruſſian ſhores of the Caſpian is partly let out to merchants of Aſtrachan, whoſe great opulence is founded on it; and it partly belongs, in virtue of ancient privileges, to the Uralian Kozaks or Coſſacks. See ASTRAKHAN and URAL.

As the Caſpian is uſually free from ice towards the latter end of March, the fiſhery commences about the middle of March or beginning of April; and it is carried on by ſeveral contractors, each of whom has his particular ſtation or "vataga," commonly bearing the name of the proprietor. Every vataga is occupied by from 50 or 80 to 120 men, moſt of whom carry on a ſeparate trade; and here are alſo pilots, fiſhermen, ſalters, preparers of iſinglaſs and cavear, &c. The vatagas have alſo their own veſſels of various dimenſions and conſtructions; and near the habitations of the people that are employed are ſeveral ſheds, where the roes are prepared, the iſinglaſs dried, and the ſtock of fiſh kept in order. For preſerving the ſalted fiſh, deep and well-ſecured ice-cellars of conſiderable magnitude are dug under ground, and they are furniſhed with large reſervoirs, in which the freſh fiſh are pickled in a ſtrong brine. There are various other conveniences adapted to the neceſſary operations. The taxes paid by the vatagas to the crown are rated according to the quantity of prepared roes and iſinglaſs; and for every pood of iſinglaſs five rubles, but for a pood of roes two rubles 80 kopeeks are paid into the caiſſe. In autumn and winter only the beluga is caught, which then collect into the bays, either for paſſing the winter or to ſpawn. About the middle of March, when the ſea begins to be free from ice, myriads of little fiſh drive towards the ſhore; and of theſe the "obla," a ſort of ſcale-fiſh, is caught and kept alive in wells, in order to furniſh a ſupply for baiting the hooks while the ſeaſon laſts. This fry is followed by prodigious ſwarms of ravenous belugas; and whilſt this ſwarming laſts, a veſſel may bring up within 24 hours 50 of them and more. The beluga is caught by means of a machine conſiſting of a rope 70 ells in length, to which 125 lines of the length of $1\frac{1}{2}$ fathom each, with as many large angling-hooks, are tied. This rope with its hooks is technically termed a neſt, and 30 of theſe neſts tied together commonly belong to a machine, which is therefore ſeveral hundred fathoms in length. Between every two neſts a ſtone is tied of ſome pounds in weight, and the two ends of a whole machine are furniſhed with wooden anchors. The machine, when laid, is viſited twice a day, and the hooks cautiouſly taken up along the rope. Paſſing a rope through the gills of the fiſh brought up, they let them down again into the water in order to bring them on ſhore alive. Here they are dragged with hooks to the beach, which is laid with planks, and cut up in the following order: the lower part of the ſtomach, with the guts, is thrown away; the fleſhy gullet is ſalted for eating; the roe lies through the whole body adjoining to the entrails; this is taken out with the hands and caſt into tubs, in which it is carried away by the cavear-makers; then follows the ſloat or ſounds, which runs along the whole back, and is given to the iſinglaſs-makers. Laſtly, they cut off the cartilage of the back, in order to extract the dorſal ſinews, which are waſhed, hung upon poles, and dried in the air. The fiſh, being cleared of its entrails, the fat adhering about the melt and to the ſides is ſcraped away with knives, collected into tubs, boiled down, and cleanſed. This freſh fat, being of a good taſte, is uſed during the faſts inſtead of butter or oil. The cleanſed fiſh are at laſt brought into the cellar above deſcribed, pickled in brine, and then ſtrewed with ſalt, and laid up in courſes on each other. When the ſhoaling of the beluga has ceaſed, the train of ſevrugas comes on, which happens only once a year and laſts not much above two weeks. At one vataga, it is uſual, with a favourable ſea-breeze, to catch 16 and ſometimes 20 thouſand of theſe fiſh. The nets made uſe of for this purpoſe are ſo thick that the machines are only a ſpan wide. Twenty-five of them are tied together and laid at the depth of one fathom on ſunk poſts, as the ſevrugas go to ſhallow places. The largeſt of theſe fiſh are never above $4\frac{1}{2}$ arſhines (each arſhine 28 Engliſh inches); but their roes, as well as their ſounds, are much more eſteemed than thoſe of the beluga, and conſequently bear a greater price. The fleſh is partly ſalted down, and partly dried in the ſun. In May, when the ſpring-capture on the ſea-coaſt is over, the fiſhermen repair with their goods to Aſtrachan, where they are laid up in the ſtore-cellars, and thence diſpoſed of wholeſale to the merchants of that city. The autumn-capture begins in the middle of September, and continues through the whole of October. The winter-capture begins as ſoon as the ice is ſet in on the ſea, and laſts the whole winter. For taking the beluga in this ſeaſon, the machine with the angling-hooks already deſcribed is ſet under the ice; through which apertures are cut at the diſtance of eight paces aſunder, and through theſe the rope is introduced, by means of long poles. When two neſts are tied together, the machine is faſtened to a croſs-pole, which reſts on the brink of the aperture. The fiſh, when taken, are conveyed over the ice on ſledges to the vataga, and thence carried to Aſtrachan. Beſides the great vatagas, the proprietors of them have fiſhing-huts in different places on the ſea-coaſt, where there is no capture of ſturgeons, at which, moſtly in ſummer, ſhad and barbels are taken with drag-nets. The ſhads here uſually weigh eight pood (of 40 pounds each), and the barbel a pood and a half: the former are extremely fat in ſummer. The roes of this fiſh are thrown away, but of its ſounds an ordinary ſort of fiſh glue is made. For an account of other fiſheries in the rivers that run into the Caſpian Sea, ſee VOLGA and URAL. See alſo ASTRAKHAN. The ſeal-capture, which is carried on by the more opulent part of the Aſtrachan merchants on the Caſpian, is likewiſe very profitable. The ſeals are killed in ſpring and autumn on the iſlands, where they are immediately gutted and powdered with ſalt, and then brought to Aſtrachan, where they are flayed, and the tallow of them is melted. The Aſtrakanes by ſalting their ſeals immediately on the ſpot gain this advantage, that the tallow is much cleaner and better than that of the ſeals taken at Archangel. The fiſhermen affirm, that the Caſpian is incomparably richer in ſeals than any other ſea on the Ruſſian coaſts. Robertſon's India. Coxe's Travels in Ruſſia, vol. iii. Tooke's View of the Ruſſian Empire, vol. i. and iii.

**CASPIAN** *Gates*, *Caſpiæ Pylæ*, or *Caſpiæ Portæ*, in *Ancient Geography*, denote paſſes that lie between the mountains of Caucaſus and the Caſpian Sea. The name of Caſpian or Albanian gates is properly applied to Derbend, which occupies a ſhort declivity between the mountains and the ſea: the city, if we give credit to local tradition, had been founded by the Greeks; and this dangerous entrance was fortified by the kings of Perſia with a mole, double walls, and doors of iron. The *Iberian* gates, ſometimes confounded by geographers with the *Caſpian*, are formed by a narrow paſſage of ſix miles in mount Caucaſus, which opens from the northern ſide of Iberia or Georgia, into the plain that reaches to the Tanais and the Volga. A fortreſs, deſigned by Alexander, perhaps, or one of his ſucceſſors, commanded that important paſs. Procopius, with ſome confuſion, always denominates them Caſpian. This paſs is now ſtyled "Tatar-topa," the Tartar-gates.

**CASPII**, a people who inhabited the environs of the Caſpian Sea, called "Caſpiana regio," to the weſt and the eaſt of the river Cambyſes, between the Sopyrii and the Caſpian Sea. They occupied alſo the country towards the north of this ſea; and to the eaſt of the Tigris, between Parthia and Media.

CASPIRA, now *Caſhmere*, a town of India on this ſide of the Ganges, near mount Emodus, and towards the north of the ſource of the Hydaſpes. See Cashmere.

CASPIRÆI, a people of India on this ſide the Ganges, to whom Ptolemy has aſſigned 16 cities, of which Cragauſa was the capital.

CASPIRIA, a name given by Ptolemy to the Fortunate Iſlands, ſituate in the Atlantic ocean.

CASPIRUS, a town of Aſia on the frontiers of India, in the country of the Parthians, according to Herodotus, (cited by Steph. Byz.), who calls it Caſpatyrus.

CASPIUS mons, the Caſpian mountain, a name given by Ptolemy to a mountain which bounded the Greater Armenia. The ancients gave this name to two mountains; one, juſt mentioned, bounding Armenia; the other in Parthia.

CASQUE, in *Conchology*, a term among the French, ſynonymous with the Latin *Caſſidea*, a genus of the univalve ſhells eſtabliſhed in the new ſyſtem of Bruguière for the reception of a particular family of the Linnæan Buccina. See Buccinum in article Conchology.

Casque, in *Military Language*, &c. See Cask.

CASQUIPIBIAC, in *Geography*, a river of America, on the northern ſide of Chaleur bay, about a league from Black Cape, N.W. by N. in the bottom of Caſquipibiac cove, at the diſtance of about one league from which is the great river Caſquipibiac, lying weſt from the former, and affording a ſmall cod and ſalmon fiſhery.

CASR. See Kasr.

Casr *band*, a town of Perſia, in the province of Mecran; 185 miles W. of Mecran.

CASSACONI, a canton of Golo, the department of the iſland of Corſica, according to the French arrangement, including 1,112 inhabitants.

CASSADA, or Cassava, in *Botany*. See Iatropha Manihot.

CASSADGATH, in *Geography*, a lake of North America; N. lat. 62° 32′. W. long. 106° 15′.

CASSAGNAS, a town of France in the department of the Lozere, and diſtrict of Florac; eight miles S.E. of Florac.

CASSAGNE, La, a town of France in the department of the Dordogne, ſeven miles S.E. of Montignac.

CASSAGNES,-Begonez, a town of France, in the department of Aveyron, and chief place of a canton in the diſtrict of Rodès or Rhodez; 10 miles S. of Rhodez. The place contains 1432, and the canton 7208 inhabitants: the territory comprehends 217½ kiliometers and 22 communes.

CASSALAGAS, a town of Spain, in Old Caſtile; four leagues from Talavera.

CASSAMUNAIR, or Cassumuniar, in the *Materia Medica*, an aromatic vegetable drug, brought from the Eaſt Indies, highly valued as a nervine and ſtomachic, and reputed a ſpecific in epileptic and convulſive diſeaſes. It is ſuppoſed by ſome to be a ſpecies of galangal, by others of zedoary: its true name is not known, that of caſſamunair being apparently feigned to hide it: of late it has been imported by the name of *bengalle*.

CASSANA, Nicolo, called *Nicoletto*, in *Biography*, a painter of hiſtory and portrait, diſtinguiſhed by the beauty of his colouring, and the gracefulneſs of his figures, was born at Venice in 1659, and received inſtructions from his father Giovanni Franciſco Caſſana, a Genoeſe, who had been taught the art of painting by Bernardino Strozzi. At the court of the grand duke of Tuſcany, whither he was invited, he diſtinguiſhed himſelf by the portraits of that prince and his conſort; and during his reſidence at Florence, he painted ſeveral hiſtorical ſubjects, of which the moſt conſiderable ſeems to have been the conſpiracy of Catiline, conſiſting of nine figures as large as life, drawn to the knees; the two principal figures being repreſented as with one hand joined in the preſence of their companions, and holding in the other a cup of blood. Nicoletto was alſo invited to England with flattering promiſes of encouragement: and on his arrival was introduced to queen Anne, whoſe portrait he painted, and who diſtinguiſhed him by many tokens of favour: but his good fortune was of no long duration, as he died in London in 1713, univerſally regretted. Pilkington.

Cassana, Giovanni Agostino, called *L'Abate Caſſana*, the younger brother of the preceding, was born in 1664, and after receiving the rudiments of his education from his father, finiſhed his ſtudies at Venice, where his brother Nicolo reſided for ſome time. Although he was a good portrait or hiſtorical painter, he declined interfering with his brother in theſe departments of his art, and reſtricted himſelf to the repreſentation of animals and various fruits, in which he excelled. His pictures of this claſs are frequent in the collections of Italy, and ſometimes aſcribed to Caſtiglione. He cloſed his life at Genoa, after having indulged a liberality and profuſion, which his circumſtances did not warrant, in neglect, indigence and wretchedneſs. He had a ſiſter, Maria Vittoria Caſſana, who painted images of devotion for private amateurs, and died at Venice in the beginning of the 17th century. Pilkington.

CASSANDER, a king of Macedon, was ſon of Antipater, and one of Alexander's chief captains. Upon the death of Alexander, and the ſubſequent diviſion of his empire, the province of Caria was aſſigned to Caſſander, and he was alſo appointed by his father general of the horſe. When Antipater died, in the year B. C. 319, he bequeathed his high offices of protector and governor of Macedon to Polyſperchon; by which preference the reſentment of the ambitious Caſſander was rouſed, ſo that he ſoon began to form a party for the ſubverſion of the new protector's power. Accordingly he withdrew to the court of Antigonus, and having obtained ſome ſuccours from him, failed for Athens, and ſecured it. He afterwards marched to Macedon, for the purpoſe of oppoſing the tyranny of Olympias, widow of Philip, and mother of Alexander; and having beſieged her in Pydna, he took poſſeſſion of the place, and ordered her to be put to death. After her deceaſe, he ſent Roxana and her ſon Alexander to Amphipolis, where they were made priſoners; and thus ſet aſide the line of Alexander, in Macedon, his own country. Caſſander having provided for his own ſafety, aſſumed the government: built a new city in Pallene, which he called Caſſandria, repaired many others, and by various meaſures manifeſted his inclination to reſtore peace and plenty to his native country. Having eſtabliſhed tranquillity in Macedon, he returned into Greece in order to drive from thence Polyſperchon, his ſon Alexander, who was protected by Antigonus, and his other enemies. In the mean while he rebuilt Bœotian Thebes, which had lain in ruins about 20 years, and cauſed it to be re-inhabited. After various military conteſts, the captains of Alexander became weary of the wars in which they had engaged with each other, and therefore unanimouſly deſiring peace, it was eaſily concluded on the following conditions, viz. that each of them ſhould retain poſſeſſion of the provinces which then belonged to them; that the Greek cities ſhould be free, and that they ſhould be friends, and allies of each other. Caſſander, in order the more effectually to ſecure himſelf in the poſſeſſion of Macedon, put to death Roxana and her ſon Alexander, whom he had kept in a ſtate of confinement;

finement; and he alſo engaged Polyſperchon by liberal offers to murder Hercules, the ſon of Alexander by Barſine, whom he had ſet up as king of Macedon. In this ſtate of imagined ſecurity, the Grecians formed a league againſt him, and with the ſupport of Demetrius, the ſon of Antigonus, reduced him to great extremities. He ſucceeded, however, in forming a powerful alliance againſt Antigonus, who loſt his life at the battle of Ipſus, B. C. 301. On the death of Antigonus, the princes confederated againſt him, divided his dominions among them, and Caſſander recovered all that he had lately loſt. Jealous of the power of Pyrrhus, king of Epirus, whom he had hated and perſecuted from his infancy, he ſtrengthened the frontiers of his own territories, repaired cities that were falling into decay, and built new ones in the moſt eligible ſituations, and particularly the famous city of Theſſalonica, which was ſo named in honour of his wife. He endeavoured, alſo, by all the methods which policy ſuggeſted, to fix the attachment of his ſubjects to himſelf and his family. Whilſt he was thus employed, a dropſical complaint terminated his life, B. C. 298, after he had held the government of Macedon 19 years, during three of which the title of king had been appropriated to him by others, though he never himſelf aſſumed it. The political and military talents of Caſſander have been univerſally allowed; but his ambition had no bounds, and rendered his character peculiarly odious. Alexander, whom he had offended in his youth, and who had treated him with ſeverity, was the object of his invincible hatred and terror; and his enmity againſt him was indulged to ſuch a degree, that he concerted meaſures for the utter extirpation of his family. Anc. Un. Hiſt. vol. viii.

Cassander, George, a learned divine, was born in 1515, in the iſle of Cadſand, near Bruges, whence was formed his Latin name. He acquired a profound knowledge in the languages, polite literature, civil law, and divinity; and taught the belles lettres at Ghent, Bruges, and other places with great reputation. He afterwards directed almoſt his ſole attention to theological ſtudies, and retiring to Cologne, proſecuted his favourite idea of forming an union and reconciliation between thoſe religious parties which at this period ſo much divided Europe. On this ſubject he publiſhed without his name, in 1562, a ſmall work, entitled "De Officio Viri pii, &c." or, "On the Duty of a pious Man, and a ſincere Lover of Peace, in religious Differences;" which, favouring the Roman Catholic church, on the general ground of authority, was attacked by Calvin, with his uſual acrimony of ſtyle, on a ſuppoſition that it was written by Baudouin, a celebrated lawyer. When the true author was diſcovered, it was attacked a ſecond time, by Calvin, and a temperate reply was written by Caſſander. The ſentiments diſplayed in this anſwer induced the German princes to fix upon Caſſander as a mediator in the religious diſputes. Under this character he compoſed his famous piece entitled "Conſultatio Caſſandri," in which he diſcuſſes the ſeveral articles of the Augſburg confeſſion, ſtating their difference from the doctrines of the Catholic church, and the conceſſions that might be ſafely made with reſpect to them. This work, which was written with great liberality, was much applauded by thoſe who were deſirous of a coalition. Caſſander cloſed his life in 1566, in his 53d year. M. De Thou repreſents him as modeſt, void of arrogance, and acrimony; and he was as ardent in his wiſhes for a religious union, and made as many conceſſions for the accompliſhment of this object, as could be expected from a perſon who continued in the Catholic communion; but *authority* was an inſuperable barrier. Caſſander wrote ſeveral other works, which were firſt printed ſeparately, and afterwards collected into one volume, fol. Paris, 1616. Of theſe are "Liturgica," or "On the Rite and Order of the Celebration of the Lord's Supper;" "A Collection of Hymns," and of "Collects;" the "Decalogues of Vigilius, biſhop of Trent, and his Books againſt Eutyches;" the "Treatiſe of Honorius on Predeſtination and Grace;" "On Infant Baptiſm, and on the Origin of the Anabaptiſt Sect;" "Letters to ſeveral Men of Eminence," chiefly on religious topics; "Rules and Precepts of Rhetoric and Logic;" "A Reduction of Greek and Roman Money to Flemiſh;" and ſome other ſmall pieces. Du Pin. Hiſt. Eccleſ. Thuani Hiſt. Moreri.

CASSANDRA, in *Entomology*, one of the Fabrician ſpecies of Phalæna, (*Bombyx*), deſcribed from the Hunterian muſeum. The wings are ferruginous, with darker ſtreaks; anterior part of the thorax cheſnut.

Obſ. Cramer deſcribes a variety of the Fabrician *bombyx erythrinæ* as a diſtinct ſpecies under the name of *caſſandra.*

Cassandra, *Gulf of*, in *Geography*, a bay on the coaſt of European Turkey, in the north-weſt part of the Archipelago, eaſt of the gulf of Saloniki. It is ſo called on account of a ſmall iſland of the ſame name that lies at its extremity; and it was formerly called "Toronaicus Sinus." N. lat. 40°. E. long. 23° 44′.

Cassandra *Nova*, a town of European Turkey, in the province of Macedonia, ſituate on the north coaſt of the entrance into the gulf of Saloniki; 15 miles E. of Saloniki.

Cassandra, in *Fabulous Hiſtory*, daughter of Priam, king of Troy, and Hecuba, who is ſaid to have received the gift of prophecy from Apollo, on condition of gratifying his paſſion. Having obtained the gift, ſhe violated her engagement; and Apollo, being thus deceived, inſtead of revoking the grant, cauſed her to be conſidered as mad, and her predictions to be diſregarded. Many of the predictions, which ſhe delivered, during the impending calamities of Troy, were afterwards verified in the event. During the ſack of that city, ſhe fled for ſafety into the temple of Minerva, where ſhe was barbarouſly violated by Ajax, the ſon of Oileus. See Ajax *Oiliades.* In the diſtribution of the plunder of Troy, Caſſandra fell to the lot of Agamemnon, who took her home, where ſhe excited the jealouſy of Clytemneſtra; ſo that ſhe fell a victim, on occaſion of the aſſaſſination of that prince. Caſſandra was ſingularly beautiful, and had many ſuitors of diſtinguiſhed rank in the flouriſhing time of Troy. She had a temple at Leuctra, in which a ſtatue was erected to her honour, under the name of Alexandra, by which appellation ſhe was as well known as by that of Caſſandra. This appears from Lycophron's poem, ſtill extant, entitled Alexandra, becauſe it is a prophecy made, as the poet ſuppoſes, by Caſſandra. This poet alſo ſpeaks of a temple of Caſſandra built by the Daunians, and by the inhabitants of the city of Dardanus; where her ſtatue was recurred to as an aſylum by young women who rejected their ſuitors on account of their uncomelineſs or mean extraction. Plutarch ſays, that there was in Thalamæ, a city of Peloponneſus, an oracle of Paſiphæ; and that, as ſome writers reported, Caſſandra died in that place, and was called Paſiphæ, becauſe ſhe delivered oracles to all who conſulted her. Gen. Dict.

CASSANDRIA, in *Ancient Geography*, a maritime town of Macedonia, more anciently called *Potidæa*, and rebuilt by Caſſander, whence it derived its name. See Cassandra.

Cassandria, in *Geography*, a town of Dutch Flanders, in the iſland of Cadſand; one league N. of Sluys.

CASSANITÆ, in *Ancient Geography*, a people of Arabia Felix, on the banks of the Red Sea.

CASSANO, in *Geography*, a town of Naples, in the province of Principatro Ultra; 12 miles W. of Conza.—Alſo, a town of Naples, in the country of Bari; 15 miles S. of Bari.—Alſo, a town of Naples, in the province of Calabria Citra, the ſee of a biſhop, ſuffragan of Coſenza; 21 miles N.W. of Roſſano. N. lat. 39° 55′. E. long. 16° 30′.—Alſo, a town of the duchy of Milan, ſeated on the Adda; 16 miles N.E. of Milan. N. lat. 45° 20′. E. long. 10°.

CASSARANO, a town of Naples, in the province of Otranto; 8 miles W.N.W. of Aleſſano.

CASSAREEN, the ancient *Colonia Scillitana*, memorable for the martyrdom of its citizens, a town of Africa, in the inland country of the ancient Bizacium, and preſent kingdom of Tunis, ſeated on an eminence, 6 leagues W.S.W. of Spaitla. The river Derb runs winding below it; and upon a precipice that hangs over this river is a triumphal arch, with an attic ſtructure above it, with ſome rude Corinthian-like ornaments upon the entablature, though the pilaſters are Gothic. In the plains below Caſſareen are ſeveral Mauſolea, from which the town is ſaid to derive its name; theſe appearing at a diſtance like ſo many Caſſareen, i. e. towers or fortreſſes.

CASSATION, derived from the Latin *quaſſare*, to quaſh, or ſhake down, in the *Civil Law*, the act of abrogating, or annulling any act of procedure.

The occaſions of caſſation are, 1ſt, when a decree is directly contrary to another decree; and both againſt the ſame party. 2dly, When decrees are directly contrary to the expreſs deciſion of ſtatutes or cuſtoms. 3ly, When the formalities preſcribed by the laws have not been obſerved.

CASSE, in *Military Language*, a breaking or caſhiering, is a diſgraceful or an ignominious deprivation of, or diſmiſſion from, any military office, rank, ſituation, or employment.

This puniſhment has been and may be extended to an entire corps, to a company, to an officer, to a non-commiſſioned officer, or to a ſoldier of a choſen or ſelect company.

To break or caſhier a body of troops, as a regiment or a company, for example, is to degrade and depoſe or diſmiſs it after having adjudged it guilty of an offence that renders it unworthy of ſerving its country.

To break or caſhier an officer, is to deprive him of, or diſmiſs him from, his employment, becauſe his conduct and behaviour have been unworthy of, or unbecoming the rank he holds, or becauſe he has been guilty of ſome great offence againſt military diſcipline.

To break or caſhier a non-commiſſioned officer is, to withdraw from him the authority he was entruſted with, to deprive him of the employment he filled, and to reduce him to the condition of a common ſoldier.

And to break or caſhier a ſoldier or member of a choſen, particular, or ſelect company, as a grenadier, for inſtance, is to ſend him back to the company from which he was taken or ſelected, after ſhewing him to be undeſerving or unworthy of the diſtinguiſhed ſituation he was placed in.

The practice of breaking or caſhiering whole regiments or companies ignominiouſly, for miſconduct or miſbehaviour, is now, however, and perhaps, with reaſon, altogether laid aſide. For, let a regiment or company behave ever ſo ill, it rarely, or rather never happens, that every individual in it is in fault. Some other military puniſhment ſhould, therefore, be adopted, that has a tendency to make thoſe in a company or other body of troops, who are naturally diſpoſed to behave well, feel intereſted in the good behaviour of the reſt, and act as a check on them. The Romans had a practice which was admirably calculated to produce this effect. When a maniple, cohort, or other body of their troops behaved ill in the face of an enemy, or were guilty of any thing diſgraceful to the military character; they, in the moſt public manner, drew out from the body, by lot, every tenth man for puniſhment, which was inflicted without mercy. The others that remained, or on whom the lot did not fall, were fed on barley inſtead of wheat, and were lodged without the entrenchment expoſed to the inſults of the enemy. Such an inſtitution was well contrived both for impreſſing terror and for preventing military offences and miſconduct.

Casse-*noiſette*, Buff. in *Ornithology*, the *blue-capped manakin* of Engliſh writers, and *pipra manacus*, which ſee.

Casse *noix*, the name given by Buffon to the *nut-cracker*, *corvus caryocatactes*, which ſee.

CASSEBOHM, Frederic, in *Biography*, profeſſor of anatomy at Hall in Saxony, was one of the pupils to Winſlow, and approved himſelf a diligent and expert anatomiſt. He laboured, in a particular manner, to acquire a knowledge of the ſtructure of the human ear, at different periods of life, from the embryo of three months, to its perfection in the adult. In 1734, he publiſhed, as the reſult of his experiments to that time, "Tractatus quatuor Anatomici de Aure Humana, Tribus Figurarum Tabulis illuſtrati," 4to. They contain more complete and exact deſcriptions of all the parts of the ear, the bony ſtructure, muſcles, nerves, and veſſels, than were before extant. The following year he added two other diſſertations on the ſame ſubject, completing his deſign. He had before, viz. in 1730, publiſhed "De Differentia Fœtus et Adulti," Hall, 4to. in which, among other things, he notices the deſcent of the teſticles from the cavity of the abdomen into the ſcrotum. "Methodus ſecandi Muſculos, et Methodus ſecandi Viſcera," both publiſhed in 1740, in 8vo. contain uſeful rules for the aſſiſtance of the young anatomiſt. They were only parts, however, of a larger work intended to contain the anatomy of the whole body, which, by an early death, he was prevented completing. Haller was in poſſeſſion of his manuſcript, which he deſcribes as containing much valuable matter. See his Bib. Anatom.

CASSEDE, in *Geography*, a town of Spain, in Navarre; 2 leagues from Sangueſa.

CASSEELAS, a town of America, in the ſtate of Georgia; 165 miles W.S.W. of Auguſtine.

CASSEL, a city of Germany, the capital of the landgravate of Heſſe-Caſſel, in the circle of the Upper Rhine. It is divided by the river Fulda into the Old and New Towns, which are united by a bridge: the former is the largeſt, but ill built; the ſtreets are narrow and winding, and the houſes irregular, old, and moſtly conſtructed with timber. The New town is divided into Upper and Lower, the latter being ſmall and as ill built as the Old town. The Upper New town, called alſo the French town, from its having been firſt inhabited by French Proteſtants, who ſought a refuge here after the revocation of the edict of Nantz, is reckoned beautiful. The ſtreets are wide and ſtraight; the houſes uniformly built in a good ſtyle, with many magnificent palaces and public edifices. The manege is light and elegant; the pavilion exhibits a good ſtyle of architecture, and is pleaſantly ſituated in gardens richly decorated and perfumed with orange trees, and enlivened by the cheerful notes of Canary birds, which fly wild and unconfined about them; the muſeum, built by the landgrave, Frederic II., to whom the town owes many of its public ornaments, is a noble building, and contains a valuable collection of antique gems and ornaments, ſtuffed beaſts, ſtatues, buſts, and cork models of Rome, and a curious burning-glaſs, &c.; the library is a magnificent room, about 500 feet long and

40 broad; and contains, among other valuable books and MSS., a MS. of Thucydides, an Hebrew MS. collated for Dr. Kennicott, and a Latin Bible, printed at Mentz, in 1562, by John Fuſt and Peter Schaeffer. It has alſo a theatre, an anatomical theatre, and ſeveral churches. Romiſh and Calviniſtical churches are allowed, but they are not ſuffered to have any bells. At Caſſel there are ſeveral manufactures of cloth and woollen ſtuffs, fine hats, gold and ſilver lace, ſtockings of worſted and ſilk, tobacco, earthenware in imitation of China, &c. The town, which has been often injured by war, contains about 22,000 inhabitants. It is 84 miles N.E. of Coblentz, and 34 N.N.E. of Mentz. N. lat. 51° 19′ 4″. E. long. 9° 29′.

Cassel, a town or village of Germany, in the circle of the Lower Rhine, ſituate on the Maine, oppoſite to Mentz, with which it communicates by a bridge of boats. It was taken by the French in 1792, and fortified by them; but in the next year it was ſet on fire in the ſiege of Metz, when it was retaken by the Pruſſians.

Cassel, a town of France, in the department of the North, and chief place of a canton, in the diſtrict of Hazebrouch, ſeated on a hill which commands an extenſive view of the country, including 32 cities and towns, and the caſtle of Dover; 7½ poſts E.S.E. of Calais, and 6 poſts W.N.W. of Lille. N. lat. 50° 48′. E. long. 2° 27′. The place contains 3,601, and the canton 13,200 inhabitants: the territory includes 120 kiliometres and 13 communes.

CASSENIEU, a town of France, in the department of the Charente, and diſtrict of La Rochefoucault, 6 miles N.E. of La Rochefoucault.

CASSENTINO, Jacopo Di, in *Biography*, a painter of hiſtory and portrait, was born at Caſſentino in 1276, and learned the art of painting from Taddeo Gaddi. He was regarded, in his time, as an artiſt of conſiderable merit, both in freſco and diſtemper; and executed many works in his native city, in Arezzo, and in Florence; and in 1350, became the founder of the Florentine academy. He died in 1356. His moſt memorable work was that which he painted in the chapel of his academy, repreſenting St. Luke drawing the portrait of the Virgin, on one ſide of which were all the academicians, 10 in number, and on the oppoſite ſide all their wives. Pilkington.

CASSER, in *Geography*, a town of Aſia, in the Arabian Irak, on the Tigris; 120 miles S.E. of Bagdad.

CASSERES, a river of Africa, which runs into the ſea, to the north of the river Sierra Leona.

CASSERIUS, Julius, in *Biography*, a diſtinguiſhed anatomiſt of humble parentage, but of great talents, was born at Placentia in 1545. His genius leading him to the ſtudy of anatomy, he went to Padua, and became a ſervant to Fabricius, who, diſcovering his propenſity, made him his pupil, and, in ſucceſſion, his aſſiſtant, and, at length, coadjutor in the profeſſorſhip of anatomy. To this honour he was preferred in the year 1609, and he continued to fill the office with credit until the year 1616, when he died. As his diligence and induſtry equalled his genius, he became, in a few years, more knowing and ſkilful in his profeſſion than his preceptor. Fabricius, in the opinion of Douglaſs, excelled in philoſophy, Caſſerius in anatomy. This excited, however, no jealouſy. Fabricius, who was far advanced in years, was well pleaſed with the proſpect of leaving a ſucceſſor, ſo well qualified to advance the knowledge of the art; but in this he was diſappointed, as he ſurvived his pupil by more than three years. He was ſucceeded by Spigelius, who had been their common pupil. Of Caſſerius's anxious deſire to leave behind him a name, we have numerous proofs. Almoſt the whole of the revenue he obtained by teaching anatomy was expended in procuring ſubjects for diſſection, and in paying draughtſmen and engravers to delineate figures of ſuch parts of the body as he either diſcovered, or thought he had juſter conceptions of than his predeceſſors. In the prefaces to his anatomical works he is not backward in affirming that he has furniſhed future anatomiſts with delineations of the parts of human and animal bodies, exceeding in elegance, perſpicuity, and correctneſs, all that had preceded them. It will be obſerved he made uſe of animals, not as ſuccedanea, but only to enable him to diſcover minute parts which were not eaſily diſtinguiſhable in the human body. In giving this account, principally from Douglaſs's Specimen and the Dict. Hiſtor. of Med. Eloy. we cannot help obſerving in how many points, in genius, in induſtry, and zeal for the advancement of the art, a late celebrated anatomiſt, Mr. John Hunter, reſembled the character we are here depicting. The title of his firſt work, publiſhed in 1600, is, "De Vocis Auditusque Organis Hiſtoria Anatomica, &c. Tractatibus duobus explicata, Ferrara, fol. Figuræ partium tam in homine, quam in multis aliis animantibus, tabulis 33 comprehenſæ ſunt." He here lays claim to the diſcovery of a muſcle, moving the malleus, one of the oſſiculæ auditus. He alſo improved, Haller ſays, the anatomy of the larynx. "Pentæſtheſejon, id eſt, de quinque Senſibus Liber, Organorum Fabricam, Actionem, et Uſum continens, Venet. 1609, fol. Iconibus fideliter ære inciſis illuſtratum." This is an extenſion of the former work to the reſt of the ſenſes, executed with equal ſkill. They have both been ſeveral times reprinted. It was not until ſome years after the death of Spigelius, which happened in 1622, that the remainder of Caſſerius's works, conſiſting of 78 anatomical plates, with the explanations, was publiſhed. Bucretius, to whom Spigelius had left the care of his productions, incorporated the works of Caſſerius with them, and publiſhed them together in royal folio, in 1627, at Venice. Two of the plates by Caſſerius, viz. one repreſenting the placenta, and another the hymen, are printed with Spigelius's work, "De Formato Fœtu," fol. 1627. Douglaſs, Bib. Anat. Spec. Haller Bib. Anat. Eloy. Dict. Hiſt.

CASSETTES, or Coffins, in the *Manufacture of China Wares*, are utenſils made of Stourbridge or other good potter's clay with a third of ſand, in which the China ware is baked. They are generally made of a round form, with a flat bottom. They are either turned or formed in a mould. See Porcelain.

CASSI-*aſcher*, a name given to the grand provoſt of the Turkiſh armies.

Cassia, in *Botany*, (κασσια, Dioſc.; κασια, Theophraſt.) in its original acceptation, is the name of an oriental ſhrub, the bark of which has been held in high eſtimation, from the earlieſt antiquity, on account of its aromatic qualities, which reſemble thoſe of cinnamon. The grammarians who for the moſt part think it better to invent a bad etymology than go entirely without one, tell us, that it is called παρα το κασαι, ab ornando, quaſi κοσμεισθαι δια της ευοσμιας τας αισθησεις, quod ſuâ fragrantiâ ſenſus ornat. But the word is indiſputably of Aſiatic origin, and was brought into Greece, along with the commercial article which it denoted, by the Phœnician merchants. It is no other than the קְצִיעָה, ketſieh, of the Hebrews and other orientals. In the books of the Old Teſtament it occurs, indeed, only once, and that in the plural number. "Thou loveſt righteouſneſs and hateſt wickedneſs: therefore God, thy God, hath anointed thee with the oil of gladneſs above thy fellows. All thy garments ſmell of myrrh and aloes, and caſſia." Pſ. xlv. 7, 8. This pſalm, we apprehend, may be referred without heſitation to the reign of Solomon. The plural termination was probably adopted by the Hebrews, on account of the ſmall detached pieces into which the bark was uſually divided when it came into the hands of the merchants; but the ſeventy in conformity with the general uſage of Greek writers, give it in the ſingular number and with a ſingle σ, which appears to be the original orthography. But though the Phœnicians communicated the name to the Greeks, they did not themſelves adopt that by which this precious commodity was known in its native climate. In the Hebrew language, of which the Syro-Phœnician is only a different dialect, the verb קצע ſignifies to ſtrip any thing of its covering; and thence was naturally applied in a ſubſtantive form to denote the bark of a tree ſeparated from the trunk: and the high value which was ſet on the aromatic bark brought from the remoteſt regions of the then known earth, might as naturally cauſe it to be called bark by way of eminence; in the ſame manner as another kind of bark is thus diſtinguiſhed in modern times. The word caſſia occurs in two other paſſages of our common tranſlation of the Old Teſtament: Exod. xxx. 24. Ezek. xxvii. 19.; but in theſe the original קִדָּה, which the ſeptuagint in Exodus render ιρις, in Ezekiel appear not to have had in their copies. It was probably ſomewhat different from Caſſia; but from its connection in the book of Exodus with myrrh, cinnamon, and ſweet calamus, appears to have come from the ſame countries, and to have poſſeſſed ſimilar properties.

This oriental aromatic is the caſſia of modern cookery, but not of modern botany. We muſt, therefore, refer for its character and hiſtory to the article *laurus*, under which genus it is now placed.

The naturaliſt has often reaſon to lament that travellers and merchants have given the name of one thing long known to another recently diſcovered, on account of a real or fancied reſemblance in a ſingle particular, although in every other reſpect it is entirely different. Such has been the fate of caſſia. The Romans uſed the word with conſiderable latitude. When Virgil, extolling the ſimple fare of the happy huſbandman, ſays,

> "Nec caſia liquidi corrumpitur uſus olivi,"

he cannot be ſuppoſed to ſpeak of the caſia which he mentions in his ſecond eclogue, as interwoven with the flowers of the violet, poppy, narciſſus, and ſweet ſmelling aniſe in the garland made for Alexis by the naiad. In the former paſſage he undoubtedly alludes to the aromatic bark which the luxurious citizens of Rome infuſed in their table and culinary oil to give it a grateful ſmell and flavour. In the latter he muſt have intended ſome odoriferous herb, or ſhrub, which is a native of Italy; but by what name it is now known cannot eaſily be determined.

In the middle ages, the Arabian and Greek phyſicians, as appears from the writings of Avicenna and Myrepſus, acknowledged two kinds of caſſia; one, caſſia aromatica, a native of India, the caſſia of the ancients; the other, caſſia ſolutiva, a native of Egypt, totally different in its general appearance, botanical characters, and medical qualities; and which appears to have been honoured with the ſame name as that which from time immemorial had diſtinguiſhed the precious oriental ſpice, merely on account of its pleaſant ſmell; for we are informed by Alpinus, that when he was in Egypt in the latter part of the ſixteenth century, the natives took great delight in walking early in the morning in the ſpring ſeaſon near plantations of this kind of caſſia, and regaling themſelves with the fragrance of its flowers. To this ſpecies, and its numerous congeners, the term caſſia, as a generic appellation, is confined by modern botaniſts.

Linn. gen. 514. Schreb. 700. Juſſ. p. 348. Vent. vol. iii. p. 371. Gært. 755, 756. Tourn. Cl. 21. § 5. gen. 1. 3. Claſs and order, *decandria monogynia*. Nat. ord. *Lomentaceæ*, Linn. *Leguminoſæ*, Juſſ.

Gen. Ch. *Cal.* Perianth five-leaved, (five-cleft, Gært. Juſſ.) lax, concave, coloured, deciduous. *Cor.* Petals five, roundiſh, concave; lower ones more diſtant, more ſpreading, larger. *Stam.* Filaments ten, declined; the three inferior ones longer; three inferior anthers very large, arcuate, beaked, opening at the tip; three lateral ones without a beak; three upper ones very ſmall, barren. *Piſt.* Germ ſomewhat cylindrical, long, pedicelled; ſtyle very ſhort; ſtigma obtuſe, aſcending. *Peric.* Legume oblong, with tranſverſe partitions. *Seeds* ſeveral, roundiſh, affixed to the upper ſuture.

Eſſ. Ch. *Calyx* five-leafed. *Petals* five; three upper anthers barren; three lower ones beaked. *Fruit* a legume.

Obſ. Tournefort divided the genus into two; caſſia with oblong legumes, entire partitions, and generally pulpy cells; and ſenna, with gibbous, inflexed partitions, and very thin partitions. Gærtner has adopted his two genera with the following eſſential characters.

Senna. *Calyx* five-cleft, deciduous. *Cor.* Petals five, lower ones larger. *Stamens* ten, ſeparate; three upper anthers barren, the reſt fertile: three lower ones arcuate. *Legume* membranous, many-celled. *Seeds* albuminous. *Embrio* ſtraight.

Caſſia. *Flower* as in ſenna. *Legume* long, cylindrical, woody, not opening by valves, many-celled; cells filled with pulp. *Seeds* albuminous; albumen with a chink on each ſide. *Embrio* ſtraight.

Sp. 1. C. *diphylla*, Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Willd. 1. (Niella-warei Indorum, Burm. Fl. Ind. 94.) "Leaves conjugate; ſtipules cordate-lanceolate." A ſhrub. *Stem* cylindrical. *Leaves* on a ſhort petiole; leaflets two, ſemi-orbicular, obtuſe, ſtriated. *Stipules* covering the branches. A native of the Eaſt Indies. La Marck obſerves that it muſt have been marked as an annual in the Species Plantarum by miſtake; for no ſhrub can be an annual. 2. C. *Abſus*, Linn. Sp. Pl. 2. Mart. 3. Lam. 2. Willd. 2. (Senna quadrifolia, Burm. Zeyl. 212. tab. 97. Senna exigua, &c. Pluk. alm. 341. tab. 60. fig. 1. Loto affinis Ægyptiaca, Bauh. pin. 332. Abſus, Alp. Ægypt. 97.) "Leaflets in two pairs, inverſely egg-ſhaped; with two awl-ſhaped glands between the loweſt." *Root* annual. *Stem* herbaceous, ſcarcely a foot high, weak, villous, branched. *Leaves* alternate. *Flowers* reddiſh, marked with purple veins, axillary, two or three together; peduncles ſhorter than the leaves. *Legumes* about an inch long, compreſſed, hiſpid. *Seeds* from four to ſix, blackiſh, ſhining. 3. C. *viminea*, Linn. Sp. Pl. 2. Mart. 4. Lam. 3. Willd. 3. Brown, Jam. 223. Sloane Jam. 2. 49. tab. 189. fig. 6, 7. Swartz obſ. 156. "Leaflets in two pairs, ovate-oblong, acuminate; with an oblong gland between the loweſt; and an obſolete, three-toothed ſpine, or callous ſcale under each petiole." A ſhrub. *Stem* forty or fifty feet high, ſtriated, ſtiff; branches divaricated, looſe, ſtiffiſh, round, ſtriated, ſmooth, ſpinous when old. *Leaflets* petioled, entire, nerved, veined, very ſmooth; lower pair bent down, ſpreading; upper pair bent down perpendicularly, approximating; general petioles thickened at the baſe, round, uſually directed one way. *Flowers* numerous, large, in axillary racemes, on long peduncles; calyx-leaves egg-ſhaped, reflexed, ſpreading, ſmall, pale green; four upper petals ſmaller, egg-ſhaped, with claws; the fifth largiſh, concave; germ linear, longer than the corolla, curved back. *Legume* ſhort, compreſſed. Swartz. A native of Jamaica in the woods of the higher mountains, in the anterior of the iſland. 4. C. *bacillaris*, Linn. jun. Supp. p. 231. Mart. 2. Lam. 4. Willd. 4. (C. fruticoſa, Mill. dict. 10. Mart. 39. C. americana tetraphylla, Houſt.

Reliq. tab. 17.) "Leaflets egg-ſhaped, oblique, in two pairs, with an obtuſe gland between the loweſt; racemes axillary, peduncled; legumes cylindrical, long." A ſhrub, twelve feet high, very ſmooth. *Leaves* alternate, petioled; leaflets ſmooth on both ſides; lower ones exactly egg-ſhaped; upper ones more elongated. *Stipules* none. *Flowers* orange, of a middling ſize; racemes ſolitary, few-flowered, erect; pedicels dependent, angular. *Legume* ſo like that of C. fiſtula as not to be diſtinguiſhed from it. A native of Surinam and Vera Cruz. Miller attributes terminal racemes to his C. fruticoſa, but as La Marck refers Houſtoun's figure to bacillaris, and as Miller's deſcription agrees ſufficiently with that of the younger Linnæus, we have ventured to conſider them as one and the ſame ſpecies. 5. C. *arborea*, (C. arboreſcens, Mart. 40. Mill. dict. 15. Houſt. MSS.) "Leaflets in two pairs, oblong-egg-ſhaped, villous underneath; flowers in corymbs; ſtem erect, arboreous." *Trunk* twenty-five or thirty feet high, much branched. *Leaves* on long petioles; leaflets four inches long, near two broad. *Flowers* deep yellow, inclining to orange, lateral and terminal; lateral ones few, ſcattered; terminal in large round branches, proceeding from one centre. *Legumes* near nine inches long, compreſſed, with a border on each ſide. *Seeds* oval, ſmooth, compreſſed. A native of Vera Cruz. 6. C. *tetraphylla*, Mart. 44. (C. procumbens, Mill. dict. 20. Houſt. MSS.) "Leaflets in two pairs, egg-ſhaped; flowers ſolitary, axillary; legumes hirſute; ſtems procumbent." *Root* annual. *Stems* about two feet long, herbaceous. *Leaves* on long petioles, at a conſiderable diſtance from each other. *Flowers* pale yellow. *Legumes* ſhort, flat. *Seeds* flat. A native of Vera Cruz. 7. C. *Tagera*, Linn. Sp. Pl. 5. Mill. 5. Lam. 6. Willd. 5. (Tagera, Rheed. Mal. 2. p. 103. tab. 52? Rai. hiſt. p. 1743. Caſſia 6. Senna ſpuria, &c. Amm. herb. 603. 33?) "Leaflets in three (two) pairs; gland petiolar; ſtipules ciliated, heart ſhaped, acuminate." Linn. "Leaflets in two pairs, inverſely egg-ſhaped; peduncles one-flowered, very ſhort; legumes narrow, linear." Lam. A ſhrub. *Stem* procumbent; branches filiform. *Leaflets* four, ſemi-orbicular, veined, the two outer ones larger; petioles very ſhort. Linn. *Stem* three or four feet high, hard, cylindrical, greeniſh. *Leaves* alternate; leaflets thickiſh, flat, with parallel nerves, the two upper ones largeſt. *Flowers* yellow, axillary. A native of Malabar. La Marck queſtions whether his plant be the tagera of Linnæus, and obſerves that it is diſtinguiſhed from the next ſpecies by the number of its leaflets. We are perſuaded that *trijugis* in Linnæus's ſpecific character is merely an error of the preſs. 8. C. *Tora*, Linn. Sp. Pl. 5. Mart. 6. Lam. 7. Willd. 6. (Senna orientalis, tala Zeylanenſium Herm. Lugd. 557. Rai. hiſt. 1743. Galega indica, Rai. hiſt. 911. Gallinaria rotundifolia, Rumph. Amb. 5. p. 283. tab. 97. fig. 2. Caſſia ſiliquis fœni Græci, Plum. ſpec. 18. tab. 76. fig. 2. Caſſia ſiliqua quadrang., Dill. Elth. 72. tab. 73. fig. 73.) "Leaflets in three pairs, inverſely egg-ſhaped; outer ones larger; an awl-ſhaped gland between the four lower ones." Linn. "Leaflets in three pairs, inverſely egg-ſhaped; peduncles ſhort, generally one-flowered; legumes linear, long, very narrow." Lam. *Root* annual. *Stem* from one to two feet high, herbaceous, upright, cylindrical, ſometimes ſimple, more frequently branched, ſmooth. *Leaves* alternate; leaflets ſmooth, ſomewhat glaucous, with a pointed gland between each of the lower ones; ſtipules linear, briſtle-ſhaped, a little villous. *Flowers* yellowiſh, axillary. *Legumes* from four to ſix inches long, with a ſmall border on each ſide, more or leſs curved, ſmooth. A native of the Eaſt Indies. 9. C. *limenſis*, Lam. 8. Miller Dict. tab. 82? "Leaflets in three or four pairs, inverſely egg-ſhaped, very obtuſe; ſmooth; racemes peduncled, elongated, axillary." Nearly allied to the preceding, but eaſily diſtinguiſhed from it by the infloreſcence. *Root* annual. *Stem* a foot and a half high, ſmooth, ſlightly angular towards the ſummit, ſomewhat branched. *Leaves* becoming larger as they increaſe in diſtance from the root; loweſt ones with only one pair of leaflets, thoſe above with two, thoſe ſtill higher with three, and thoſe near the ſummit ſometimes four; ſtipules awl-ſhaped. *Flowers* yellowiſh; from ſeven to ten together in peduncled axillary racemes. Found by Dombey about Lima. 10. C. *bicapſularis*, Linn. Sp. Pl. 6. Mart. 7. Lam. 9. Willd. 7. (C. hexaphylla; ſiliqua bicapſulari, Plum. Spec. 18. Burm. Amer. tab. 76. fig. 1.) "Leaflets in three pairs, inverſely egg-ſhaped, ſmooth; inner ones rounder, with a globular gland between them." A ſhrub. *Stem* ſix or eight feet high, ſingle, branched near the ſummit; branches cylindrical, greeniſh. *Leaves* alternate. *Flowers* bright yellow, veined; from three to five together in axillary, peduncled racemes, ſeldom longer than the leaves. *Legumes*, according to Plumier, long, cylindrical, divided in their whole length into two cells, forming contiguous tubes. La Marck, from a living plant in flower, but not perfecting its fruit. A native of South America. The bicapſularis of Miller is an annual plant, a foot and half high; with an erect, herbaceous ſtem, three pair of oval leaflets to each leaf; the flowers yellow, ſmall, axillary, ſolitary; pods taper; a native of the Weſt Indies and Madeira. It muſt therefore, as profeſſor Martyn obſerves, be a different ſpecies. 11. C. *emarginata*, Linn. Sp. Pl. 7. Mart. 8. Lam. 10. Willd. 8. (C. minor hexaphylla, ſennæ foliis; Sloane Jam. 2. p. 44. tab. 180. fig. 1, 2, 3, 4. Brown Jam. 223. 3. Swartz. Obſ. 157. C. racemoſa; Mil. Dict. 19.) "Leaflets in three pairs, egg-ſhaped, rounded, emarginate, equal." Linn. "Leaflets in three or four pairs, egg-ſhaped, almoſt entire; flowers in irregular racemes; ſtem arboreous." Swartz. A ſmall tree. *Trunk* ten or twelve feet high; branches round, aſh-coloured, pubeſcent. *Leaves* ſcattered, ſpreading; on round pubeſcent petioles, two inches long; leaflets petioled, blunt, nerved, thickiſh, tomentous, hoary underneath. *Flowers* yellow; racemes axillary, ſolitary, ſpreading, ſhorter than the leaves, many-flowered; three leaflets of the calyx larger, ovate-oblong, ſpreading, concave-arched, pubeſcent on the outſide; petals unequal; upper one larger, in ſhape of the letter S placed obliquely, concave, waved at the edge; filaments very ſhort, equal, awl-ſhaped; anthers thick, curved in, fertile. *Legume* flat, broad. Swartz. A native of Jamaica, where it is called the ſenna tree. Its leaves are purgative, and are ſometimes uſed inſtead of the true ſenna. The pulp of the legumes has the ſame flavour and the ſame medicinal qualities as caſſia fiſtula. 12. C. *obtuſifolia*, Linn. Sp. Pl. 8. Mart. 9. Lam. 11. Willd. 9. Swartz. Ob. 158. (C. americana foliis ſubrotundis; Tourn. 6. 9. C. fœtida; Dill. Elth. 71. tab. 62. fig. 72. Senna minor, Sloan. Jam. 2. p. 47. tab. 180. fig. 5.) "Leaflets in three pairs, egg-ſhaped, rather obtuſe." *Root* annual. *Stem* two feet high, cylindrical, ſmooth, greeniſh, herbaceous but ſtrong, branched. *Leaflets* a little narrowed towards the baſe, obtuſe, with a ſmall point at the ſummit, green, ſoft; upper ones larger; petioles a little villous; a conical gland between the lower pair. *Flowers* in ſhort axillary racemes near the top of the ſtem and branches. Lam. A native of the Weſt Indies. 13. C. *ſennoides*, Willd. 10. Ic. rar. 1. p. 70. Collect. 1. p. 74. "Leaflets in three pairs, elliptical, obtuſe, with a gland between the loweſt pair." A tree. *Stipules* awl-ſhaped. A native of the Eaſt Indies. 14. C. *acuminata*, Willd. 11. (C. apoucouira; Lam. 5. Aubl. guian. 1. p. 379. tab. 146.) "Leaflets in three pairs, egg-ſhaped, acuminate, with a ſeſſile gland between each pair." A tree. *Trunk* ſeven or eight inches in diameter, branches ſpreading. *Leaves* alternate; leaflets ſeſſile, ſmooth, the upper ones the largeſt; petiole winged, ending in a ſhort point. *Flowers* yellow, with red veins, in ſmall racemes which are either axillary or on the naked part of the ſtem and branches. A native of Guiana. 15. C. *corymboſa*, Lam. 12. Willd. 12. Bot. Mag. 633. "Leaflets in three pairs, lanceolate, ſomewhat falcate, ſmooth; a gland between the loweſt; corymbs peduncled, axillary, legumes cylindrical." A ſhrub. *Stem* about ſix feet high, brown, dotted, rough, about the thickneſs of a finger, branching near the top into a looſe but tolerably regular head. *Branches* ſmooth, cylindrical, greeniſh, ſmall. *Leaflets* green, quite ſmooth; upper ones longer, narrower, and moſt falcate. *Flowers* bright yellow, from five to ſeven in a corymb. *Legumes* inflated, cylindrical, an inch and half long, four lines thick, ſtraight, quite ſmooth. A native of South America about Buenos Ayres, deſcribed by La Marck from a living plant, and a dried ſpecimen of the legume gathered by Commerſon. 16. C. *villoſa*, Mart. 41. Miller Dict. 4. Houſt. MSS. "Leaflets in three pairs, oblong-ovate, equal, villous; pods jointed; ſtem erect, arboreous." A tree. *Trunk* fourteen or ſixteen feet high; branches numerous. *Flowers* pale ſtraw-colour, ſmall, in looſe terminal branches. *Legumes* long, narrow, jointed. *Seeds* oval, brown, each lodged in a ſort of iſthmus. A native of Campeachy. 17. C. *uniflora*, Mart. 42. Mil. Dict. 5. Houſt. MSS. "Leaflets in three pairs, ovate-acuminate, villous; flowers ſolitary, axillary; legumes erect." *Root* annual. *Stem* ſingle, ſeldom more than a foot high, herbaceous. *Flowers* pale yellow, ſmall. *Legumes* two inches long, narrow, taper. A native of Campeachy. 18. C. *longiſiliqua*, Linn. jun. Supp. p. 230. Mart. 11. Lam. 13. Willd. 13. (C. arboreſcens diffuſa; Brown Jam. p. 223.) "Leaflets in four pairs; upper ones lanceolate; an awl-ſhaped gland below the lower ones and between the upper ones." *Root* perennial. *Stem* erect, ſomewhat cylindrical, obtuſely furrowed; branches ſcarcely pubeſcent. *Leaflets* green, paler underneath, obovate-oblong, quite ſmooth; upper ones rather linear than lanceolate; an oblong-awl-ſhaped gland between or below the loweſt pair, a more acute one between the uppermoſt, ſeldom any between the intermediate ones; petiole erect, roundiſh. *Stipules* linear, acute, ſhort. *Legume* tetragonous, hairy, ſhort. It ſleeps during the night with its petioles cloſely erected, and its leaflets pendulous near the ſtem. A native of America. 19. C. *minima*, Mart. 45. (C. biflora; Mill. Dict. 14. Houſt. MSS.) "Leaflets in four pairs, oblong-ovate; ſtems procumbent; flowers axillary; peduncles two-flowered." *Root* annual. *Stems* two or three, ſlender, pubeſcent. *Leaflets* pale green, roundiſh. *Flowers* ſmall, yellow; peduncles jointed. 20. C. *falcata*, Linn. Sp. Pl. 10. Mart. 10. Lam. 14. Willd. 14. "Leaflets in four pairs, ovate-lanceolate, retrofalcate; a gland at the baſe of the petioles." *Root* annual. *Leaflets* tapering to the baſe, almoſt ſeſſile; the inner ſide broadeſt; outer ſide moſt narrowed near the baſe, ſo that they appear curved backwards. A native of America. 21. C. *ſericea*, Mart. 49. Willd. 15. Swartz. prod. 66. Flor. Ind. Occid. 2. p. 724. (C. ſenſitiva; Jacq. ic. rar. 3. tab. 459. Collect. 2. p. 362. Paiomirioba 2. Piſ. Braſ. 185.) "Leaflets in about four pairs, egg-ſhaped, hairy, with an awl-ſhaped gland between each pair; peduncles four-flowered; legumes tetragonal." *Root* annual. *Leaflets* ciliated. A native of Jamaica in open ſpots on the leſs elevated mountains. 22. C. *grandiflora*, (C. Chinenſis; Lam. 15. Vandzian-nam ſeu Telo-dzin-zan Sinenſium. Conf. Flos flavus.; Rumph. Amb. 4. p. 63. tab. 23.) "Leaflets in five pairs, egg-ſhaped, pubeſcent at the edges; peduncles axillary, ſhort, generally three-flowered; flowers large." *Stem* ſhrub-like, two or three feet high, herbaceous, erect, angular, a little villous at its ſummit. *Leaflets* green, ſoft, with a ſeſſile globular gland between the lower pair. *Flowers* bright yellow, remarkably large. Deſcribed by La Marck from a living plant, ſaid to come originally from China. As the Chinenſis of Willdenow appears to be a different ſpecies (ſee n. 37.), we have found it neceſſary to give a new trivial name to the preſent. 23. C. *ornithopoides*, Lam. 16. "Leaflets in four pairs, ovate-wedge-ſhaped, pointed; legumes linear, jointed, erect, tomentous, terminating in a recurved point." *Stem* a little angular, ſcarcely ligneous, covered near its ſummit with a ruſt-coloured down. *Leaves* alternate, ſhort; leaflets tomentous on both ſides; their edges, nerves, and petioles ruſt-coloured; a conical, awl-ſhaped gland between each pair; ſtipules long, awl-ſhaped, villous. *Flowers* in axillary racemes, ſhorter than the leaves. A native of South America, communicated to La Marck by Thouin. 24. C. *occidentalis*, Linn. Spec. Pl. 11. Mart. 12. Lam. 17. Willd. 16. (C. americana fœtida, foliis oblongis, glabris; Tourn. 619. Paiomirioba 1. Piſon. p. 185. Senna occidentalis; Comm. Hort. 1. p. 51. tab. 26. Sloan. Jam. hiſt. 2. p. 48. tab. 175. fig. 3, 4.) "Leaflets in five pairs, ovate-lanceolate, ſcabrous at the edges; outer ones larger, a gland at the baſe of the petioles." *Root* perennial, woody, fibrous, blackiſh, ſtriking deep into the earth. *Stem* herbaceous, two or three feet high, greeniſh, rough with irregularly ſcattered dots, ſcored downwards from each petiole with two grooves. *Leaflets* acuminate, ſmooth, fœtid, growing gradually larger to the upper ones; in old plants only three pairs. *Flowers* yellow, in looſe terminal racemes. *Legumes* from four to ſix inches long, three lines broad, a little compreſſed, ſlightly curved in the ſame manner as that of C. *falcata*. A native of Jamaica, where it is called ſtinking weed. It is eſteemed a powerful reſolvent, and uſeful ingredient in baths and fomentations for inflammations of the limbs. 25. C. *planiſiliqua*, Linn. Sp. Pl. 13. Mart. 13. Lam. 18. Willd. 17. (C. ſiliquis planis; Plum. Spec. 18. Burm. Amer. tab. 77.) "Leaflets in five pairs, ovate-lanceolate, ſmooth; a gland at the baſe of the petioles." A tree about the ſize of the common walnut tree. *Wood* firm, whitiſh; bark ſlightly wrinkled, dark brown. *Flowers* yellow, in terminal racemes. *Legumes* about a foot long, ſix or ſeven lines broad, compreſſed, a little curved, jointed. A native of Guadaloupe. 26. C. *fiſtula*, Linn. Sp. 14. Mart. 14. Lam. 19. Willd. 18. Rumph. Amb. 2. p. 83. tab. 21. Woodv. Med. Bot. tab. 163. Gært. tab. 147. fig. 1. (C. fiſtula alexandrina; Bauh. pin. 403. Tourn. 6, 9. Rai. hiſt. 1746. Caſſia nigra; Dod. pempt. 787. Conna, Rheed. Mal. 1. p. 37. tab. 22.) "Leaflets in five pairs, egg-ſhaped, acuminate, ſmooth; petioles without glands." A tree forty or fifty feet high. *Trunk* large, much branched. *Leaves* from three to five inches long, near two broad, equal at the baſe, lower ones largeſt, finely nerved, with a prominent midrib underneath, alternate, petioled; ſtipules ſcarcely apparent. *Flowers* large, yellow, veined, growing about five and twenty together in axillary racemes; partial peduncles two inches long, calyx ſmooth, three times ſhorter than the corolla; anthers oval, divided into two lobes at their baſe; germ ſlender, cylindrical, curved into a ſemicircle. *Legumes* about two feet long, cylindrical, dark brown, woody, with a longitudinal ſeam on one ſide, divided by tranſverſe partitions into numerous cells, each containing one ſeed lodged in a ſweetiſh black pulp. A native of Egypt, and almoſt all the warmer parts of the Eaſt Indies; and now naturalized in the Weſt Indies and South America. It is the caſſia ſolutiva of the Arab and Greek phyſicians of the middle ages, and its pulp has been very generally employed as a mild laxative, ſeldom producing uneaſineſs in the bowels, and therefore peculiarly proper for children and delicate or pregnant women. Dr. Cullen is of opinion that it does not differ from other ſweetiſh acid fruits, and that the pulp of prunes may be employed with equal effect. The pods of the Eaſt India caſſia are of leſs diameter, ſmoother, and afford a blacker, ſweeter, and more grateful pulp, than thoſe which are brought from the Weſt Indies, South America, or Egypt. The beſt pulp is of a bright ſhining black colour; and of a ſweet taſte, with a ſlight degree of acidity. It diſſolves both in water and rectified ſpirit; readily in the former, ſlowly in the latter, and not totally in either: the reſiduum has little or no activity. See Woodv. Med. Bot. p. 449. The officinal electuary of caſſia is directed to be prepared in the following manner: take of the freſh extracted pulp of caſſia, half a pound; manna, two ounces by weight; tamarind, one ounce by weight; roſe-ſyrup, half a pound. Beat the manna, and diſſolve it, in a water-bath ſaturated with ſea-ſalt, in the roſe-ſyrup; then add the pulps; and with the ſame degree of heat, evaporate the whole to an electuary of proper conſiſtence. The doſe of caſſia is from ℥ſs. to ℥i. Lond. Pharmac. 1796. 27. C *patula*, Mart. 46. Willd. 19. Hort. Kew. 2. p. 51. "Leaflets in five pairs, oblong, ſomewhat acute, ſmooth; a gland at the baſe of the petioles; branches with an even ſurface." *Root* perennial. *Leaflets* ſometimes in ſix pairs. It differs from C. occidentalis and planiſiliqua in the leaflets not tapering to the extremity. A native of the Weſt Indies, introduced into England in 1778. 28. C. *piloſa*, Linn. 12. Mart. 16. Lam. 21. Willd. 22. Swartz. Ob. 160. (C. ſuffruticoſa erecta hirſuta; Brown Jam. 224.) "Leaflets in five pairs, without glands; ſtipules ſemicordate, acuminate; ſtem ſtiff, hairy." *Stem* ſomewhat ſhrubby, from one to two feet high, upright, reddiſh; branches ſhort, nearly upright. *Leaflets* nearly ſeſſile, oblong, rounded at the tip, ſharp, with a very ſmall briſtle fixed obliquely to the petiole, veined, a little hirſute at the edges; common petioles thicker at the baſe, round, hirſute; glands extremely minute, concealed in the hairs under the loweſt pair of leaflets. *Flowers* yellow, axillary, two or three together, ſmall; peduncles one-flowered; petals nearly equal, with claws, concave. *Bractes* two, whitiſh. *Legumes* nearly cylindrical, linear, pubeſcent. A native of Jamaica. 29. C. *lineata*, Mart. 50. Willd. 20. Swartz. Prod. 66. Fl. Ind. Occ. 2. p. 726. "Leaflets in five pairs, ſomewhat oblong, pubeſcent underneath, nearly equal; an obſolete gland under the lower pair; peduncles one-flowered." *Root* perennial. *Stem* more ſhrubby and rigid, with leſs hairy branches, than the preceding ſpecies. *Peduncles* and *ſtipules* ſhort. *Legumes* linear. 30. C. *atomaria*, Linn. Mant. 68. Mart. 15. Lam. 20. Willd. 21. "Leaflets in five pairs, egg-ſhaped, ſomewhat tomentous; petioles round, without glands." *Stem* the height of a man, woody, aſh-coloured, much branched: little branches and petioles ſcarcely ſenſibly pubeſcent; petioles cylindrical, not channelled, beſprinkled with ſmall ruſt-coloured points. *Leaflets* green on both ſides, pubeſcent to the touch; lower ones not ſmaller, more obtuſe, ſomewhat emarginate, equal at the baſe; ſtipules awl-ſhaped, often permanent. 31. C. *fruteſcens*, Mart. 43. Mill. Dict. 2. Houſt. MSS. "Leaflets in five pairs, egg-ſhaped, ſmooth; outer ones longer; ſtem ſhrubby." *Stem* five or ſix feet high, much branched towards the top. *Flowers* yellow, in looſe racemes, lateral and terminal. *Legumes* long, taper. *Seeds* in a double row. 32. C. *arboreſcens*, Willd. 40. not of Miller. See n. 5. Vahl. Symb. 3. p. 56. (C. Glauca, Lam. Wellia Tagera Rheed. Mal. 6. p. 17. tab. 9, 10. "Leaflets in about five pairs, elliptical, ſmooth; an oblong gland between the loweſt; ſtipules awl-ſhaped, curved; racemes axillary." "Leaflets in ſix pairs, egg-ſhaped, glaucous and veined underneath; glands oblong, ſeveral; legumes linear, ſtraight, compreſſed, mucronate." Lam. A ſhrub five or ſix feet high. *Branches* pubeſcent at their ſummit. *Leaflets* two inches and a half long, more than one broad, a gland between each pair. *Flowers* yellow in axillary racemes at the ſummits of the branches. *Legumes* four or five inches long. Lam. A native of the Eaſt Indies. As both Willdenow and La Marck refer to Wellia-tagera of Rheed, we have put their ſpecies together; although we do not ſee how a ſhrub only ſix feet high can with any propriety be called arboreſcens. La Marck's deſcription was formed from ſpecimens in flower and young fruit ſent by Sonnerat. 33. C. *Senna*, Linn. Sp. Pl. 9. Mart. 17. Willd. 24. (C. lanceolata, Lam. 22. Forſkal Egypt. 85. n. 58. Senna officinalis; Gært. Senna alexandrina; Bauh. pin. 397. Tourn. 6, 8. Rai. hiſt. 1742. Moriſ. § 2. tab. 24. fig. 1. Sena orientalis; Tabern. ic. 517.) "Leaflets in five pairs, lanceolate, equal; a gland above the baſe of the petioles." Lam. from Forſkal. *Stems* from two to three feet high, ſomewhat woody; branches ſlender. *Leaves* alternate; leaflets an inch long, lively green, ſmooth, on ſhort petioles. *Flowers* pale yellow, in terminal racemes, on long peduncles. *Legumes* oblong, recurved, compreſſed. Lam. *Legumes* ovate-kidney-ſhaped, membranous, compreſſed, with foliaceous appendages, protuberant at the ſeat of the ſeeds; marked by capillary, tranſverſe, parallel ſtriæ; from ſix to nine-celled, two-valved; partitions tranſverſe, very thin. Gært. A native of Arabia and Upper Egypt, whence the leaves are brought to Grand Cairo; and as Alexandria is the port from which it is ſhipped for Europe, it has obtained the name of Alexandrian ſenna or ſena. The leaves of ſenna, as they are imported for medicinal uſe, have a rather diſagreeable ſmell and a ſomewhat acrid, bitteriſh, nauſeous taſte; they give out their virtue both to watery and ſpirituous menſtrua, communicating to water and proof ſpirit a browniſh colour, more or leſs deep according to the proportions, to rectified ſpirit a fine green. As far as is now known, it was firſt introduced as a purgative by the Arabian phyſicians Serapion and Meſue, who flouriſhed about the beginning of the ninth century. The firſt of the Greeks by whom it is noticed is Actuarius in the thirteenth. Actuarius, however, ſpeaks not of the leaves but the fruit. Meſue likewiſe ſeems to prefer the pod, as more efficacious than the leaf. In fact the pod purges leſs powerfully than the leaves, but has the advantage of not griping the bowels, like the leaves, and of being without their nauſeous bitterneſs. For covering the taſte of ſenna, Dr. Cullen recommends coriander ſeeds; and for preventing its griping, the warmer aromatics, as cardamoms or ginger. The formulæ of ſenna given by the colleges, are thoſe of an infuſion, a powder, a tincture, and an electuary. See Woodville's Medical Botany.

The London Pharmacopœia, 1796, directs the ſimple infuſion of ſenna to be prepared by macerating 1½ oz. by weight of ſenna, 1 dram of powdered ginger by weight, and one pint of boiling diſtilled water, for one hour, in a covered veſſel, and ſtraining the liquor, when cold. For the tartariſed infuſion of ſenna, take of ſenna 1½ oz. by weight, bruiſed coriander ½ an ounce by weight, cryſtals of tartar 2 drams by weight, and one pint of diſtilled water. Boil the cryſtals of tartar in the water, until they are diſſolved; then pour the water, yet boiling, upon the ſenna and ſeeds; macerate for an hour in a covered veſſel,

ſel, and ſtrain when cold. Both the preceding infuſions are mildly purgative to adults in the doſe of an ounce and an half, or two ounces; the nauſeous flavour of the ſenna is more covered in the latter; and perhaps would be ſtill more ſo by the addition of ſugar.

For the compound powder of ſenna, take ſenna and cryſtals of tartar of each 2 ounces by weight, ſcammony, $\frac{1}{2}$ an ounce by weight, and ginger 2 drams by weight; rub the ſcammony ſeparately, and the reſt together, into powder, and then mix them.

For the tincture, take of ſenna 1lb., carraway bruiſed $1\frac{1}{2}$ oz. by weight, leſſer cardamoms bruiſed $\frac{1}{2}$ an oz. by weight, raiſins ſtoned, 16 oz. by weight, and proof-ſpirit of wine, one gallon. Digeſt for 14 days, and ſtrain.

For the extract, take of ſenna 1lb., and diſtilled water, one gallon. Boil the ſenna in the diſtilled water, adding, after its decoction, a little rectified ſpirit of wine. Evaporate the ſtrained liquor to a proper conſiſtence. The ſpirit may be added when the decoction is reduced to one half, or to 3 pints. The extract is given as a gentle purgative, from 10 grains to a ſcruple; or, in leſs quantity, as an aſſiſtant to the milder laxatives.

34. C. *Italica*, (c. ſenna, Lam. 23. c. ſenna β. Linn. Senna Italica, Bauh. pin. p. 397. Tourn. p. 618. Rai. hiſt. 1742. Senna Dod. pempt. 361. Lob. ic. 2. p. 88. Burm. Ind. tab. 33. fig. 2.) "Leaflets in ſix pairs, inverſely egg-ſhaped; petioles without glands." *Root* annual. *Stem* a foot and half high, but little branched. *Leaves* alternate; leaflets green above, rather glaucous and ſlightly pubeſcent underneath, unequal at their baſe, larger than thoſe of the preceding ſpecies, from which they are alſo deciſively diſtinguiſhed by the obtuſeneſs of their ſummit. *Flowers* pale yellow, with purple veins, in terminal and axillary racemes; peduncles long; calyx-leaves reflexed. *Legumes* oval-oblong, compreſſed, curved upwards. Suppoſed to be a native of the northern part of Africa, and the Levant. It is cultivated on a large ſcale in Italy for medical purpoſes, and has been naturalized in the Weſt Indies, where it is applied to the ſame uſe. It poſſeſſes the ſame qualities as C. lanceolata, but is leſs powerful, and requires to be taken in larger doſes. La Marck has followed Forſkal in conſidering the two kinds as ſpecifically diſtinct, but has perverſely given ſenna as a trivial name, to the variety β. of Linnæus, at the ſame time that he maintains, the other plant to be the real ſenna of Alexandria. 35. C. *ruſcifolia*, Mart. 19. Willd. 25. Jac. ic. rar. 1. tab. 71. Collect. 1. p. 43. "Leaflets in ſix pairs, lanceolate, acute, ſmooth; a gland above the baſe of the rib; peduncles many-flowered." A ſhrub about the height of a man. *Stem* erect, round. *Leaflets* on ſhort petioles, upper ones gradually larger. *Flowers* yellow, in ſolitary axillary racemes near the ends of the branches. *Legume* ſtraight, a little compreſſed, ſmooth, ending in a blunt roundiſh beak, about four inches long. *Seeds* ovate, ſhining, black, a little compreſſed, with ſcarcely any pulp. A native of the Iſland of Madeira. 36. C. *biflora*, Linn. Sp. Pl. 15. Mart. 18. Lam. 24. Willd. 26. Bot. mag. 810. (not of Miller, ſee n. 19.) C. fruticoſa foliis minoribus, floribus geminis, &c. Brown. Jam. 223. C. minor fruteſcens; Plum. ſpec. 18. ic. 78. fig. 1. Burm. Am. 78. fig. 1.) "Leaflets in ſix pairs, rather oblong, ſmooth; lower ones ſmaller; an awl-ſhaped gland between the loweſt; pedicels generally two-flowered." A ſmall ſhrub. *Branches* numerous, ſlender, quite ſmooth, growing near together. *Leaflets* obtuſe, with a very ſmall briſtle-ſhaped point, the largeſt not more than an inch long. *Flowers* yellow, in looſe axillary racemes. *Legumes* ſtraight, linear, compreſſed, blackiſh, three or four inches long. A native of the Weſt Indies. 37. C. *Chinenſis*, Willd. 27. (not of La Marck, ſee n. 22.) Jacq. ic. rar. 1. tab. 73. Collect. 1. p. 64. "Leaflets in about ſix pairs, egg-ſhaped, acute, ſmooth; a gland at the baſe of the petiole; legume cylindrical, uncinate, tranſverſely ribbed. A native of China about Pekin. 38. C. *multiglanduloſa*, Mart. 21. Willd. 28. Jacq. ic. rar. 1. tab. 72. Collect. 1. p. 42. "Leaflets in about ſix pairs, oval-oblong, obtuſe, hairy, outer ones larger; an awl-ſhaped gland between each pair; legumes linear." A ſhrub about the height of a man. Young branches, petioles, peduncles, under ſurface and edges of the leaves villous. *Leaflets* on very ſhort peduncles, blunt, with a ſmall point. *Flowers* yellow, in terminal racemes; calyx-leaves villous, concave, yellow, very blunt, ſpreading, unequal; petals blunt, almoſt twice as large as the calyx; three upper ones very large. *Legume* linear, browniſh aſh-colour, ſlightly villous and ſoft to the touch, blunt, ſwoln with the ſeeds, about three inches long. *Seeds* ſomewhat egg-ſhaped, blunt, ſcarcely compreſſed, black, ſhining, without pulp. Hort. Kew. Found by Maſſon in the gardens of Teneriffe and introduced by him into England in 1779. 39. C. *hirſuta*, Linn. Sp. Pl. 16. Mart. 20. Lam. 25. Willd. 29. (C. americana fœtida, foliis amplioribus villoſis, Tourn. Inſt. 619.) "Leaves in ſix pairs, broadly egg-ſhaped, acuminate, woolly." Nearly allied to C. occidentalis, and differing from it chiefly in its woollyneſs. 40. C. *tomentoſa*, Linn. jun. ſupp. 231. Mart. 22. Willd. 30. Lam. 29? "Leaflets in ſix to eight pairs, obliquely rounded at the baſe, hairy above; panicles axillary; legumes villous." Linn. jun. "Leaflets in ſix to eight pairs, oblong-egg-ſhaped, mucronate, tomentous underneath; awl-ſhaped glands ſeveral; racemes axillary; legumes tomentous." Lam. A tree. *Branches* woody, round, zigzag; cloathed with a denſe, ſoft, white down, which becomes yellow when dry. *Leaflets* linear-lanceolate, acute, quite entire, green above, white or yellow underneath, tomentous. *Stipules* ſemilunar or lanceolate, tomentous, deciduous. *Flowers* yellow. *Legumes* ſtraight, compreſſed, very tomentous. A native of South America. Mutis. La Marck's plant was found in Brazil by Commerſon, and deſcribed by him from a living one in the royal garden at Paris. It appears to differ from that of Mutis only in the form of the leaflets. 41. C. *ſerpens*. Linn. Sp. Pl. 17. Mart. 23. Lam. 26. Willd. 31. Swartz obſ. 161. Brown Jam. 225. n. 15. Sloane Jam. 2. 5. "Leaflets in ſeven pairs; flowers pentandrous; ſtems filiform, proſtrate, herbaceous." *Root* annual. *Stems* three or four inches long, generally ſimple, ſtiff, round, villous. *Leaflets* ſomewhat ſickle-ſhaped, ſeſſile, approximating, flat, oblique, terminated by a ſhort briſtle, ſomewhat villous; common petioles ſhort, hirſute; glands two, red, flat, ſeſſile, roundiſh, perforated, ſituated beneath the loweſt pair of leaflets. *Stipules* two, oppoſite, oblique, lanceolate, acuminate. *Flowers* yellow, not axillary, but crowded above the petioles, on very ſhort peduncles; calyx-leaves lanceolate, ſpreading; petals unequal, egg-ſhaped, obtuſe, concave, ſpreading; filaments ſhort; anthers linear, fertile; the three anterior ones bent down and ſomewhat larger, germ compreſſed, oblong; ſtyle thickiſh; ſtigma blunt, pubeſcent. *Legume* flat, compreſſed, of a broad linear ſhape, margined, blunt, villous, many-ſeeded. A native of Jamaica, in paſtures, creeping among the graſs. Swartz. 42. C. *mexicana*, Willd. 32. Jacq. hort. Schœn. 2. p. 41. tab. 23. "Leaflets in ſeven pairs, rather obtuſe, pubeſcent, ciliated; a cylindrical gland between the loweſt." A native of Mexico.

43. C. *anguſtifolia*, Willd. 33. Vahl. Symb. 1. p. 29. "Leaflets in ſeven pairs, lanceolate; outer ones larger; petioles without glands; ſtem ſhrubby." It differs from C. ſenna in the number and form of the leaflets, and in the mature legumes not being curved inward; from C. liguſtrina in its larger outer leaflets, and petioles without glands. Vahl. 44. C. *liguſtrina*, Linn. Sp. Pl. 18. Mart. 24. Lam. 27. Willd. 34. (Senna liguſtri folio, Plum. ſpec. 18. Tourn. 619. Dill. Elth. 350. tab. 259. fig. 338. Caſſia Bahamenſis Mart. Cent. tab. 21.) "Leaflets in ſeven pairs, lanceolate; outer ones ſmaller; a gland at the baſe of the petioles." A ſhrub ſix or ſeven feet high, the thickneſs of the little finger, ſlightly angular; branches numerous, deeply ſtriated axills, upper part of the ſtem, edges, and back of the leaves finely pubeſcent. *Flowers* yellow, in axillary racemes near the top of the ſtem, peduncled. *Legumes* two inches long or more, one inch broad, oblong, compreſſed, a little curved upwards. A native of Martinico, the Bahama iſles and Virginia. 45. C. *florida*, Willd. 35. Vahl. Symb. 3. p. 57. "Leaflets in ſeven pairs, oval-oblong, ſmooth, emarginate, without glands; flowers in racemes; bractes ſpatula-ſhaped, mucronate. A native of the Eaſt Indies. 46. C. *ſtipulacea*, Willd. 36. Mart. 47. Hort. Kew. 2. p. 52. Feuill. peruv. 3. p. 56. tab. 42. "Leaves in about eight pairs, ovate-lanceolate; a gland between the loweſt pair; ſtipules ovate, very large." A native of Chili introduced by Thouin in 1786. 47. C. *alata*, Linn. Sp. Pl. 19. Mart. 25. Lam. 30. Willd. 37. Swartz obſerv. 162. (Herpetica, Rumph. amb. 7. p. 35. tab. 58. C. herpetica, Jacq. obſ. 2. p. 24. tab. 45. fig. 2. Plum. ſpec. 18. Sloane Jam. hiſt. 2. p. 59. tab. 175. fig. 2. C. bracteata, Linn. jun. Sup.?) "Leaflets in eight pairs, oval-oblong; inner ones ſmaller; petioles without glands; ſtipules ſpreading." Linn. "Leaflets in eight pairs, oval-oblong, obtuſe, mucronate; petioles without glands; legumes with two wings." Lam. Stems ſeveral, ſomewhat woody, from ſix to nine feet high, about the thickneſs of a finger, cylindrical, ſmooth, a little twiſted, and branched towards the top. *Leaves* alternate, from a foot to a foot and a half long; leaflets near two inches and a half long, one inch broad, near together, quite ſmooth. *Flowers* yellow, in terminal racemes; bractes roundiſh-ovate, concave, entire, the colour of the flowers, looſely imbricate, reſembling ſcales; calyx-leaves oblong, concave, coloured, tender; petals unequal, roundiſh, with claws, concave, entire; the fifth a little larger, waved with a fringed border. *Legumes* five or ſix inches long, quadrangular; oppoſite angles winged; margin crenate. *Seeds* ſeparated by alternate, membranous partitions, rhomboidal, compreſſed. Mill. and Lam. The juice of the leaves or buds is ſaid to cure the ringworm. A native of the Eaſt and Weſt Indies. 48. C. *marilandica*, Linn. Sp. Pl. 20. Mart. 26. Lam. 31. Willd. 38. Dill. Elth. 351. tab. 260. fig. 339. Mart. Cent. tab. 23. "Leaflets in eight pairs, ovate-oblong, equal; a gland at the baſe of the petioles." *Root* perennial. Stems ſeveral, three or four feet high, often ſimple, herbaceous, cylindrical, either entirely ſmooth, or furniſhed with a few hairs. *Leaves* alternate, rather long, green above, and pale underneath. *Flowers* bright yellow, in ſhort axillary racemes on the upper part of the ſtem. *Legumes* three or four inches long, a little curved, mucronate, bordered with conſpicuous joints, and a few ſcattered reddiſh hairs. A native of Maryland and Virginia. 49. C. *ſuratenſis*, Lam. 32. Burm. Fl. Ind. 97. "Leaflets in eight pairs, ovate-oblong, obtuſe, emarginate; lower ones ſmaller; a pedicelled gland at the baſe of the loweſt pair." *Stem* herbaceous. *Stipules* two, linear-lanceolate, at the baſe of each petiole. *Flowers* large, orange; peduncles axillary; bractes heart-ſhaped, acute. A native of the neighbourhood of Surat. 50. C. *faſtigiata*, Willd. 39. Vahl Symb. 3. p. 57. "Leaves in nine pairs, oblong, ſmooth; a pedicelled gland between every pair of leaflets; flowers in racemes." *Root* perennial. A native of the Eaſt Indies. 51. C. *frondoſa*, Mart. 48. Willd. 40. Hort. Kew. 2. p. 35. (C. [illegible], Jacq. Ic. Rar. 1. tab. 74. Collect. 1. p. 82.) "Leaflets in nine pairs, oval-oblong, ſmooth, rather obtuſe, a cylindrical gland between the loweſt; petiole without any gland at the baſe." *Root* perennial. 52. C. *tenuiſſima*, Linn. Sp. Pl. 21. Mart. 27. Lam. 33. Willd. 41. Roy. Lugd. 478. "Leaflets in nine pairs, oblong; an awl-ſhaped gland between the loweſt." *Root* perennial. A native of the Havanna. La Marck obſerves that he has ſeen in the Herbarium of Juſſieu a plant under this name, reſembling C. chamæcriſta, but with only nine pairs of leaflets. The peduncles are axillary, one-flowered, ſhorter than the leaves; the calyx-leaves very acute, and as long as the petals. 53. C. *ſiamea*, Lam. 34. "Leaflets in eight or nine pairs, ovate-oblong, obtuſe, ſmooth; petioles without glands; corymbs peduncled, axillary, and terminal. A tree. *Leaflets* almoſt emarginate, coriaceous, on ſhort petioles. *Legumes* ſix or ſeven inches long, flat, bordered. According to Commerſon, it is cultivated in the iſland of Ceylon for the beauty of its flowers. 54. C. *virgata*, Mart. 51. Willd. 42. Swartz Prod. 66. Fl. Ind. Occid. 2. p. 728. "Leaflets in ten pairs, ovate-lanceolate, villous; a petiolar pedicelled gland; peduncles one-flowered, longer than the leaflets." A native of Jamaica and Hiſpaniola. Nearly allied to C. chamæcriſta, but differs in having a ſhrubby branched ſtem; rigid, ſomewhat zigzag, erect branches; and narrower, more acute leaflets. 54. C. *ſophera*, Linn. Sp. Pl. 22. Mart. 28. Lam. 35. Willd. 43. Lour. Cochinc. 264. (Senna, Burm. Zeyl. 213. tab. 98. Galegæ affinis, Bauh. Pin. 352. Gallinaria acutifolia, Rumph. Amb. 5. p. 283. tab. 97. fig. 1. Ponnam-Tagera, Rheed. Mal. 2. p. 101. tab. 52. "Leaflets in ten pairs, lanceolate; an oblong gland at the baſe." A ſhrub, from three to five feet high; branches cylindrical, ſmooth. *Leaves* an inch and half long; leaflets ſlightly villous at their edges. *Flowers* pale yellow, veined, in ſhort axillary racemes or corymbs. *Legumes* three inches and a half long, two lines broad, compreſſed, linear, mucronate, nearly ſmooth, ſomewhat reſembling thoſe of C. occidentalis. A native of the Eaſt Indies, China, and the iſland of Tongatabu in the South Seas. 56. C. *anguſtiſiliqua*, Lam. 36. Plum. Spec. 18. Burm. Amer. tab. 78. fig. 2. "Leaflets in ten pairs, ovate-oblong, acute, awned; a pedicelled gland between the loweſt; legumes narrow, compreſſed." A ſhrub. *Leaflets* ſmooth above, a little villous underneath. *Flowers* yellow, large, in compound, terminal, and axillary racemes. *Legumes* from three to five inches long, blackiſh, ſtraight. A native of the iſland of St. Domingo. 57. C. *auriculata*, Linn. Sp. Pl. 23. Mart. 30. Lam. 37. Willd. 45. (Senna ſpuria, Pluk. Alm. 341. tab. 314. fig. 4.) "Leaflets in twelve pairs, obtuſe, mucronate; glands ſeveral, awl-ſhaped; ſtipules kidney-ſhaped, bearded. A ſhrub. *Branches* ligneous, a little pubeſcent towards their ſummit. *Leaflets* oval-oblong, ſomewhat villous underneath; ſtipules large, embracing the ſtem, very obtuſe, with one particular briſtle on each ſide. *Flowers* orange, very large, growing from three to five together, in ſhort terminal bunches. *Legumes* compreſſed, ſlender, almoſt ſmooth, narrowed at the baſe, obtuſe, terminated by a thread ſhaped point. A native of the Eaſt Indies. 58. C. *brevifolia*, Lam. 48. Willd. 46. "Stem much branched, nearly ſmooth; leaflets in twelve pairs, inverſely egg-ſhaped; peduncles lateral, one-flowered, longer than the leaves." *Stem* woody, from three to five inches long; branches very

ſlender. *Leaves* five or ſix lines long; leaflets very ſmall, growing near together. *Legumes* an inch long, compreſſed, almoſt ſmooth. A native of the iſland of Madagaſcar. 59. C. *javanica*, Linn. Sp. Pl. 24. Mart. 31. Lam. 38. Willd. 48. Vahl. Symb. 3. p. 58. (C. fiſtula javanica, Comm. Hort. 1. p. 217. tab. 111. C. fiſtula ſylveſtris, Rumph. Amb. 2. p. 88. tab. 22.) "Leaflets in twelve pairs, oblong, obtuſe, ſmooth; gland none." Linn. "Leaflets from twelve to fifteen pairs, egg-ſhaped, obtuſe, ſmooth; legumes nearly cylindrical, very ſmooth." Lam. A lofty tree. *Flowers* red or yellowiſh, in ſhort racemes. *Legumes* longer and more ſlender than thoſe of C. fiſtula, divided into numerous cells by tranſverſe partitions, without any ſucculent pulp. A native of Java and the Molucca iſlands. 60. C. *braſiliana*, Lam. 39. (C. grandis, Linn. jun. and Willd. excluding the ſynonym. C. mollis, Vahl.? C. fiſtula flore incarnato, Breyn. Cent. 1. p. 58. tab. 21. C. fiſtula braſiliana, Bauh. Pin. 403. Tourn. 619. Rai. Hiſt. 1747.) "Leaflets from fifteen to twenty pairs; leaflets oblong, obtuſe, pubeſcent; legumes very large, thick, compreſſed, ſword-ſhaped." Lam. A large tree. *Branches* extending widely on every ſide; little branches covered with a fine down. *Leaves* large; leaflets near together; common petiole nine or ten inches long, without any gland. *Flowers* fleſh-coloured, in ſimple axillary racemes, ſhorter than the leaves. *Legumes* a foot and half or two feet long, at leaſt three inches broad; with one ſuture double, the other ſingle, in ſome degree reſembling a ſabre; many-celled, containing a brown or blackiſh pulp, ſimilar to that of C. fiſtula, but bitter and diſagreeable. A native of Braſil and Surinam. 61. C. *nigricans*, Willd. 50. Vahl. Symb. 1. p. 30. (C. procumbens, Forſk. Arab. p. 111.) "Leaflets in twelve pairs, linear-oblong, very obtuſe, mucronate; a ſeſſile gland at the baſe." Perennial. A native of Arabia Felix. 62. C. *polyphylla*, Willd. 51. Jacq. Ic. Rar. 3. tab. 460. Collect. 4. p. 104. "Leaflets in many pairs, elliptical, obtuſe, ciliated; an oblong, ſeſſile gland between the loweſt; peduncles often two-flowered." A native of the iſland of Porto Rico. Perennial. 63. C. *Chamæcriſta*, Linn. Sp. Pl. 25. Mart. 33. Lam. 40. Willd. 52. Bot. Mag. 107. (C. ſuffruticoſa erecta, &c. Brown Jam. 225. Chamæcriſta pavonis major, Commel. Hort. 1. p. 53. tab. 37.) "Leaflets in many pairs; a petiolar pedicelled gland; ſtipules ſword-ſhaped." *Root* annual. *Stem* a foot and half high, cylindrical, pubeſcent, branched from the bottom. *Flowers* yellowiſh; the two upper petals with a purple ſpot; peduncles axillary, ſolitary, or ſometimes two together, one-flowered, ſhorter than the leaves. A native of Jamaica, Barbadoes, and Virginia. 64. C. *glanduloſa*, Linn. Sp. Pl. 26. Mart. 34. Lam. 41. Willd. 53. (Chamæcriſta pavonis americana, Breyn. Cent. 66. tab. 24.?) "Leaflets in many pairs, with many glands; ſtipules awl-ſhaped." *Stems* a foot high, ſlender, ſomewhat ſhrubby. *Leaflets* lanceolate. *Flowers* hexandrous; two of the anthers very long; peduncles axillary, in pairs, one-flowered, ſhorter than the leaf. 65. C. *mimoſoides*, Linn. Sp. Pl. 42. Mart. 35. Lam. 42. Willd. 54. "Leaflets in many pairs, linear: an obſolete gland at the baſe of the petioles; ſtipules briſtle-ſhaped." Stem two feet high, erect, ſimple, cylindrical; peduncles axillary, as long as the leaves, in pairs, one-flowered, furniſhed a little below the flower with two ſmall, lanceolate, acute bractes. *Legumes* linear. A native of the iſland of Ceylon. 66. C. *microphylla*, Willd. 55. "Leaflets in many pairs, linear, mucronate; a gland between the loweſt; ſtipules lanceolate, mucronate; peduncles ſolitary, one-flowered; ſtem with rod-like branches. *Stem* pubeſcent. *Legume* compreſſed, linear, clothed with a fine down. Nearly allied to the preceding, but thought by Vahl to be diſtinct. A native of the iſland of St. Crux. 67. C. *flexuoſa*, Linn. Sp. Pl. 28. Mart. 36. Lam. 43. Willd. 56. (Chamæcriſta, Breyn. Cent. 64. tab. 23.) "Leaflets in many pairs; ſtipules half heart-ſhaped. *Root* annual. *Stem* ſlender, a little angular, zigzag. *Leaves* long, narrow; leaflets linear-lanceolate, three-nerved, pale green, crowded; ſtipules large, acute, nerved. *Peduncles* ſolitary, axillary, one-flowered. A native of Braſil. 68. C. *anguſtiſſima*, Lam. 44. "Leaflets in many pairs, very ſmall, awned; ſtipules lanceolate-briſtle-ſhaped; peduncles in pairs, or two-cleft; ſtem hairy." *Root* annual. *Stem* ſlender, cylindrical, villous, a little branched, not zigzag. *Leaves* long, very narrow, villous; leaflets linear, crowded. *Peduncles* lateral, a little above the axils of the leaves. *Legumes* linear, compreſſed. Obſerved in the iſland of Java by Commerſon. 69. C. *capenſis*, Willd. 57. Thunb. Prod. 79. "Leaflets in many pairs, linear; ſtem erect, zigzag, villous." A native of the Cape of Good Hope. 70. C. *nictitans*, Linn. Sp. Pl. 29. Mart. 37. Lam. 45. Willd. 58. Hort. Clif. 497. tab. 36. (Senna ſpuria virginica, Pluk. Alm. 341. tab. 314. fig. 5. Amæna mæſta, Rumph. Amb. 6. p. 147. tab. 161. fig. 1.) "Leaflets in many pairs; flowers pentandrous; ſtem rather erect." *Root* annual. *Stem* from eight to ten inches high, ſlender, ſlightly villous, a little branched. *Leaflets* in twelve to fifteen pairs, oblong, obtuſe, with a briſtle-ſhaped point, crowded; with a brown, pedicelled gland a little below the loweſt pair. *Flowers* pale yellow, ſmall, axillary, ſolitary, on very ſhort peduncles; the lower petal larger and more open than the others. A native of Virginia. 71. C. *procumbens*, Linn. Sp. Pl. 30. Mart. 38. Lam. 46. Willd. 59. (C. americana procumbens, Comm. Petrop. tab. 11.) "Leaflets in many pairs, without glands; ſtem procumbent." *Root* annual. *Stem* herbaceous. *Flowers* ſmall. *Legumes* narrow, compreſſed. A native of Virginia. 72. C. *pumila*, Lam. 47. (Mimoſa pumila, Pluk. 252. tab. 120. fig. 1.) "Stem hairy, much branched; leaflets in many pairs, ciliated at the baſe; a petiolar pedicelled gland; flowers very ſmall." *Stem* divided from its baſe into many ſlender branches, three or four inches long, ſpreading on the ground. *Leaflets* oblong, acute, villous underneath, crowded. *Flowers* axillary, generally in pairs, on very ſhort peduncles. *Legumes* near an inch long, ſomewhat villous. A native of China and the Eaſt Indies.

*Propagation and Culture.* Some ſpecies of Caſſia are cultivated for their beauty, and others for their rarity. They are all propagated by ſeeds, but as they are natives of warm climates, they muſt be raiſed in hot-beds. Such as grow naturally between the Tropics, require the protection of a ſtove; and few will endure the rigour of our winters in the open air. The ſeeds of Caſſia fiſtula may be procured from the druggiſts, who import the pods for officinal purpoſes.

Cassia *cinnamomea*, Herm. Lugd. See Laurus *cinnamomum.*

Cassia *malabarica*, Herm. Lugd.—*Lignea*, Black.—*cinnamomea*, Pluk. Alm. 88, 89. See Laurus *caſſia.*

Cassia *lignea jamaicenſis* & *cinnamomea barbadenſium*, Pluk. Alm. See Canella *alba.*

Cassia, in *Geography*, a country of Sumatra, the inhabitants of which live in villages, independent of one another, and are always at war. See Sumatra.

Cassia *flake*, in the *Glaſs Trade*, is that iron with a piece of wood placed on it, on which they lay the glaſs after they have taken it off the pipes, and on which they turn the glaſs, to faſten the pontee to it.

CASSIAN, John, in *Biography*, an eccleſiaſtical writer of the claſs of monks, was moſt probably born in Scythia, though others ſay that he was a native of France, and others of Africa. He was brought up in the monaſtery of Bethlehem, where he formed an intimacy with a monk named Germanus; and from whence they went together into Paleſtine and Egypt, and paſſed ſeven years with the ſolitaries of the Thebais. The theological diſputes that prevailed even in theſe deſerts, occaſioned their withdrawing to Conſtantinople, where Caſſian was ordained deacon by St. Chryſoſtom. Upon the expulſion of this prelate from his ſee, he was deputed, together with Germanus, in 403, to lay the complaints of the church before pope Innocent I., by whom he was ordained prieſt. When Rome was taken by Alaric, he removed to Provence, and in 410 fixed at Marſeilles. Here he founded two monaſteries, one for each ſex, and inculcated in Gaul, both by his diſcourſe and writings, the opinions of the Semipelagians on the doctrine of grace, together with the rules of diſcipline which were obſerved among the Syrian and Egyptian monks; and here he is ſuppoſed to have died, between the years 430 and 433. His works, ſome of which detailed the mode of living among the Egyptian monks, and the diſcourſes of their moſt famous abbots, were publiſhed in folio at Frankfort, in 1722, with a large commentary by Alardus Gazæus. Caſſian has been regarded as a ſaint by ſeveral popes; and though he was never canonized by the church, his memory has been ſo much revered in Provence, that a day was obſerved as his feſtival; and his works were held in very high eſtimation by the devotees of the church of Rome. Du Pin. Eccl. Hiſt. 5th century, vol. ii. Moſheim, E. H. vol. ii.

CASSIANI, a ſect in *Civil Law*, who adhered to the ſyſtem and interpretations of Caſſius, a celebrated lawyer, in oppoſition to thoſe of Pegaſus, a timid ſlave of Domitian, who derived his name from the galley which his father commanded, whoſe adherents were denominated Pegaſiani. Theſe parties were alſo denominated Sabinians and Proculians. See Capito. The popular cauſe was in the hands of Pegaſus, while the favourite of the Cæſars was repreſented by Caſſius, who gloried in his deſcent from the patriot aſſaſſin. Tacit. Annal. xvii. 7. Sueton. in Nerone, c. 37.

CASSIANISM, from *Caſſian*, a teacher in Gaul to thoſe who were called Semipelagians towards the cloſe of the fifth century, is ſometimes uſed for Semipelagianiſm. See Cassian.

CASSICAN, in *Ornithology*, caſſican de la nouvelle Guinée, Buffon: the pied roller of Latham, Coracias *varia*, which ſee.

CASSICUS. Briſſon calls the oriolus Perſicus by this name, caſſicus luteus. See Oriolus *Perſicus*.

CASSIDA, in *Botany*, Tourn. Hall. Ray. Petiv. See Scutellaria.

CASSIDA, in *Entomology*, a genus of coleopterous inſects, which, according to Linnæus, have moniliform antennæ that become rather thicker towards the end: thorax and wing-caſes with a broad margin, the former flat, and forming a kind of ſhield, beneath which the head is concealed. To this Mr. Marſham adds, that the body is oval, convex, and flat beneath. Marſh. Ent. Brit. The Fabrician character as uſual is taken principally from the parts and ſtructure of the mouth: he obſerves that the anterior feelers are clavated, and thoſe behind filiform; lip elongated and entire, and the antennæ moniliform.

The above are the eſſential characters of this genus, to which a few general particulars may be added. The rotundate figure of the body, gibbous back, and flattened ſurface beneath are a ſtrong criterion of this genus. The ſurface above is commonly ſmooth, and in ſome ſpecies gloſſy; eyes oval, and placed near each other; antennæ inſerted between the eyes; ſcutel triangular and ſmall; wing-caſes ſame length as the abdomen; legs ſhort, thighs compreſſed, ſhanks rounded, and the tarſi conſiſting of four joints. Many of the ſpecies are very beautiful when alive, ſome of which retain their brilliancy of colours in the height of perfection after death; in others, however, and thoſe eſpecially of a ſmall ſize, theſe are altogether evaneſcent, their rich metallic or golden hues fading as the inſect dies, and totally diſappearing in the dried ſpecimens. Caſſidæ immerſed in ſpirit of wine alive, are obſerved to retain the ſplendour of thoſe golden hues for years in as high perfection as they appear in the living inſect: but if taken out and allowed to dry, theſe change colour in the ſame manner as the inſect would in dying without being ſteeped in ſpirits. For immediate obſervation, the true colours of the living inſect may however be revived in the dried ſpecimens at any time by leaving them for the ſpace of fifteen or twenty minutes in warm water; the colours re-appearing while the inſect is kept moiſt, and fading again as the inſect dries.

The larvæ of the caſſidæ are commonly found concealed on the under ſurface of the leaves of the plants on which they feed, and often hide themſelves under a cover of their own excrements, which they ſupport in the air above their bodies by means of their lateral ſpines, and the briſtles at the extremity of their tail to ſhelter themſelves from the ſun and rain. The larvæ caſt their ſkins ſeveral times before they paſs into the pupa ſtate. The perfect female inſect depoſits the eggs in regular order on the leaves of plants, and covers them with excrements to conceal them. The common Engliſh name of the inſects of this tribe is the tortoiſe beetle. We have only an inconſiderable number of the ſpecies indigenous to this country, and thoſe only of a ſmall ſize; many of the larger kinds, and thoſe diſtinguiſhed for their vivid hues and colours are natives of South America. The following ſpecies are deſcribed by authors.

Viridis. Green ſprinkled with confluent dots. Marſh. Ent. Brit. Caſſida viridis. Linn. La caſſide verte of Geoffroy. Frequent on thiſtles in Europe. Length one third of an inch.

Cruentata. Green, with a ſanguineous dot near the baſe of the wing-caſes. Inhabits Europe. Donov. Brit. Inſ. Caſſida ſanguinolenta of Paykull.

Similis. Green; wing-caſes ſtriate with dots. Found on anthemide cotula. Marſh.

Obſ. Perhaps caſſida praſina of Herbſt. Inhabits Europe.

Spergulæ. Pale green; ſhield ſmooth; wing-caſes ſtriate with impreſſed dots. Diſcovered by Mr. Kirby. Marſh. Ent. Brit.

Murraea. Black; ſhield red; wing-caſes ſanguineous, ſprinkled with black dots; named by Fabricius after Murray. Size of caſſida viridis, and inhabits Europe.

Liriophora. Black, above green; thorax emarginate; ſuture and two dots on the ſhells black.

Equestris. Green; a ſilvery ſtreak at the top of the wing-caſes; abdomen black, with a pale border. Olivier. A native of Germany: found on the water mint.

Nebulosa. Pale clouded and dotted with brown. Linn. Found on thiſtles in Europe.

Maculata. Greeniſh, with numerous black ſpots on the dorſal ſuture of the wing-caſes. Donov. Brit. Inſ.

Nobilis. Greeniſh-grey, with a ſhining blue line on the wing-caſes. Found principally on thiſtles, and inhabits Europe. Donov. Inſ. &c.

Splendidula. Grey, with a coppery gold line, and ſtreak in the middle of the wing-caſes near the apex. A new Britiſh ſpecies allied to caſſida nobilis. Marſh. Ent. Brit.

ATRATA. Deep black; anterior part of the ſhield ſanguineous. Inhabits Germany. Fabr.

AFFINIS. Wing-caſes grey, dotted with black; thorax yellowiſh, and without ſpots. Inhabits Europe. Olivier.

AUSTRIACA. Thorax and wing-caſes duſky, dotted with black; margin rufous and immaculate. A native of Auſtria.

CRIBRARIA. Reddiſh; thorax with four black dots; thoſe on the wing-caſes numerous; ſhield emarginate. Inhabits America. Olivier.

DEUSTA. Reddiſh; numerous blue black dots on the wing-caſes, and two on the thorax; ſhield entire. A native of New Holland. Olivier.

OCTO-PUNCTATA. Reddiſh; thorax with two blue black dots; wing-caſes with four on each. Inhabits Siam. Fabr.

INTERRUPTA. Yellowiſh; thorax immaculate; wing-caſes with a broad black interrupted line. Inhabits New Holland. Fabr.

ST. CRUCIS. Teſtaceous; wing-caſes golden with three tubercles at the baſe; margin pale, with two black bands beneath.

SEX-PUNCTATA. Yellowiſh; diſk of the wing-caſes ferruginous, with ſix black dots. Inhabits Cayenne. Fabr.

ANNULUS. Yellowiſh; diſk of the wing caſes black, with two yellowiſh rings, and poſterior band. Inhabits Cayenne. Fabr.

JUDAICA. Ferruginous; diſk of the wing-caſes marked with impreſſed dots, and ſpots of black. Found in South America. Fabr.

HEBRAEA. Pale, with numerous ſmall black lines. Inhabits Cayenne.

CINCTA. Thorax and wing-caſes duſky, with yellowiſh margin; wing-caſes with a white hyaline ſpot before the edge. Inhabits Africa.

MARGINELLA. Green; margin of the thorax and wing-caſes yellow. A native of Brazil.

LIMBATA. Head, thorax, and wing-caſes duſky, with reddiſh margins. Found in Germany. Olivier.

FERRUGINEA. Black; thorax and wing-caſes ferruginous and immaculate. Fabr. Caſſida ſubferruginea of Schranck. Smaller than caſſida viridis, and inhabits Germany. Rarely found in England.

VIBEX. Greeniſh; dorſal ſuture ſanguineous. A native of Germany. Olivier.

AFFINIS. Wing-caſes greyiſh, with black dots; thorax yellowiſh, and without ſpots. An European ſpecies deſcribed by Fabricius.

TRUNCATA. Rufous; wing-caſes ſlightly reticulated, and ſpotted with black; back gibbous. Fabr. This is of a large ſize; native place unknown.

GIBBOSA. Black, with two villous golden ſpots; wing-caſes reticulated with greeniſh; an obtuſe ſpine on the ſuture. A large ſpecies, deſcribed by Fabricius as a Braſilian inſect.

BIDENS. Black; anterior part of the wing-caſes projecting, and an erect ſpine at the ſuture. Inhabits the ſame country as the preceding, and is of a large ſize.

SPINIFEX. Ferruginous; wing-caſes with a projecting ſpine at the anterior angle; thorax with a tranſverſe ſpine on each ſide. Inhabits India. Voet.

BICORNIS. Cyaneous; a truncated ſpine at the anterior angle of the wing-caſes. Inhabits South America.

PERFORATA. Teſtaceous; wing-caſes ſpinous at the anterior angle, and perforated at the baſe. Pallas.

JAMAICENSIS. Pale yellow, braſſy; wing-caſes immaculate with hollow dots. This kind inhabits Jamaica. Olivier.

MARGARITACEA. Greeniſh; wing-caſes poliſhed ſilvery green; head and breaſt black. Inhabits Saxony. Schaller.

FASTUOSA. Black; wing-caſes braſſy red, with black ſpots. Inhabits the ſame country as the preceding. Schaller.

FUSCA. Tawny, with two raiſed lines on the wing-caſes. Laichart.

CRUCIATA. Pale; diſk black, with four yellowiſh ſpots. Fabr. Spec. Inſ. Found on plants in Europe.

CRUX. Yellow; thorax with a ferruginous dorſal line; diſk of the wing-caſes ferruginous, with four yellow ſpots. Fabr. Inhabits Cayenne, and is ſtrongly allied to C. cruciata.

UNDECIM-PUNCTATA. Yellowiſh, ſingle dot in the middle of the thorax, and eleven on the wing-caſes black. A native of Cayenne. Fabr.

BIFASCIATA. Pale; body with two fuſcous bands. Inhabits South America. Gmelin.

FLAVA. Yellow, and without ſpots; body teſtaceous, with a black ſpot on the ſcutel. Fabr. Found in the ſouth of Europe.

PURPUREA. Yellow; body above purple. This is a ſmall ſpecies, and inhabits America.

LEUCOPHÆA. Teſtaceous; margin dotted with yellow. Found in America. Linn.

TUBERCULATA. Teſtaceous; margins yellow; three tubercles on the wing-caſes. Inhabits Sierra Leon.

BITUBERCULATA. Brown, with white margin; wing-caſes ſpotted with black; and a ſingle tubercle at the baſe. A native of Cayenne. This is greatly allied to *tuberculata*, but is only half the ſize.

SUTURALIS. Brown; wing-caſes yellow, with brown ſuture. An African ſpecies. Fabr.

BIGUTTATA. Thorax yellow; wing-caſes reddiſh; margin black, with two yellow ſpots.

MILIARIS. Yellow; thorax immaculate; wing-caſes dotted with black, and two marginal bands. Inhabits the iſland of St. Helena.

PUNCTATA. Black; ſhield brown; wing-caſes yellow, with black ſpots.

RETICULARIS. Yellow; wing-caſes variegated with azure, and a ſingle lateral band. Fabr. A ſpecies of large ſize found in South America.

VARIEGATA. Rufous; wing-caſes variegated with azure, and a ſingle lateral band. Inhabits America.

TRIFASCIATA. Rufous; wing-caſes with three lateral bands. Fabr. This kind inhabits India.

ANNULATA. Azure; two ſpots on the thorax, and ſix rings on the wing-caſes, rufous. Fabr. Is of a large ſize; inhabits South America and India. A variety of this inſect is deſcribed by Herbſt under the name of caſſida ornata.

GROSSA. Sanguineous; diſk of the wing-caſes ſprinkled with black dots, and ramoſe black lines on the margin. Inhabits South America.

CLATHRATA. Ferruginous; margin of the wing-caſes, longitudinal line, and one half tranſverſely black. Deſcribed by De Geer. This ſpecies is a native of India. The thorax is immaculate; wing-caſes very broad. The female is diſtinguiſhed by having three diſtinct lines acroſs.

SEPTEM-GUTTATA. Black, with ſeven white ſpots on the wing-caſes. Gmel. This is rather an ambiguous ſpecies.

EXCLAMATIONIS. Yellow, with three black lines, the middle one interrupted, and reſembling the note of exclamation, (!). This inhabits South America. Fabr.

LINEATA. Greyiſh, with four whitiſh lines on the wing-caſes. Fabr. Inhabits the Cape of Good Hope.

JAMAICENSIS. Pale braſſy yellow; wing-caſes immaculate, with hollow or excavated punctures. Fabr. Deſcribed by Sloane in his Natural Hiſtory of Jamaica.

DORSATA. Thorax and wing-caſes duſky, the laſt with a ſpine at the ſuture, and whitiſh at the margin; baſe duſky. Fabr. Inhabits Siam.

QUADRIPUSTULATA. Thorax duſky; wing-caſes ſanguineous; margin blue, with two red ſpots. Inhabits America.

CYANEA. Braſſy blue; wing-caſes immaculate, with excavated dots. A Linnæan ſpecies deſcribed by Petiver and Degeer. Inhabits America.

MARGINATA. Wing-caſes teſtaceous; body and wing-caſes edged with black; thorax braſſy. A native of South America.

INÆQUALIS. Braſſy ferruginous; wing-caſes with a ſubovate yellow ſpot in the diſk. Inhabits the ſame country as the preceding.

SUPPOSITA. Wing-caſes black, annulated anteriorly, with a fulvous dot in the middle. A ſmall American ſpecies. Lederm.

LATERALIS. Braſſy fuſcous, with a yellow lateral ſpot on the wing-caſes. De Geer, Subzer, &c. Inhabits South America.

DISCOIDES. Braſſy green, with two approximate yellow ſpots on the diſk of the wing-caſes. Fabr. Caſſida quadrimaculata. Degeer. Inhabits South America.

DECUSSATA. Bluiſh black; wing-caſes ſpotted with yellow; the dorſal ſpots reticulated, thoſe on the ſides diſtinct. Inhabits Jamaica. Fabr.

BIPUNCTATA. Yellowiſh, with two black dots on the wing caſes. Fabr. Inhabits India.

BIPUSTULATA. Green, with two lateral ſanguineous ſpots on the wing-caſes. Linn. Amœn. Acad. A native of Cayenne.

SEX-PUSTULATA. Azure, with three red ſpots on the wing-caſes. Inhabits Brazil. Fabr.

SEXDECIM-PUSTULATA. Black; two dots on the thorax, and ſeven on the wing-caſes red. Fabr. A native of South America.

ANGUSTATA. Yellowiſh; wing-caſes narrowed behind. Gmel. Inhabits India.

BITUBERCULATA. Brown, with a white margin; wing-caſes ſpotted with black, and a ſingle tubercle at the baſe of each. Fabr. Inhabits Cayenne. This ſpecies is allied to caſſida tuberculata, but is only half the ſize.

TAURUS. Black; wing-caſes with a truncated ſpine at the anterior angle. Inhabits Cayenne. Fabr. Reſembles C. bicornis, except in being rather ſmaller.

RETIFORMIS. Black; thorax with two yellowiſh ſpots; wings yellow, reticulated with black. A native of Cayenne. Fabr.

PALLIATA. Black; thorax villous greeniſh; wing-caſes greeniſh, with the margin and middle line ferruginous. Fabr. Inhabits Cayenne.

RUBIGINOSA. Ferruginous; thorax and wing-caſes fuſcous, dotted; outer margin ciliated. Linn. This ſpecies is found in Europe.

CUPREA. Above coppery; edge of the thorax, and two marginal ſpots on the wing-caſes rufous. A native of Cayenne.

NITENS. Black; thorax and wing-caſes grey, gloſſed with gold; legs livid. Linn. Native country unknown.

SUPERBA. Black; wing-caſes dotted, and with the ſhield golden green; antennæ, abdomen, and legs greeniſh. A Linnæan ſpecies. This is found in Europe; the golden hue mentioned by Linnæus vaniſhes at the time the inſect dies.

SANGUINOLENTA. Golden yellow; oval ring on the wing-caſes, and tubercle on the ſuture ſanguineous. Inhabits America.

ARCUATA. Whitiſh, with a common black diſk; the border, oval ring, and poſterior arched line fine yellow. Swederus. A native of Rio Janeiro. This is of the middle ſize, and has the breaſt and abdomen black.

CASSIDA, in *Ancient Geography*, a town of India, on this ſide of the Ganges. Ptolemy.

CASSIDARIUS, in the *Ancient Armories*, he who had the care and cuſtody of the *caſſides*, or helmets. Spon gives an ancient inſcription found at Rome, on a tomb erected to a caſſidarius of the emperor Domitian.

CASSIDONY, a name given by the Italians and Germans to a ſort of beads made of the yellow and red chalcedony, a very beautiful ſtone, or of an agate ſomething reſembling it in colour. They alſo call the ſtones themſelves by this name; but are by no means determinate in the meaning of the word, not reſtraining it to any one peculiar ſpecies.

CASSIDONY, in *Botany*. Raï. Hiſt. Plant. See LAVANDULA STÆCHAS.

CASSII, in *Ancient Geography*. See CATTIVELLAUNI.

CASSILIACUM, a town of Rhœtia Prima, now called Roma-Keſſel.

CASSIMBUZAR, in *Geography*. See CASSUMBAZAR.

CASSIMER, or CASIMER, in *Commerce*, a thin twilled woollen cloth, much in uſe for ſummer wear.

CASSIMIRE, or CASHMIRE, in *Geography*. See CASHMERE.

CASSINE, in *Botany*, (a name given by the Indians of Florida to a plant once placed under this genus, but now referred to Ilex) Linn. Gen. 371. Schreb. 504. Willd. 568. Lam. Ill. 360. Juſſ. p. 378. Vent. vol. iii. p. 467. Gært. 575. Claſs and Ord. *Pentandria trigynia*, Linn. (*monogynia*. Lam.) Nat. Ord. *Dumoſæ*, Linn. *Rhamni*, Juſſ. *Rhamnoideæ*, Vent.

Gen. Ch. *Cal.* perianth ſmall, five-cleft, permanent. *Cor.* deeply five-cleft, ſo as to be almoſt pentapetalous; ſegments ſomewhat egg-ſhaped, ſpreading, larger than the calyx. *Stam.* Filaments five, awl-ſhaped, alternate with the ſegments of the corolla; anthers roundiſh. *Piſt.* germ ſuperior, conical; ſtyle none, ſtigmas three. *Peric.* Berry dry, drupaceous, roundiſh, three-celled, umbilicated with the ſtigmas. *Seeds* ſolitary, ſomewhat egg-ſhaped.

Eſſ. Ch. *Calyx* five-cleft. *Corolla* deeply five-cleft; ſegments alternate with the ſtamens. Stigmas three. Berry dry, three-celled, three-ſeeded.

Sp. 1. C. *Capenſis*, Linn. Mant. 220. Willd. 1. Lam. 1. Mart. 1. Lam. Illuſ. Tab. 130. fig. 3. (Celaſtrus, Burm. Afr. Tab. 85. Phillyrea, Dill. Elth. 315. tab. 236. fig. 305.) "Leaves oppoſite, egg-ſhaped, obtuſe, ſerrated; little branches tetragonous." *β*. with looſer corymbs. Burm. Afr. Tab. 86. C. colpoon, Thunb. Willd. Evonymus Colpoon, Linn. Mant.? A ſhrub five or ſix feet high, with a brown or purpliſh bark. *Leaves* petioled, flat, veined, ſtiff, ſmooth. *Flowers* white, in axillary branched corymbs. A native of the Cape of Good Hope. 2. C. *maurocenia*, Linn. Sp. Pl. 2. Mart. 4. Lam. Enc. 7. Illuſ. 2. Tab. 130. fig. 1. Gært. tab. 92, fig. 4. (Frangula ſempervirens. Dill. Elth. 146. tab. 121. fig. 147.) "Leaves oppoſite, inverſely egg-ſhaped, coriaceous, quite entire; little branches round." A ſhrub, five or ſix feet high, as cultivated in Europe, but more lofty in its native climate, with a dark-coloured bark; branches ſtiff; young ſhoots deep purple, or dull red. *Leaves* generally oppoſite, ſmooth, convex above, particularly the upper ones, with the edges a little reflexed underneath. *Flowers* ſmall, whitiſh, in ſhort axillary bunches or corymbs, three or four together, on a ſlender common peduncle; ſtamens inſerted into a fleſhy diſk which ſurrounds the germ, and covers the baſe of the corolla. A native of South Africa. 3. *Magellanica*, Lam. Illuſ. 3. "Leaves alternate, ovate-lanceolate, acute, obtuſely ſerrated; flowers axillary, nearly ſeſſile." A native of Magellan found by Commerſon.

*Propagation and Culture.* The firſt two ſpecies have long found a place in European collections on account of the beauty of their leaves, which continue on the tree all the year. They require no artificial heat, but muſt be removed into a well ſheltered green-houſe in the winter. The beſt method of increaſing them is by laying down the ſhoots that are neareſt the ground, which ſhould be twiſted to facilitate their throwing out roots. Thoſe which are laid down in autumn will be fit to remove in the autumn ſucceeding. They may be propagated alſo by cuttings; but in this caſe they will ſeldom be rooted enough to tranſplant in leſs than two years. The firſt kind is the leaſt hardy, requires greater care in winter, and ſeldom ripens its ſeeds in England. The other produces plenty of fruit, and enlivens the greenhouſe throughout the winter.

Cassine *peragua*; Linn. Mant. and Mat. Med.—Caroliniana; Lam. Enc. See Ilex *Vomitoria*. There is much confuſion in authors concerning this plant. In the Species Plantarum, Linnæus, as appears from his ſynonyms, confounded C. capenſis of recent botaniſts with the plant in queſtion. Martyn aſſerts that the C. peragua of Miller, quoted by Linnæus in Mantiſſa, 2. and Mat. Med. as a ſynonym of his peragua, is ilex vomitoria, but that the peragua of thoſe works is viburnum lævigatum; and in this opinion he is ſupported by Willdenow. La Marck, in Encyc. ſuppoſes, but with a mark of doubt, that his caroliniana is the peragua of Linnæus; and in his Illuſtrations that his ilex floridanus is the ilex vomitorius of the Hortus Kewenſis, without any reference to caſſine peragua of Linnæus. In Martyn's Miller the leaves of ilex vomitoria are ſaid to be leſs bitter than thoſe of the caſſine, caſſioberry buſh, or viburnum lævigatum, but under the article Viburnum lævigatum, no mention is made of any medical qualities poſſeſſed by that plant. It appears from Boſc that the North Americans uſe an infuſion of the leaves both of ilex vomitoria and of viburnum lævigatum as a medicinal beverage.

Cassine *oleoides, concava & lævigata*, Lam. Encyc. See Celastrus *oleoides, concavus & lævigatus*.

Cassine, from the Italian word *Caſſina*, in the *Military Language*, a houſe ſurrounded with a ditch like thoſe of the nobleſſe in Flanders, or thoſe of the feudal lords or barons, favourable for the reception of a ſmall body of men, who are placed by it out of the reach of an attack or ſurpriſe, and can defend themſelves in it till detachments come to their relief.

CASSINI, John Dominic, in *Biography*, an eminent aſtronomer, was born of a noble family in Piedmont, in 1625. His diſtinguiſhed talents for literature were manifeſted at an early age, and after being aſſiduouſly encouraged and cultivated by domeſtic tutors, they were further exerciſed and improved at the college of Jeſuits in Genoa. Some of his poetical compoſitions in the Latin language were thought worthy of publication, when he had attained the age of 11 years. But being caſually led to the ſtudy of aſtronomy, his progreſs in this ſcience which ſuited the bent of his genius, and in which he afterwards ſo eminently excelled, was ſo rapid and ſo great that in 1650 he was invited by the ſenate of Bologna to accept the chair of mathematical profeſſor. When he firſt went to that city he was no more than 15 years of age; and here employed himſelf in teaching the mathematics and in various celeſtial obſervations. The comet which appeared in 1652, was obſerved by him with great accuracy; and afforded him an opportunity of aſcertaining that comets were not temporary phenomena in the atmoſphere, as had been generally ſuppoſed, but bodies of the ſame nature, and probably governed by the ſame laws as the planets. In the ſame year he alſo reſolved the aſtronomical problem, which Kepler and Bullialdus had deemed incapable of ſolution, for geometrically determining the apogee and eccentricity of a planet from its mean and true place. In the following year, 1653, when the church of Bologna was repaired and enlarged, he obtained leave from the ſenate to correct and ſettle a meridian line. See Bologna and Meridian. In 1657 he aſſiſted a nobleman at Rome in compoſing ſome differences that had taken place between Bologna and Ferrara, in conſequence of the inundations of the Po; and his conduct on this occaſion, as well as the talents he had manifeſted in other tranſactions, induced Marius Chigi, the pope's brother, to appoint him in 1663 inſpector general of the fortifications of the caſtle of Urbino; and he was afterwards entruſted for ſeveral years with the care of all the rivers in the eccleſiaſtical ſtate. But he was not diverted by any occupations of this kind from proſecuting his aſtronomical ſtudies and obſervations. He diſcovered many particulars relating to the planets Mars and Venus, and more eſpecially the revolution of the former round its axis; and he directed peculiar attention to the theory of Jupiter's ſatellites, which after much labour, and many obſervations, he ſettled with accuracy, and publiſhed at Rome, among other aſtronomical pieces, in 1666. When Picard, the famous French aſtronomer, had an opportunity of examining theſe tables, he found them ſo accurate that he conceived a high opinion of the ſkill and judgment of the author, and they contributed ſo much to extend his reputation that he was invited to become a member of the Academy of Sciences, eſtabliſhed about this time by Lewis XIV. As he could not leave his ſtation without the permiſſion of his ſuperiors, the French monarch applied to the pope and ſenate of Bologna for this purpoſe; and they granted him leave of abſence for 6 years, ſo that he came to Paris in 1669, and was immediately appointed royal aſtronomer. At the expiration of the ſtipulated term, the pope and ſenate of Bologna inſiſted on his return, under penalty of forfeiting his revenues and emoluments, which had been hitherto continued without interruption; but he was nevertheleſs prevailed upon by the miniſter to remain in France, where he was naturalized in 1673, and about the ſame time entered into the marriage ſtate.

The royal obſervatory having been completed in 1670, Caſſini took poſſeſſion of it in the following year, and aſſiduouſly proſecuted the duties of his profeſſion. In 1672, he determined the parallax of Mars and the ſun, by comparing ſome obſervations which he made at Paris with others that were made at the ſame time in America; in 1677, he demonſtrated that the diurnal rotation of Jupiter about its axis was performed in 9 hours 58 minutes, by means of the motion of a ſpot in one of his larger belts; and in 1684, he diſcovered four ſatellites of Saturn, in addition to that which Huygens had before obſerved. A new edition of his "Tables of Jupiter's Satellites," corrected by later obſervations, was publiſhed in 1693; and in 1695 he viſited Bologna for the purpoſe of examining the meridian line which he had fixed there in 1653, and there he ſhewed, in the preſence of ſeveral eminent mathematicians, that it had not for forty years undergone the leaſt variation. In 1700 he continued the meridian line, begun by Picard, to the moſt ſouthern limits of France. Caſſini was a reſident at the Royal obſervatory of Paris more than 40 years; and in that long period he did the greateſt honour to the eſtabliſhment by various obſervations and diſcoveries, which it would far exceed our bounds to recite in this article, but which will be duly noticed in their proper places. The titles of his publications occupy nearly five pages in the cloſely printed index of Rozier. He had the misfortune to be deprived of his ſight during the latter years of his life; and he died on the 14th of September, 1712, at the age of 87 years. Mem. of the Paris Acad. for 1712.

Cassini, James, the younger ſon of the former, was born at Paris in 1677; and having ſtudied mathematics and philoſophy, firſt at his father's houſe, and afterwards at the Mazarine college under Varignon, who was mathematical profeſſor, his proficiency was ſuch that at the age of 15 years he acquired great reputation in ſupporting a mathematical theſis. When he was 17 years old, he was admitted a member of the Academy of Sciences, and at this time accompanied his father to Bologna, and aſſiſted him in verifying the meridian, and other operations. On his return he took a journey to Holland, where he diſcovered ſome errors in the meaſurement of the earth by Snellius, the reſult of which was communicated to the Academy of Sciences in 1702. In 1696 he viſited England, and became a member of the Royal Society. In 1712 he ſucceeded his father as aſtronomer royal at the obſervatory. In 1717 he communicated to the academy his reſearches on the diſtance of the fixed ſtars, in which he ſhewed that the whole annual orbit is a mere point in compariſon with this diſtance; and in the ſame year he preſented his diſcoveries concerning the inclination of the orbits of the planets in general, and eſpecially of thoſe of Saturn's ſatellites and ring. In 1725, he undertook to inveſtigate the cauſe of the moon's libration. See Libration. His attention was directed in 1732 to an important queſtion relating to the planet Venus. The diurnal rotation of this planet had been determined by his father to be performed in 23 hours, and in a work publiſhed by Bianchini in 1729, it was ſettled at 24 days eight hours. Caſſini upon examining Bianchini's obſervations of the ſpots of Venus, found that he had intermitted his obſervations for three hours, and thus had probably been led to miſtake new ſpots for old ones, ſo as to deduce from the whole an erroneous concluſion. Soon afterwards Caſſini aſcertained the nature and quantity of the acceleration of Jupiter's motion, at half a ſecond in the year, and of the retardation of Saturn's at two minutes annually; and that theſe quantities would go on increaſing for 2000 years, and then would decreaſe again. In 1740 he publiſhed his "Aſtronomical Tables," and his "Elements of Aſtronomy;" both of which are very comprehenſive and accurate works. Caſſini, though he particularly excelled in the department of aſtronomy, extended his reſearches to other branches of ſcience. Accordingly he publiſhed ſome experiments on electricity, or the light produced by friction; the recoil of fire-arms; the aſcent of the mercury in the barometer at different heights above the level of the ſea; the improvement of burning glaſſes, &c. In 1700, he aſſiſted his father in the meaſurement of the meridian; and in 1718 he finiſhed the operation begun by M. de le Hire north of Paris, in concurrence with Maraldi and the younger de la Hire. Hence he was led to conclude, that the degrees of the meridian were not only of different lengths in different parts, but that they decreaſed more and more towards the pole; and that conſequently the figure of the earth was that of an oblong ſpheroid, having its axis longer than the equatorial diameter. He alſo meaſured the perpendicular to the ſame meridian, and compared the meaſured diſtance with the differences of longitude as before determined by the eclipſes of Jupiter's ſatellites; and he alſo inferred from this meaſurement, that the length of the degrees of longitude was ſmaller than it would be in a ſphere, and that therefore the figure of the earth was an oblong ſpheroid. Theſe concluſions induced the French government to appoint two claſſes of mathematicians, one for meaſuring a degree at the equator, and the other at the polar circle; and the reſult of the whole was a determination that Caſſini's concluſions were erroneous, and that the figure of the earth was an oblate ſpheroid, conformably to Newton's inference from the theory of gravity. Caſſini prolonged a life of meritorious labour to an advanced period, and at length loſt his life by a fall in April 1756, in the 80th year of his age. His publications were "A Treatiſe on the Magnitude and Figure of the Earth;" "The Elements or Theory of the Planets, with Tables;" and a great number of papers in the Memoirs of the Academy of Sciences from the year 1669 to 1755.

Cassini, De Thury, Cæsar-François, the ſecond ſon of the former, inherited his talents and ſupported the reputation of the family in ſcientific reſearches and diſcoveries. He ſucceeded his father as director of the obſervatory, and he had the honour of being a member of moſt of the learned ſocieties in Europe. He was born at Paris, June 17th, 1714, and received his firſt inſtructions in mathematics and aſtronomy from M. M. Maraldi and Camus; and his proficiency was ſuch, that he was ſcarcely 10 years of age when he calculated the phaſes of the total eclipſe of the ſun of 1727. At the age of 18 he aſſiſted his father in drawing the perpendicular to the obſervatory-meridian from Straſburg to Breſt; and the buſineſs of traverſing the country by ſeveral lines parallel and perpendicular to the meridian of Paris, with a view to the formation of a general chart of France, was entruſted to Caſſini. He alſo undertook to meaſure the meridian of Paris by a new ſeries of triangles, of a ſmaller number, and more advantageouſly diſpoſed than thoſe employed by his grandfather and father, for the purpoſe of obtaining a more accurate reſult. This great work was publiſhed in 1740, with a chart, ſhewing the new meridian of Paris, by two different ſeries of triangles, paſſing along the ſea-coaſts, to Bayonne, traverſing the frontiers of Spain to the Mediterranean and Antibes, and thence along the eaſtern limits of France to Dunkirk, with parallel and perpendicular lines deſcribed at the diſtance of 6000 toiſes from one another, from one ſide of the country to the other. In 1735, he was admitted into the academy as adjunct ſupernumerary. A particular chart of France, conſtructed at the ſpecial ſuggeſtion of the king, took its riſe from a tour made by Caſſini in Flanders, in company with his majeſty, about the year 1741. He alſo publiſhed various works relative to theſe charts, and a great number of the charts themſelves. In 1761, he undertook an expedition into Germany; for the purpoſe of continuing to Vienna the perpendicular of the Paris meridian; of uniting the triangles of the chart of France with the points taken in Germany; of preparing the means of extending into this country a plan ſimilar to that of France; and of thus eſtabliſhing ſucceſſively for the whole of Europe a very uſeful uniformity. His obſervations of the tranſit of Venus, on the 6th of June, 1761, made during his ſtay at Vienna, were publiſhed in his "Voyage en Allemagne." Availing himſelf of the peace which afterwards took place between England and France, with a view to the accompliſhment of his great object, he propoſed the joining of certain points taken upon the Engliſh coaſt with thoſe which had been determined on that of France, and thus connecting the general chart of the latter with that of the Britiſh iſles, in a manner ſimilar to that by which he had united it with thoſe of Flanders and Germany. This propoſal was favourably received by the Engliſh government, and carried into effect, under the direction of the Royal Society, by which the excution was committed to the late general Roy. After his death it was for ſome time ſuſpended; but the farther execution of it was committed, under the auſpices of the duke of Richmond, then maſter-general of the ordnance, to the care of col. Edward Williams and captain William Mudge, reſpectable officers of the artillery, aud Mr. Iſaac Dalby, who had before aſſiſted general Roy.

The volumes of the Memoirs of the French Academy, between the years 1735 and 1770, contain a prodigious number of papers communicated by M. Caſſini, and conſiſting of aſtronomical obſervations and queſtions; among which are "Reſearches concerning the Parallax of the Sun, the Moon, Mars, and Venus; "On Aſtronomical Refractions, and the Effect cauſed in their Quantity and Laws by the Weather;" and "Numerous Obſervations on the Obliquity of the Ecliptic, and on the Law of its Variations." In ſhort, Caſſini cultivated aſtronomy for 50 years, a period the moſt important, in relation to that ſcience, that ever elapſed, with regard to the magnitude and variety of objects in which he commonly ſuſtained a principal part. His conſtitution was ſtrong and vigorous, and enabled him to ſurmount the fatigue that attended thoſe laborious operations in aſtronomy and geography, which he had the merit of conducting. However, the laſt twelve years of his life were rendered painful and diſtreſſing by an habitual retention of urine; and it was at length terminated by the ſmall-pox on the 4th of September, 1784, in the 71ſt year of his age; being ſucceeded in the academy, and as director of the obſervatory by his only ſon, count John-Dominic Caſſini, the 4th in order by direct deſcent in that honourable ſtation. Hutton's Math. Dict.

CASSINIAN CURVE, or CASSINOID, in *Aſtronomy*, a curve of an elliptic form, propoſed by M. John-Dominic Caſſini, to be the orbit of a planet. The property of this curve is, that the product of two lines drawn from its foci to any point in the curve, ſhall be equal to a given quantity, viz. to the rectangle under the aphelion and perihelion diſtances of the planet; whereas, in the common ellipſis, the ſum of two lines from the foci to any point in the curve is equal to the ſum of the above diſtances, or tranſverſe diameter. M. Caſſini ſuppoſed that a planet would deſcribe this curve about the ſun, in one of its foci, in ſuch a manner that the angles at the other focus are proportional to the times, which he calls the *focus*, or *centre of mean motion*; and that in which the ſun is placed, he calls the centre of true motion. Whence, any two diſtances of a planet from the focus of the true motion are reciprocally as its diſtances from the focus of mean motion. In this figure, if the leſs axis exceeds the diſtance of the foci, the curve is every where concave towards the centre: if, while the principal axis remains the ſame, the diſtance of the foci is leſſened, the minor axis will be increaſed; and, when the foci meet in the centre, the figure will become a circle; but if, on the contrary, the diſtance of the foci be increaſed, the leſs axis will be leſſened, and will become equal to the ſaid diſtance, ſince the diſtance is to the principal axis as unity to a mean proportional between one and three. If the diſtance of the foci be farther increaſed, the minor axis will be leſſened, the curve will at length have a point of contrary flexure, and will, at the ends of the minor axis, be convex towards the centre; and when the diſtance of the foci is ſo far increaſed, as to be in the ſame proportion to the greater axis as the ſide of a ſquare to the diagonal, that is, as 1 to $\sqrt{2}$, the leſs axis will become nothing, and the curve extend to the centre on each ſide. If the diſtance of the foci be greater in proportion to the tranſverſe diameter, than in the above ratio, the leſs axis is impoſſible, and the figure turns into two conjugate ones, at a diſtance from each other; which, upon the increaſe of the diſtance of the foci, will be leſſened, till at length the figure runs into two conjugate points. The diſtance of the foci increaſing, the two conjugate figures do again emerge, and they increaſe after the ſame manner as they decreaſed before, differing from the former in the order of the foci, and of the vertices, and are increaſed till they become infinite. Afterwards, this ſyſtem will again approach to a circle by the ſame degrees as it receded from it. After tracing a few of the properties of this curve, it muſt be evident that it cannot poſſibly be the orbit of a planet; for it is certain, that in all thoſe caſes, where it paſſes into two conjugate figures, it deviates from what is eſſential to the nature of an orbit, namely, *continuity*; and in all thoſe caſes where it is, at the end of the minor axis, convex towards the centre, the planet would need a centrifugal force to deſcribe ſuch parts of its orbit; that is, it would require at equal diſtances from the ſun, ſometimes a *centrifugal*, and ſometimes a *centripetal* force to retain it in its orbit, which is totally incompatible with all the laws of nature. It may be fairly concluded, that when all the ſpecies of a figure beyond a certain limit are unfit for diſcharging any office of nature, the remaining ſpecies on the other ſide of the limit ſhould be rejected alſo: and when, in addition to this, it is conſidered that the celeſtial obſervations are not conſiſtent with this curve, it can by no means be admitted into aſtronomy.

CASSINOMAGUS, in *Ancient Geography*, *Chaſſenon*, a place of Gaul in Aquitania Prima, 30 French leagues from Sermanicomagus, and 17 from Auguſtorium or Limoges.

CASSIOBERRY-BUSH, in *Botany*. See VIBURNUM *lævigatum*, and ILEX *vomitoria?*

CASSIODORUS, MAGNUS AURELIUS, in *Biography*, a Roman ſenator, born at Brutium, on the confines of Calabria, who flouriſhed in the time of Theodoric the Goth, in the 6th century, who died in 562, at the great age of 93, and who has been enumerated among the few Roman writers on *muſic*; but to whom neither the art nor the ſcience has great obligations. Caſſiodorus, contemporary with Boethius, has given us even leſs information on the ſubject than the excellent author of the diſcourſe "De Conſolatione Philoſophiæ:" for, writing on the ſeven liberal arts (de ſeptem diſciplinis), all that he ſays concerning muſic is contained in one chapter only, conſiſting of but four 4to. pages, and theſe few pages, which hardly contain the ſkeleton of a treatiſe, give us nothing but repetitions of what his predeceſſors have ſaid more fully. And it may, indeed, be aſſerted, without exaggeration, that all the Gr. and Lat. tracts that are come down to us, are but bullets of the ſame calibre, which teach us no part of muſic but the alphabet, nor can any thing be acquired by the moſt intenſe ſtudy of them, except deſpair and the head-ache.

CASSIOPÆA, or CASSIOPE, in *Ancient Geography*, a port of the ſea of Epirus, in the ſouthern part of Chaonia, S.W. of the port of Panormus. Pliny, Strabo, and Ptolemy, mention this city; but M. D'Anville has not placed it in his map. Caſſiope, or Caſſope, was famous on account of the temple of Jupiter Caſſius, whence ſome derive its name.

CASSIOPÆI, a people of Greece, mentioned by Strabo, who inhabited Caſſiopæa, or Caſſiope. This author aſſigns to Caſſiopæa a town and port of the ſame name, and three other ſmall towns in the interior of the country. Pliny alſo mentions the Caſſiopæans, and places them in the vicinity of the Dryopes. M. D'Anville fixes their ſituation on the ſea-coaſt in Theſprotia, towards the upper extremity of the ſouthern part of the iſland of Corcyra.

CASSIOPÆUM *Promontorium*, a promontory of the iſland of Corcyra.

CASSIOPE, a town and ſea-port in the northern part of the iſland of Corcyra, according to Ptolemy and Strabo, who place alſo a promontory of the ſame name in this iſland. It is alſo mentioned by Cicero and Pliny.

Cassiope, a town of Greece, in Caſſiopæa, according to Ptolemy. He places this in the mountains, and more eaſterly than the other.

Cassiope, or Cassiopeia, in *Fabulous Hiſtory*, wife of Cepheus, king of Ethiopia, and mother of Andromeda. Boaſting that ſhe was more beautiful than the Nereids, theſe were ſo incenſed that they beſought Neptune to revenge the affront; upon which he ſent into the country of Cepheus a ſea-monſter, who committed dreadful ravages. In order to appeaſe the god, Andromeda was chained to a rock, and expoſed to the monſter; but was reſcued by Perſeus, who married her, and obtained of Jupiter, that Caſſiopeia might be placed, after her death, among the ſtars. This circumſtance is ſaid to have given occaſion to the conſtellation of that name.

CASSIOPEA, in *Entomology*, a name given by Cramer to an African butterfly deſcribed by Fabricius under the title of Papilio Argia. The wings are roundiſh, of a white colour; anterior pair white, black at the apex, and marked on the lower ſurface near the tip, with a large brown ſpot.

CASSIOPEIA, or Cassiopea, in *Aſtronomy*, one of the 48 conſtellations of the northern hemiſphere, ſituate next to Cepheus, not far from the north pole.

In 1572, there appeared a new ſtar in this conſtellation, which at firſt ſurpaſſed in magnitude and brightneſs Jupiter himſelf; but it diminiſhed by degrees, and at laſt diſappeared, at the end of eighteen months. It alarmed all the aſtronomers of that age, many of whom wrote diſſertations on it; among the reſt Tycho Brahe, Kepler, Maurolycus, Lycetus, Gramineus, &c. Beza, the landgrave of Heſſe, Roſa, &c. wrote to prove it a comet, and the ſame which appeared to the Magi, at the birth of Jeſus Chriſt, and that it came to declare his ſecond coming: they were anſwered on this ſubject by Tycho. Several aſtronomers are of opinion that this ſtar has a periodical return, which Keill and others have conjectured to happen every 150 years. Mr. Pigott adopts the ſame opinion; and he accounts for its not being noticed at the completion of every term by its variable luſtre at different periods, ſo that it may ſometimes increaſe only to the 9th magnitude: and if this be the caſe, its period is probably much ſhorter. Phil. Tranſ. vol. lxxvi. p. 193. Dr. Herſchell has given a ſtatement of the comparative luſtre of the ſtars of this conſtellation in the Phil. Tranſ. for 1796, vol. lxxxvi. p. 463.

The ſtars in the conſtellation *Caſſiopeia*, in Ptolemy's Catalogue, are thirteen; in Hevelius's, thirty-ſeven; in Tycho's, forty-ſix; but in the Britannic Catalogue, Mr. Flamſtead makes them fifty-five.

CASSIOTIS, in *Ancient Geography*, a name given by Ptolemy to a country of Egypt, in the vicinity of mount Caſius; bounded, on the eaſt by a part of Judæa and Arabia Petræa.—Alſo, a country of Aſia in Syria, in which Ptolemy has placed 12 towns. This country took its name from mount Caſius in Syria.

CASSIPOUNEA, in *Botany*, Aubl. Juſſ. See Legnotis.

CASSIR, q. d. *Caſtle*, in *Geography*, a town of Africa, in the northern part of the eaſtern province of Algiers, ſituate amongſt the Beni Grobbery, N. of mount Aphroune, and W. of Boujeiah or Bugia. Upon the mountains adjacent to this place the Algerines frequently dig up large pipes of lead, ſuppoſed to have formerly conveyed the excellent water of theſe parts to Saldæ.

Cassir *Aſeite*, a town of Africa, in the kingdom of Tunis, near the gulf of Hamamett; about 30 miles S.E. of Tunis. This lies upon the ruins of a city, called by the ancients "Civitas Siagitana."

Cassir *Attyre*, a place of Africa, in the eaſtern province of Algiers, lying a little to the ſouthward of Seteef, famous for its adjacent plains and paſture grounds, which are cultivated by the Raigah, a clan of Arabs, noted for the breeding of cattle, particularly of horſes, that are reckoned the beſt in this kingdom.

CASSIS, a town of France, in the department of the Rhone, on the coaſt of the Mediterranean, with a ſmall port; 8 miles S.E. of Marſeilles.

Cassis, in *Military Language*, the ſame as Cask; which ſee.

CASSITAH, in *Geography*, an Indian town of America, which, as well as the Coweta town, is 60 miles below the Horſe-ford or Chattahouſee river.

CASSITERIA, in *Natural Hiſtory*, the name of a genus of cryſtals. The word is derived from κασσιτερος, *tin*; and expreſſes cryſtals which are influenced in their figures by an admixture of the particles of that metal. Theſe are all pyramidals without columns, and compoſed only of four ſides or planes. Of this genus there are only two known ſpecies, the whitiſh and the brown; found in Devonſhire and Cornwall.

CASSITERIDES, in *Ancient Geography*, an appellation which formerly comprehended Great Britain and Ireland, and which was afterwards reſtricted to the iſles of Scilly, famous, as well as the neighbouring coaſt of Cornwall, for their tin, which, according to Pliny, (l. xxxiii. c. 16.) was white and the moſt valuable, and called by the Greeks *caſſiteron*. Strabo ſays (Geog. vol. i. p. 265. ed. Caſaub.) that they were 10 in number, ſituated near one another and toward the north from the port of the Artabri. One was a deſert iſland; the reſt were inhabited by a people wearing black garments, which hung down to their heels and were bound round their breaſts. They ſubſiſted on their herds and had no fixed habitations: but they ſupplied thoſe who traded with them with tin, lead, and ſkins, in exchange for which they received earthen veſſels, ſalt, and braſs. The Phœnicians, ſays this geographer, were in ancient times the only perſons who carried on this commerce with them, ſailing hither from Gades, but concealing their navigation from the reſt of the world. The Greeks ſucceeded the Phœnicians, and they were at length followed by the Romans. Caſſiterides, in the Greek language, denotes "the iſlands of tin;" but this name was probably derived from ſome Phœnician or Celtic term. The Chaldeans and Arabians uſed words very ſimilar to ſignify tin. Thus in Numb. xxxi. 22, for the Hebrew בדיל, and Greek κασσίτερος, Jonathan has קסטירא, *kaſtira*, and the Jeruſalem interpreter קיסטרא, *kiſtera*, and the Arabs קזדיר, *kaſdir*: and in the Talmudic tract of the Sanhedrin קסטיטרין, *kaſtiterion*, is tin. From theſe different modes of expreſſion, we may infer that the term was borrowed from other nations by the Greeks.

Bochart, Geog. Sacr. apud. Oper. vol. i. p. 650. Theſe iſlands were alſo denominated "Sorlings," which, in the language of the Britons, ſignifies "ſeparated from the height of the land;" and it has been ſuggeſted, that the term "Caſſiteride" may be compoſed of Briton or Celtic words, viz. "Kaz i ter i" ſignifying "they are almoſt ſeparated." According to this etymology, the name *κασσιτερος* ſucceeded that of "Caſſiteri;" and it has been inferred that the Phœnicians derived their tin from the iſlands denominated Sorlings, as well as from the country of Cornwall.

CASSITHA, in *Botany*, Tabern. See Cuscuta.

CASSIUM, in *Geography*, a town of Africa in the country called Caſſiotis. Ptolemy.

CASSIUS, Caius, in *Biography*, a celebrated Roman, was the deſcendant of an ancient and honourable family, ſo zealous for the public liberty, that one of his anceſtors, Sp. Caſſius, after a triumph and three conſulſhips, is ſaid to have been condemned, and put to death by his own father, for aiming at dominion. C. Caſſius himſelf manifeſted at an early age his hatred of tyranny; for hearing, when he was a boy at ſchool, Fauſtus, the ſon of Sylla, boaſting among his ſchool-fellows of his father's greatneſs and abſolute power, he gave him a box on the ear; and he afterwards declared, in the preſence of Pompey, who demanded an account of the quarrel, that if Fauſtus ſhould dare to repeat the words, he would repeat the blow. In the Parthian war he was quæſtor to Craſſus, and ſignalized himſelf both by his courage and ſkill, and if Craſſus had followed his advice, would have preſerved the whole army. After the defeat and death of this leader, B. C. 53, he made good his retreat with the remains of the broken legions into Syria; and when the Parthians who purſued him blocked him up in Antioch, he preſerved that city and province from falling into their hands; and, watching his opportunity, gained a conſiderable victory over them, with the deſtruction of their general. In the civil war between Cæſar and Pompey, he took part with the latter, and commanded his fleet. After the battle of Pharſalia, B. C. 48, he ſailed with 70 ſhips to the coaſt of Aſia, with a view of raiſing forces, and renewing the war againſt Cæſar; and as ſoon as he had obtained intelligence where Cæſar, who croſſed the Helleſpont with a ſmall force, deſigned to land, he lay in wait for him, in the bay of Cilicia, at the mouth of the river Cydnus, with a reſolution to deſtroy him; but Cæſar landing on the oppoſite ſhore before he was aware, and his project being thus blaſted, he thought it moſt prudent, whilſt all the people of the country were declaring for him, to make his own peace, by joining the conqueror with his fleet. He ſtill, however, retained his ſtrong diſlike of uſurped authority; and when Cæſar had been created perpetual dictator, and ſeemed to aſpire after royal honours which every true Roman deteſted, he formed a conſpiracy againſt his life, and urged his friend and brother-in-law, Brutus, to take a lead in the execution of his purpoſe. His reſolution to deſtroy Cæſar has been aſcribed to motives of private diſguſt and reſentment, and particularly to his being refuſed the conſulſhip and to Cæſar's having conferred on Brutus the more honourable prætorſhip in preference to him. Hence it has been ſaid, that he hated the tyrant rather than the tyranny, and that in the proſecution of the whole deſign he manifeſted a peculiar rancour. But we need not be at a loſs for the true motive of his conduct, if we advert to his temper and principles. He was ſingularly impetuous and violent, impatient of contradiction, and much more of ſubjection, and paſſionately fond of glory, virtue, and liberty. From theſe qualities Cæſar apprehended his danger; and when admoniſhed to beware of Antony and Dolabella, he uſed to ſay, that it was not the gay, the curled, and the jovial, whom he had cauſe to fear; but the thoughtful, the pale, and the lean; meaning Brutus and Caſſius. For the progreſs and termination of this conſpiracy; ſee M. J. Brutus and Cæsar. After Cæſar's aſſaſſination, the conſpirators withdrew from Rome. Caſſius proceeded to Greece and joined Brutus at Athens. Having raiſed a conſiderable body of troops in Leſſer Aſia, he marched into Syria, the government of which had been aſſigned him by Cæſar, and having made himſelf maſter of the country, he paſſed into Phœnice and Judæa, and then laid ſiege to Laodicea, whither Dolabella, who was endeavouring to take poſſeſſion of Syria, had been under a neceſſity of retreating. Caſſius, having taken the town, treated it with great ſeverity; plundering its temples, levying oppreſſive contributions, and putting to the ſword many of the chief inhabitants. Whilſt he was preparing to invade Egypt, Brutus urged him to oppoſe Antony and Octavianus, who were preparing to croſs over into Macedon. He joined Brutus at Smyrna, and at his recommendation, it was determined that Brutus ſhould reduce the Lycians, whilſt he undertook the expedition againſt the Rhodians. After ſome unſucceſsful engagements on their part, the city of Rhodes was inveſted by ſea and land, and compelled to ſurrender. Caſſius treated the vanquiſhed in the true ſpirit of a Roman general. Having placed his tribunal in the forum with a ſpear planted before it, he reſtrained his ſoldiers from all plunder or violence; and ſummoning 50 of the principal citizens before him, cauſed them immediately to be put to death. Having accumulated from the ſpoils of the city the ſum of 8000 talents, and ordering the commander of the garriſon, which he left behind him, to levy from the inhabitants 500 more, he returned to the continent, and proceeded to join Brutus, exacting from all the provinces of Aſia, as he paſſed, a payment of 10 years' taxes. His junction with Brutus at Sardis was followed by occurrences, of which a brief recital has been given under the article Brutus. On the plains of Philippi the combined army of theſe two commanders met that of the triumvirs; and in the engagement that enſued, the ardour of Brutus in purſuing the troops of Octavianus left him expoſed, and at length obliged him to retire with a ſmall band from the field of battle. Titinius in the mean while was diſpatched to gain intelligence; and when Caſſius, perceiving from the eminence on which he ſtood that he was ſurrounded by a body of cavalry, which he apprehended to be that of the enemy, and not a detachment of friends coming to their relief, as in fact it was, imagined that Titinius was taken priſoner, he reproached himſelf for expoſing a dear friend to ſuch an accident, and withdrew to his tent. He was accompanied by Pindarus, one of his freedmen, who had conſtantly attended him ever ſince the battle in which Craſſus was ſlain, for the purpoſe of performing the laſt office for him, if occaſion ſhould require it. The circumſtances of his death have not been aſcertained: ſome ſay that he diſpatched himſelf with the dagger with which he ſtabbed Cæſar; but the fact was, that his head was found ſevered from his body, and that Pindarus no more appeared. This event occurred on the birth-day of Caſſius, B. C. 42.

Caſſius was a prudent and valiant commander, and an ardent lover of his country; and though he was in many reſpects inferior to Brutus, and chargeable with extortion and cruelty, he has been honoured as an aſſerter of the liberties of Rome, when they were juſt expiring, and he has ſhared with Brutus in the diſtinguiſhing appellation of "laſt of the Romans." He was learned himſelf, and a patron of literature; ſeveral of his letters to Cicero are extant; and that great orator beſtows praiſes on him in various parts of his works. If we compare Caſſius with his friend Brutus, the latter was the more amiable friend, and the former the more dangerous enemy. Caſſius has been charged with violence and cruelty in his mode of exacting money and other neceſſaries from the cities of Aſia. But it has been urged in vindication of his conduct, that he was engaged in an inexpiable war, where he muſt either conquer or periſh with the republic itſelf, and in the proſecution of which his legions were not only to be ſupported, but rewarded; the revenues of the empire were exhauſted; contributions were ſcanty; neighbouring ſtates wiſhed to maintain their neutrality. In theſe difficult circumſtances, when money was neceſſary, and it could only be obtained by force, extortion, it is ſaid, became neceſſary; the neceſſity of the end juſtified the means; and when the ſafety of the empire, and the liberty of Rome were at ſtake, it was no time to liſten to ſcruples. This was Caſſius's mode of reaſoning, and the ground on which he acted; whilſt he applied all his thoughts to the ſupport of the cauſe which he had undertaken. Brutus, on the other hand, being of a temper more mild and ſcrupulous, contented himſelf generally with the regular methods of raiſing money; and from his love of philoſophy and the politer ſtudies, having contracted an affection for the cities of Greece, inſtead of levying contributions, uſed to divert himſelf, wherever he paſſed, with ſeeing their games and exerciſes, and preſiding at their philoſophical diſputations, as if travelling rather for curioſity than to provide materials for a bloody war. When he and Caſſius therefore met, the difference of their circumſtances ſhewed the different effects of their conduct. Caſſius, without receiving a penny from Rome, came rich and amply furniſhed with all the ſtores of war. Brutus, who had received large remittances from Italy, came empty and poor, and unable to ſupport himſelf without the help of Caſſius, who was obliged to give him a third part of that treaſure, which he had been collecting with ſo much envy to himſelf for the common ſervice. In his latter years Caſſius deſerted the Stoics, and became a convert to Epicurus, whoſe doctrine he thought more natural and more reaſonable; conſtantly maintaining, that the pleaſure, which their maſter recommended, was to be found only in the habitual practice of juſtice and virtue. Whilſt he profeſſed himſelf therefore an Epicurean, he lived like a Stoic; being moderate in pleaſures, temperate in diet, and through life a water-drinker. In the letters addreſſed to him by Cicero, though he rallies his Epicuriſm, and change of principles, yet he allows him to have always acted with the greateſt honour and integrity; and pleaſantly ſays, "that he ſhould begin to think that ſect to have more nerves, than he imagined, ſince Caſſius had embraced it." Plutarch, Vit. Brutus apud Opera, T. i. p. 984. Middleton's Life of Cicero, vol. ii. Anc. Un. Hiſt. vol. x & xi.

Cassius, Avidius, an eminent military commander in the reign of Marcus Aurelius and an uſurper of the empire, was, according to Dion Caſſius, a native of Syria, and a ſon of Heliodorus, the rhetorician; but the author of his life, Vulcatius Gallicanus, ſeems to make him the ſon of Avidius Severus, who was raiſed from the rank of a centurion to the higheſt dignities of the ſtate, and as a man of merit, much regarded by Aurelius. The ſame writer repreſents him as by his mother's ſide a deſcendant from the ancient Roman Caſſii. Crevier diſputes that genealogy, though, as he ſays, he poſſeſſed all their haughtineſs, inſolence, and antipathy againſt monarchical government; adding to theſe qualities great ſkill in the art of war, and talents that commanded the fear and obedience of the ſoldiers. The firſt account we have of him is that of his commanding an army againſt the Parthians under the emperor Verus, about the year 164, whom he entirely defeated near Europus, a city of Syria. Improving this victory over Vologeſes II. king of the Parthians, he paſſed the Euphrates, took Cteſiphon, and demoliſhed the royal palace. He likewiſe ſubdued Edeſſa, Babylon, and all Media; and though Seleucia on the Tigris opened its gates to him, he ordered the inhabitants, amounting in number to 400,000, to be inhumanly maſſacred, and the city to be utterly deſtroyed. On his return he loſt great numbers of his men by famine and diſeaſe; however, he put an end to the war, and obtained for the indolent Verus, who had never joined him at Antioch, the title of conqueror of the Parthians and Medes. Caſſius, having acquired the reputation of a rigid diſciplinarian, was inveſted by Aurelius with the command of the legions of Syria; nor did he diſappoint the hopes which the emperor had conceived of him. Whilſt he had this command, he marched againſt the Egyptians, who had revolted, and contrived to ſubdue them by policy rather than force, and he afterwards performed great exploits in Armenia and Arabia. In the war againſt the Sarmatian Jazyges, he puniſhed with an ignominious death ſome centurions who had croſſed the Danube without orders, though they had killed 3000 of them and returned to the camp with very conſiderable booty. This ſeverity occaſioned a mutiny in the army; but Caſſius, with invincible intrepidity, appeared unarmed in the midſt of the incenſed multitude, calling out aloud to them, "kill me; and to your neglect of duty, add the murder of your general;" and by this intrepid valour, he quelled their fury and recalled them to their duty. Whilſt he inſpired his ſoldiers with awe, he likewiſe engaged their attachment; and though, among the inconſiſtent accounts that occurred of his character he is generally repreſented as chargeable with atrocious vices, inſomuch that he has been denominated a ſecond Catiline, he ſeems to have poſſeſſed the qualities neceſſary for conſtituting a great commander. When he commanded in the Parthian war, Verus ſuſpected his ambitious deſigns, and communicated his apprehenſions to M. Aurelius, his partner in the empire. But the philoſophical emperor took no notice of the charge that was alleged againſt him; but continued to entruſt him with the command of the army in the Eaſt. In the 15th year of Aurelius's reign, A. D. 175, Caſſius threw off all diſguiſe, and ventured to declare himſelf his rival in the empire. With this view he availed himſelf of an illneſs, under which Aurelius laboured during his war againſt the Marcomanni, to circulate a report of his death, and to cauſe himſelf to be proclaimed emperor in his room. Having aſſumed this title, he ſoon reduced all the countries beyond mount Taurus, and the governor of Egypt declared in his favour; ſeveral foreign princes and nations reſpected his cauſe, and none with greater zeal than the Jews. Whilſt he was ſucceſsfully purſuing theſe meaſures for the eſtabliſhment of his power, he feigned great reſpect for the memory of Aurelius, and placed him among the gods. As ſoon as the news of this revolt reached Rome, the ſenate inſtantly declared Caſſius a traitor, and confiſcated his effects; but the emperor, with ſingular moderation, left Germany and purſued his march as far as Illyricum towards the eaſt; propoſing to reſign the empire to his competitor, if the gods ſhould judge it expedient for the public good, that Caſſius ſhould reign, and not Marcus Aurelius. He had not proceeded far before he received the news, that Caſſius had been killed in conſequence of a conſpiracy among his inferior officers. When the head of Caſſius was brought to the emperor, he expreſſed much ſorrow, turned away his eyes from it, and cauſed it to be honourably interred, complaining, that he had been deprived of an opportunity of ſhewing his mercy. The reign of Caſſius, or rather his dream, as Dion Caſſius calls it, laſted but three months and ſix days. M. Aurelius would neither try, impriſon, nor condemn any ſenator concerned in the conſpiracy; but referred the whole to the ſenate, appointing a day for the criminals to appear before their judges. His wife and children were treated with unexampled clemency by the emperor; but Commodus afterwards indulged his cruel diſpoſition by burning alive all who were in any degree related to him. Crevier's Rom. Emp. Vol. vii. Anc. Un. Hiſt. vol. xiii.

Cassius *Parmenſis*, a Latin poet, was one of the conſpirators againſt Cæſar, and after the event of his aſſaſſination, attached himſelf firſt to Pompey's ſon, and afterwards to Antony, holding commands under each of them. After the battle of Actium he retired to Athens, where he was put to death by Quintilius Varus, who executed the orders of Octavianus, while Caſſius was at his ſtudies. Horace in his epiſtle to Tibullus makes honourable mention of him:

> "Scribere quod Caſſi Parmenſis opuſcula vincat."
>
> Epiſt. iv. lib. i.

But in another place he ſeems to deſcribe him rather as a rapid and copious, than as an excellent poet. See Sat. x. lib. i.

His papers were carried off by Varus, whence it is probable that the tragedy of Thyeſtes, aſcribed to Varus, was written by Caſſius. The verſes on Orpheus, publiſhed by Achilles Tatius, under the name of Caſſius, are thought to be ſpurious. Voſſ. de Poet. Lat. Gen. Dict. Gen. Biog.

Cassius Severus, Titus, a Roman orator in the age of Auguſtus, more odious for his character than admired for his genius. Beſides the pleaſure which he derived from exerciſing the office of an accuſer, often on very trivial grounds, he was ſo much addicted to ſatire and calumny, that his writings occaſioned a law againſt libels to be paſſed by Auguſtus, and drew upon himſelf a ſentence of exile firſt to Crete, and afterwards to Seriphos, where he died in extreme wretchedneſs. Notwithſtanding the bad qualities of Caſſius, he was one of the ableſt pleaders of his time, and is repreſented by Seneca as poſſeſſing every qualification of a good declaimer. Although he particularly excelled in extempore ſpeaking, he never neglected previous preparation, but wrote down the greateſt part of what he intended to ſpeak. Tacitus, if he be the author of the Dialogue on Orators, repreſents Caſſius as the firſt corrupter of ancient eloquence; and Quintilian, though he allows him ingenuity, quickneſs, and force, repreſents him as deficient in gravity and judgment. Gen. Dict.

Cassius's *purple powder*, or *mineral powder*, in *Chemiſtry*, ſo called from the diſcoverer, is obtained by mixing a largely diluted ſolution of gold, with the ſolution of tin in nitro-muriatic acid, carefully prepared. This precipitate is a mixture of imperfect oxyd of gold with perfect oxyd of tin. Its principal uſe is in enamel and porcelain painting. See Gold.

CASSOCK, a kind of ſurtout, or long upper garment, worn over the reſt of the habit; particularly by the clergy, and anciently likewiſe by the laity. The word comes from the French *caſaque*, *a horſeman's coat*: ſome derive them again, by corruption, from a garment of the Coſſacks: others derive the name *caſſock*, as well as the thing, from the ancient *caracalla*, a ſort of upper garment which hung to the heels.

CASSON, in *Geography*. See Kasson.

CASSONADE, in *Commerce*, caſk ſugar, or ſugar put into caſks or cheſts, after the firſt purification, but which has not been refined. It is ſold either in powder or in lumps; the whiteſt, and that of which the lumps are largeſt, is the beſt. Many imagine it to ſweeten more than loaf-ſugar; but it is certain that it yields a great deal more ſcum. See Sugar.

CASSOPO, in *Geography*, a town of the iſland of Corfu, 8 miles N. of Corfu.

CASSOTIS, in *Ancient Geography*, a fountain of Greece, in the Phocide, and in the vicinity of Delphos. Pauſanias.

CASSOVA, in *Geography*. See Caschau.

Cassova, *Plain of*, a tract of country in European Turkey, which ſeparates Raſcia from Bulgaria, noted on account of the victories of the two firſt Amuraths.

CASSOWARY, in *Ornithology*. See Struthio *Caſuarius*.

CASSUMBAZAR, Cassimbazar, or Cossimbazar, in *Geography*. See Cossimbazar.

CASSUMUNAR, in the *Materia Medica*. See Casamunar.

CASSUTHA, in *Botany*, Rumph. See Cassyta.

CASSUVIUM, Rumph. Lam. Juſſ. See Anacardium.

CASSYTA, Linn. gen. 505. Schreb. 690. Willd. 802. Juſſ. p. 439. Gært. 160. (Volutella, Forſk. Collodion, Lour. Cochin.) Claſs and ord. *Enneandria monogynia.* Nat. ord. uncertain. Juſſ.

Gen. Ch. *Cal.* perianth three-leafed, very ſmall, permanent; leaves ſemi-ovate, acute, concave, erect. *Cor.* petals three, roundiſh, acute, concave, permanent; nectary of three glands, oblong, truncate, coloured, the length of the germ, and ſtanding round it. *Stam.* filaments nine, erect, compreſſed; glands two, globular, ſeated on the ſides of the baſe of each of the three interior filaments; anthers adnate to the filaments below their tip. *Piſt.* germ egg-ſhaped, within the corolla and calyx; ſtyle rather thick, the length of the ſtamens; ſtigmas ſlightly trifid, obtuſe. *Peric.* receptacle increaſed into a depreſſed-globular drupe, crowned with the converging calyx and corolla, perforated with a navel. *Seed*, nut globular, acuminate, with the converging ſtamens. Linn. Schreb. and Mart.

*Cal.* one-leafed, permanent; ſegments ſix, ovate-acute, ſtraight, concave; three interior ones reſembling petals. *Cor.* none. *Stam.* nine, in ſeveral ranks; filaments compreſſed; anthers fixed below their tips; accompanied by nine yellowiſh, glandular bodies; ſix of which are fixed to the baſe of the three interior ſtamens, one on each ſide; the three others alternate with thoſe ſtamens, oblong, truncate. *Piſt.* germ ſuperior, ovate; ſtyle thick, ſtigma obtuſe, ſlightly trifid. Lam. and Boſc.

*Cal.* one-leafed, globular, leſſened at the border, ſix-cleft, converging; the inner alternate, ſegments (petals, Linn.) a little larger; bractes at the baſe (calyx, Linn.) three, very ſmall. *Cor.* none. *Stam.* filaments twelve, inſerted in a double order into the top of the calyx; the ſix exterior ones fertile, naked at the baſe, oppoſite to the ſegments of the calyx; the ſix interior ones oppoſite to the former; three fertile, with two glands at the baſe of each; three alternate with them, barren (nectary, Linn.), reſembling tubercles; anthers adnate to the anterior ſide of the fertile filaments, two-celled (two-valved from the baſe to the tip?). *Piſt.* germ ſuperior; ſtyle thickiſh; ſtigma obtuſe (ſlightly trifid?). *Peric.* capſule globular, one-ſeeded; covered by the converging, ſomewhat-berried, calyx. Juſſ.

Eſſ. Ch. *Corolla* reſembling a calyx, ſix-cleft; nectary, three truncate glands ſurrounding the germ; interior filaments glanduliferous. Drupe one-ſeeded. Willd.

Belly of the mature calyx globular, berried, inveſting the ſeed. Filaments ſix or nine; interior ones with two glands at the baſe. Nut ſuperior, one-ſeeded, without valves. clothed with the berried calyx. Gært.

Obſ. Authors differ ſo much with reſpect to the parts of fructification, that we have given the above deſcriptions ſeparately and at full length.

Sp. 1. C. *filiformis*, Linn. Sp. Pl. Gært. tab. 27. f. 4. Lam. Pl. 323. Jacq. Hiſt. Amer. 115. tab. 79. "Filiform, lax, enneandrous; calyx entirely covering the nut." *Stems* paraſitical, twining, ſlender, ſucculent, branched, leafleſs, putting out numerous warts, reſembling the feet of caterpillars, by which they adhere ſo ſtrongly to the ſtems and leaves of ſhrubs, as not to be ſeparated from them; and when they have affixed themſelves to theſe, they no longer draw any nouriſhment from the ſoil. *Flowers* white, with a ſmall tinge of red, very ſmall, in lateral looſe ſpikes, at different diſtances, ſcentleſs. *Fruit* about the ſize of a pea, pellucid, white, ſhining, ſweet to the taſte; nut black, with a yellow kernel. A native of the Weſt Indies. 2. C. *zeylanica*, Gært. tab. 27. fig. 4. b—G. (Cuſcuta rumbut-putri, Rumph. Amb. 5. p. 49. tab. 184. fig. 4. C. ind. & zeyl. Herm. 67. & 42. Burm. Zeyl. 84.) "Flowers hexandrous; calyx not covering the whole nut." The green, tender twigs producing a few very ſmall leaves, coming out ſeveral together. *Calyx* furniſhed at the edge with ſix, pale, obtuſe, concave, diſtant ſcales, reſembling little teeth; three of them ſhorter, and a little without the others, but all converging. *Stamens* in a ſingle order within the ſcales; three ſhorter, correſponding with the larger ſcales, awl-ſhaped; three longer, placed within the ſmaller ſcales, furniſhed on each ſide near the baſe with a globular gland, as in the preceding. *Nut* globular, terminated by a ſhort ſtyle and three ſtigmas, of a dark cheſnut colour, ſmooth, one-celled, valveleſs. Gært. A native of the Eaſt Indies. Linnæus and moſt other authors conſider the Eaſt and Weſt Indian plants as one and the ſame ſpecies; but Gærtner ſeparates them, and if his deſcription of the latter, taken from a ſpecimen of the fruit preſerved in the Leyden muſeum, be accurate, they are certainly diſtinct. 3. C. *corniculata*, Linn. Mant. 277. Burm. Ind. 93. tab. 33. fig. 1. (Caſſutha cornea, Rumph. Amb. 7. p. 56.) "Branches woody, ſpinous." *Branches* a foot long, the thickneſs of a finger; ſpines ſolitary, recurved. *Leaves* ſhorter than the ſpines, lanceolate-linear. *Berries* nearly ſeſſile. A native of mountains in the iſland of Celebes; received alſo from Java by Burman in 1758. Linnæus refers it to this genus on the authority of Burman, but recommends a more accurate examination of its parts of fructification. Juſſieu doubts whether it really belongs to this genus, ſince it differs ſo much from the preceding ſpecies in the ſpines and diſpoſition of the parts.

*Propagation and Culture.* The firſt ſpecies, according to Miller, is eaſily propagated in the ſummer months by cuttings, which ſhould be kept a week in the ſtove before they are planted, that the part cut may have time to heal. They will take root in about ſix weeks, if planted in ſmall pots plunged in a moderate hot bed, and not over watered. They may then be planted ſeparately in ſimilar pots, filled with light ſandy earth; and may be plunged again into the hot-bed, till they have taken freſh root, when they ſhould be removed to the dry ſtove, where they muſt conſtantly remain, being allowed but little water in winter, and a large ſhare of freſh air in the warm days of ſummer.

Cassyta *polyſperma*, Hort. Kew. See Rhipsalis.

CAST, a term in *Sculpture*, for the impreſſion of any figure taken in bronze, plaiſter, wax, or other fuſible material. The original of this word is kaſter, Daniſh, a throw, becauſe the fuſed matter is thrown on the figure of which the impreſſion is to be taken. The proceſs is as follows: plaſter of Paris is mixed with water in a baſon or pan, and ſtirred with a ſpatula until its conſiſtence is like that of batter for pan-cakes; it is then poured on any figure, for inſtance, a human hand, or foot, previouſly greaſed or oiled in the ſlighteſt manner poſſible, which will prevent the adheſion of the plaſter: after a few minutes the plaſter will dry to the hardneſs of ſoft ſtone, taking the exact impreſſion of every part, even the minuteſt pores of the ſkin. This impreſſion, the reverſe or hollow of the original ſubject (like a ſeal in compariſon with its impreſſion), is called the mould, which being taken off from the figure that produced it, muſt be ſlightly greaſed, and then plaſter, mixed with water as before, may be poured into this firſt impreſſion or mould, and remaining until it is hardened, and then relieved, or taken from the mould, is the exact image of the original figure. If the figure is flat, having no deep hollows or high projections, it may be moulded in one piece; if its ſurface is varied with great hollows and projections, it muſt be moulded in many pieces fitted together, and held in one or more outſide or containing pieces. Pliny mentions caſting faces from nature in the early practice of Greek ſculpture. This uſeful art ſupplies the painter and ſculptor with exact repreſentations from nature of limbs, bodies, heads of men and inferior animals, anatomical ſubjects, draperies, and plants; it multiplies models of all kinds, and is now practiſed in ſuch perfection, that caſts of the antique ſtatues are made ſo preciſely like the originals in proportion, outline, and ſurface, that no difference whatever is diſcoverable, excepting in colour and materials. See Bronze and Bronze *caſting*.

Cast, among *Wax Chandlers*, denotes a ladleful of melted wax, poured on the wicks of candles made by the ladle.

Cast, among *Founders*, is applied to tubes of wax, fitted in divers parts of a mould of the ſame matter, by means of which, when the wax of the mould is removed, the melted metal is conveyed into all the parts which the wax before poſſeſſed.

Cast, among *Bowlers*. See Bowling.

Cast alſo denotes a cylindrical piece of braſs, or copper, ſlit in two, lengthwiſe, uſed by the founders in ſand to form a canal or conduit in their moulds, whereby the metal may be conveyed to the different pieces intended to be caſt.

Cast, among *Plumbers*, denotes a little brazen funnel, at one end of a mould, for caſting pipes without ſoldering, by means of which the metal melted is poured into the mould.

Cast *of the country*, with *Miners*, the colour of the earth.

Cast, in *Falconry*, denotes a ſet or couple of hawks.

To *caſt* a hawk to the perch, ſignifies to ſet her upon it.

Cast, in *Rural Economy*, a term applied to ſome kinds of inſects. Thus a caſt of bees ſignifies a ſwarm or flight of bees. See Bees.—Alſo, a word ſometimes applied to poultry, when they loſe their feathers, or moult. It is alſo applied to the changing of the hair and hoofs of horſes. Horſes caſt or ſhed their hair at leaſt once in a year. Every ſpring they caſt the winter coat, and take a ſummer one; and ſometimes in the end of autumn they put on their winter hair, in caſe they have been ill fed, farried, or clothed, or kept in a cold ſtable. Sometimes they caſt likewiſe their hoofs; when this happens, they ſhould be turned out into a paſture for ſome length of time.

CAST, among the *Hindoos*, denotes a tribe, or number of families of the ſame rank and profeſſion; and this diviſion, which is ancient and peculiar, has very generally prevailed in India. This diſtribution ſeems to have proceeded from a crafty prieſthood in order to fix their own ſuperiority or preponderance. Prior, ſays Dr. Robertſon, (Hiſt. Diſq. concerning India, p. 231) to the records of authentic hiſtory, and even before the moſt remote æra to which their own traditions pretend to reach, this ſeparation of profeſſions had not only taken place among the natives of India, but the perpetuity of it was ſecured by an inſtitution which muſt be conſidered as the fundamental article in the ſyſtem of their policy. The whole body of the people was divided into four orders or caſts. According to all the writers of antiquity, indeed, the Indians are ſaid to be divided into ſeven tribes or caſts. See Strabo, l. xv. p. 1029. Diod. Sicul. lib. ii. p. 153. Arrian, Indic. c. 10. But they were probably led into this error by conſidering ſome of the ſubdiviſions of the caſts, as if they had been a diſtinct independent order. However, from the concurrent teſtimony of the beſt informed modern travellers, we learn, that there were no more than four original caſts. In a work entitled, "La Porte Ouverte, ou la vraye Repreſentation de la Vie, des Mœurs, de la Religion, et du Service des Bramines, qui demeurent ſur les Coſtes de Choromandel, &c." compiled before the middle of the 17th century, by Abraham Roger, chaplain of the Dutch factory at Pullicate, we have a diſtinct account of theſe caſts. No doubt can now be entertained with reſpect either to the number or the functions of the caſts, as both are aſcertained from the moſt ancient and ſacred books of the Hindoos, and confirmed by the accounts of their own inſtitutions, given by Brahmins eminent for their learning. According to them, the different caſts proceeded from Brahma, the immediate agent of the creation under the Supreme Power, in ſuch a manner as to eſtabliſh both the rank which they were to hold, and the office which they were required to perform; ſo that to mingle or confound them would be deemed an act of the moſt daring impiety.

The members of the firſt caſt, called the *brahmins*, from the mouth (wiſdom), and deemed the moſt ſacred, had it for their province, to pray, to read, to inſtruct, to ſtudy the principles of religion, to perform its functions, and to cultivate the ſciences. They were the prieſts, the inſtructors, and philoſophers of the nation. The members of the ſecond order, called *Chehteree*, from the arms (ſtrength); to draw the bow, to fight, to govern; were entruſted with the government and defence of the ſtate. In peace they were its rulers and magiſtrates; in war they were the generals who commanded its armies, and the ſoldiers who fought its battles. The third order, called the *Bice*, from the belly and thighs (nouriſhment); to provide the neceſſaries of life by agriculture and traffic; was compoſed of huſbandmen and merchants. The fourth caſt denominated the *Sooder* from the feet (ſubjection); to labour, to ſerve; conſiſted of artiſans, labourers, and ſervants. Subordinate to theſe caſts is a fifth, or adventitious claſs, denominated *Burrun Sunker*, ſuppoſed to be the offspring of an illicit union between perſons of different caſts. Theſe are moſtly dealers in petty articles of retail trade. (See preface to the code of Gentoo laws, p. 46 and 99.) This adventitious caſt is not mentioned, as Dr. Robertſon ſuppoſes, by any European author. The diſtinction was too nice to be obſerved by them, and they ſeem to conſider the members of this caſt as belonging to the *Sooder*. Beſides theſe acknowledged caſts, there is a race of unhappy men, denominated on the Coromandel coaſt *Pariars*, and, in other parts of India, *Chandalas*. Theſe are outcaſts from their original order, who, by their miſconduct, have forfeited all the privileges of it. Their condition is, without doubt, the loweſt degradation of human nature. If a Pariar approach a *Nayr*, i. e. a warrior of high caſt, on the Malabar coaſt, he may put him to death with impunity. Water and milk are conſidered as defiled even by their ſhadow paſſing over them, and cannot be uſed until they are purified. (Ayeen Akbery, vol. iii. p. 243.) Every Hindoo who violates the rules or inſtitutions of his caſt ſinks into this degraded ſituation. Hence it is that the Hindoos ſo reſolutely adhere to the inſtitutions of their tribe, becauſe the loſs of caſt is, to them, the loſs of all human comfort and reſpectability; and is a puniſhment, beyond compariſon, more ſevere than excommunication in the moſt triumphant period of Papal power.

The four original caſts are named, and their functions deſcribed in the "Mahabarat," the moſt ancient book of the Hindoos, and of higher authority than any with which Europeans are hitherto acquainted. Baghvat-Geeta, p. 130. The ſame diſtinction of caſts was known to the author of Heeto-pades, another work of conſiderable antiquity tranſlated from the Sanſkreet, p. 251.

The members of one caſt can never quit his own, or be admitted into another; ſo that the ſtation of every individual is unalterably fixed, his deſtiny is irrevocable, and the walk of life is marked out, from which he muſt never deviate. Moreover, the members of each caſt adhere invariably to the profeſſion of their forefathers; and from generation to generation, the ſame families have followed, and will always continue to follow, one uniform line of life. However, though the line of ſeparation be ſo drawn as to render the aſcent from an inferior to a higher caſt abſolutely impoſſible, and it would be regarded as a moſt enormous impiety if one in a lower order ſhould preſume to perform any function belonging to thoſe of a ſuperior caſt; yet, in certain caſes, the Pundits declare it to be lawful for perſons of a high claſs to exerciſe ſome of the occupations allotted to a claſs below their own, without loſing their caſt by doing ſo. Pref. of Pundits to the Code of Gentoo Laws, p. 100. Accordingly we find Brahmins employed in the ſervice of their princes, not only as miniſters of ſtate (Orme's Fragments, p. 207), but in ſubordinate ſtations. Many officers of the army, particularly in the Mahratta ſtates, have been Brahmins; and many ſeapoys in the ſervice of the Eaſt India company, eſpecially in the Bengal preſidency, are of the Brahmin caſt. Another fact concerning the caſts deſerves notice. An immenſe number of pilgrims, amounting in ſome years, to more than 150,000, viſit the pagoda of Jaggernaut in Oriſſa, one of the moſt ancient and revered places of Hindoo worſhip, at the time of the annual feſtival in honour of the deity to whom the temple is conſecrated. The members of all the four caſts are allowed promiſcuouſly to approach the altar of the idol, and ſeating themſelves without diſtinction, eat indiſcriminately of the ſame food. This ſeems to indicate ſome remembrance of a ſtate prior to the inſtitution of caſts, when all men were conſidered as equal.

Such arbitrary arrangements of the various members, compoſing a community ſeem, at firſt view, to be adverſe to improvement either in ſcience or arts, and the artificial barriers that ſeparate different orders of men tend to circumſcribe the operations of the human mind within a narrower ſphere than nature has allotted to them. Hence genius muſt ſometimes be checked in its career, and talents fitted to ſhine in an higher ſphere be confined to the functions of an inferior caſt. Neverthelefs, theſe arrangements of Indian policy are adapted to the general ſtate of ſociety, though they may be attended with partial inconvenience; and they ſerve to accompliſh the object of the firſt Indian legiſlators, which was to employ the moſt effectual means of providing for the ſubſiſtence, the ſecurity, and the happineſs of all the members of the community over which they preſided. With this view they ſet apart certain races of men for each of the various profeſſions and arts neceſſary in a well-ordered ſociety, and appointed the exerciſe of them to be tranſmitted from father to ſon in ſucceſſion. This ſyſtem, though repugnant to the ideas which we, who are placed in a very different ſtate of ſociety, may have formed, are better adapted to the attainment of the end propoſed, than a careleſs obſerver is apt to imagine. An Indian, on his entrance into life, knows the ſtation which he is deſtined to occupy, and the functions which he is to perform; and from his earlieſt years, he is trained to the habit of doing, with eaſe and pleaſure, that which he muſt continue to do through life. To this may be aſcribed that high degree of perfection conſpicuous in many of the Indian manufactures; and though veneration for the practices of their anceſtors may check the ſpirit of invention, yet, by adhering to theſe, they acquire ſuch an expertneſs and delicacy of hand, that Europeans, with all the advantages of ſuperior ſcience, and the aid of more complete inſtruments, have never been able to equal the exquiſite execution of their workmanſhip. To this early diviſion of the people into caſts, we muſt likewiſe aſcribe a ſtriking peculiarity in the ſtate of India; the permanence of its inſtitutions, and the immutability in the manners of its inhabitants. What now is in India, ſays Dr. Robertſon, always was there; and is likely ſtill to continue; neither the ferocious violence and illiberal fanaticiſm of its Mahomedan conquerors, nor the power of its European maſters, have effected any conſiderable alteration. The ſame diſtinctions take place, the ſame arrangements in civil and domeſtic ſociety remain, the ſame maxims of religion are held in veneration, and the ſame ſciences and arts are cultivated; and hence, in all ages, the trade in India has been the ſame. This ingenious writer adduces the diviſion into caſts as one evidence of the ancient and high civilization of the Hindoos. But it has been obſerved by Mr. Pinkerton, (ſee Mod. Geog. vol. ii. p. 259.) that the error of his argument conſiſts in his confounding caſts with trades, while in reality they are totally diſtinct, as neither a prieſt, a ſoldier, a farmer, nor a labourer is a tradeſman. Separation of trades argues refinement; but from the Hindoo caſts nothing can be concluded, except that agriculture exiſted at their inſtitution. Beſides, when he adds that "what now is in India, always was there," he evinces rather a ſingular love of hypotheſis. All we know from antiquity is, that the caſts exiſted in the time of Strabo, Arrian, and Pliny, and perhaps were not known even in the time of Alexander. If we ſuppoſe that they exiſted three centuries before the Chriſtian æra, we have only a proof that agriculture and merchandize were then known in Hindooſtan; and yet the firſt tribe that paſſed from the centre of Aſia might, even in that caſe, have only begun to people the north of Hindooſtan a few centuries, or a thouſand years before the Chriſtian æra. Among the followers of Bouddha or Boodh, in the Birman empire, and in Siam, the diſtinction of caſts is utterly unknown. Dr. Buchanan (Aſiatic Reſearches, vol. vi. p. 251.) in tracing the origin of the doctrine of caſt eſtabliſhed in Hindooſtan, refers to Pliny, (N. H. l. xi. c. 19.) who mentions a diviſion of ranks among various Indian nations, which he calls "vita multipartita;" but from what he ſays, it does not appear to have been univerſal at the time he received his intelligence; neither is it by any means clear, that his "vita multipartita" means caſt. It is to be obſerved, that all Roman citizens followed nearly the ſame mode of life; they were ſoldiers and ſtateſmen; and when not employed in either of theſe capacities, they were all cultivators of the land. To them, therefore, a diſtinction of profeſſions among the citizens of a ſtate would appear ſtrange; and hence this writer inclines to think, that the "vita multipartita" of Pliny more reſembles the diviſion of ranks and profeſſions among the Burmas, or in modern Europe, than it does the caſt of the Brahmins. The deſcription of Pliny, in the paſſage above referred to, neither agrees with the preſent diviſions of the different caſts, nor does it call the learned Brahmins; on the contrary, Pliny ſpeaks of the Brachmanæ not as a claſs and order in ſociety, but as a nation, and as a name common to many nations. He mentions, that Seneca had attempted to procure the names of all the people inhabiting India, and had actually heard of 118 nations. The moſt conſiderable of theſe he afterwards enumerates, lib. vi. c. 17. See Birman *Empire*, Boodh, Brahmins, and Hindoos.

Cast-*away*, in *Sea Language*, the ſtate of a ſhip which is loſt or wrecked on a lee ſhore, bank, or ſhallow.

CASTABALA, in *Ancient Geography*, a town of Aſia, in Cilicia Propria, according to Ptolemy, who places it in the neighbourhood of Mopſueſtia. In the Itinerary of Antonine it is in the route from Conſtantinople to Antioch. M. d'Anville places it at a very ſmall diſtance to the north-weſt of Iſſus.—Alſo, a town of Aſia Minor, in Cappadocia, placed by Strabo near the mountains, who ſays that it had a temple of Diana Peraſia. M. d'Anville places it at the ſource of a river which diſcharged itſelf into the Halys. It was at ſome diſtance E. of Cybiſtra.

CASTABUENA, in *Geography*, a town of Iſtria; ſix miles S. of Capo d'Iſtria.

CASTACIUS Sinus, in *Ancient Geography*, a gulf of Aſia Minor, on the Thracian Boſphorus, S. of the gulf *Cydaminus*.

CASTAGNEUX, in *Ornithology*, a name given to a ſpecies of Columbus, which ſee.

CASTAGNO, Andrea, Dal, in *Biography*, an eminent hiſtorical painter, was born at a ſmall village called Caſtagno, belonging to Tuſcany, in 1409, and being deprived of his parents when young, was employed by his uncle to attend the herds of cattle in the fields. His ſingular talents, which were firſt manifeſted in ſurpriſing efforts to imitate an ordinary painter, whom he accidentally obſerved at work, became the common topic of diſcourſe in Florence, and excited the curioſity of Bernardetto de Medici; ſo that he placed him under the tuition of the beſt maſters at that time in Florence. Andrea, aſſiduouſly improving his advantages, became particularly eminent in deſign, and found full employment. At firſt he painted only in diſtemper and freſco; but at length he learned the ſecret of painting in oil from Domenico Venetiano, who had derived his knowledge of it from Antonello da Meſſina. He was the firſt of the Florentine artiſts who painted in oil; but envying the merit of Domenico, from whom he obtained the ſecret, he determined, with the baſeſt ingratitude, to aſſaſſinate his friend and benefactor. At this time Domenico and Andrea lived together, and were partners in buſineſs. Inſenſible, however, of every obligation, and combining treachery with ingratitude, he way-laid Domenico in the corner of a ſtreet, and ſtabbed him with ſuch ſecrecy, that he eſcaped unobſerved and unſuſpected to his own houſe, where he ſat down with apparent compoſure to work; ſoon after Domenico was conveyed thither to die in the arms of his aſſaſſin. The real author of this atrocious act was never diſcovered, till Andrea, through remorſe of conſcience, diſcloſed it on his death-bed, in 1480. Andrea finiſhed ſeveral conſiderable works at Florence, by which he gained great wealth and reputation; but as ſoon as his complicated villainy became public, his memory was afterwards held in the utmoſt deteſtation. The moſt noted of his works is in the hall of juſtice at Florence, and repreſents the execution of the conſpirators againſt the houſe of Medici. Pilkington.

CASTAGNOLA, in *Geography*, a town of Piedmont, on the Po; 8 miles S. of Turin.

CASTAGNOLE, in *Ichthyology*, a name given by the Italians to the fiſh called by the generality of authors CHROMIS, which ſee.

CASTALDI, CORNELIO, in *Biography*, the deſcendant of a noble family, was born at Feltri about the year 1480, and though educated to the bar, he devoted himſelf to poetry and the ſtudy of polite literature. On his marriage he ſettled at Padua, where he founded a college, and gained univerſal eſteem. He died in 1536. His poems were both Italian and Latin. The former contain ingenious and elevated ſentiments, but are defective in ſweetneſs and elegance of ſtyle. The latter are a happy imitation of the ancients. They were publiſhed at Venice, in 4to. in 1757, by the abbé Conti, with a life of the author prefixed by Signor Farſetti. Nouv. Dict. Hiſt.

CASTALDUS. } See GASTALDUS.
CASTALDY. }

CASTALIA, in *Botany* (ſo called quia uterum totum, quaſi ob pudicitiam, occultent ſpecies hujus generis) Saliſbury Annal. of Botany, vol. ii. p. 71. Paradiſ. Lond. 14. (Nymphæa, Linn.) Claſs and ord. *Polyandria monogynia*. Nat. ord. *Hydrocharides*, Juſſ. *Nymphææ*, Salis.

Gen. Ch. *Cal.* perianth four or five-leafed, ſurrounding the margin of the receptacle. *Cor.* petals from twenty to thirty, inſerted into the pericarp from the baſe to the middle. *Stam.* filaments from ſixty to a hundred and fifty, inſerted into the pericarp above the petals, free. *Piſt.* ſtyle none; ſtigma with as many rays as there are cells in the fruit. *Peric.* from twelve to twenty-celled, putrefying as the ſeeds ripen. *Nect.* one, in the centre of the ſtigma, globular. *Seeds* from two to three hundred, ſeſſile on the inner ſide of the pericarp, ſurrounded with a follicle.

Flowers white, red, or blue, rivalling the magnolias. It differs from the proper nymphæa in the inſertion of the petals and ſtamens into the pericarp, and not into the receptacle. We have adopted Mr. Saliſbury's generic name, from a confirmed unwillingneſs to change any name once given, unleſs urged to it by the moſt cogent reaſons; but, at the ſame time, we feel ourſelves conſtrained to add, that we cannot concur with that excellent botaniſt in the principle on which he has been induced to chooſe it. Every attempt to extend the ſexual analogy between plants and animals to the mode of operation and its eſſential circumſtances, appears to us to be no leſs adverſe to philoſophical preciſion and truth, than it aſſuredly is to moral purity, and to that delicacy of decorum, which is one of the beſt characters of a rightly cultivated mind.

* *Leaves with a fiſſure extending to the petiole.*

Sp. 1. C. *odorata*. (C. pudica, Salis. Nymphæa odorata, Hort. Kew. Bot. Rep. pl. 297. "Lobes of the leaves divaricated, acuminate; receptacle ſhaped like the nave of a wheel." (Medioliformis, Salis. ſo the word is ſpelt both in the Annals of Botany, and in Paradiſus Londinenſis, but as we are not acquainted with ſuch a Latin word, we preſume it ſhould be modioliformis, which means either a ſmall concave meaſure, or the nave of a wheel.) A native of Virginia. The flowers diffuſe a ſpicy odour, ſomewhat reſembling aniſeed. 2. C. *alba*, white water-lily. (C. ſpecioſa, Saliſb. Nymphæa alba, Linn. Eng. Bot. pl. 160.) "Lobes of the leaves approximate, ſcarcely acuminate; receptacle cymbal-ſhaped." *Calyx-leaves* four, oblong, green underneath, white above, often tinged at the baſe with a light bluiſh-colour. *Petals* white, lanceolate, in ſeveral rows, gradually leſſening in ſize. *Stamens* yellow; outer ones dilated, reſembling petals, with only the rudiments of an anther. *Fruit* ſcarred with the marks of the fallen petals and ſtamens. A native of various parts of Great Britain; in ponds and ſlow ſtreams.

** *Leaves peltate.*

3. C. *Lotus*, (C. myſtica, Saliſb. Parad. Lond. 14. Nymphæa lotus, Bot. Mag. pl. 729. Plant. Rar. Hung. vol. i. fig. 15. Willd. Sp. Pl. Savign. in Ann. du Muſ. vol. i. p. 336. Haſſelq, Reſ. p. 471. Lotus, Alp. Exot. p. 214. with a figure.) "Leaves nearly orbicular, ſharply toothed, ſmooth on both ſides; receptacle ſhaped like the nave of a wheel; inner petals very ſmall." A native of Hungary in the warm waters near Pecze. Mr. Saliſbury obſerves, that though he has followed other authors in quoting the above ſynonyms, he is not abſolutely certain that the Hungarian plant from which his ſpecific character is formed, is the ſame with the Egyptian lotus; for in that, Savigny ſays, the petioles are hiſpid: and, according to Haſſelquiſt, the peduncles are perforated with only four large tubes; whereas the whole herb of the Hungarian plant is ſmooth, and the peduncles are perforated with ſix large tubes. The flowers have the brandy-like ſmell of Nymphæa lutea, continuing expanded till the evening. 4. C. *pubeſcens*. (C. ſacra, Saliſb. Parad. Lond. 14. Nymphæa pubeſcens, Willd. Sp. Pl. Nymphæa lotus, Marq. of Blandford, in Bot. Rep. fig. 391. Roxb. MSS. Ambel, Rheed. Mal. v. 11. fig. 26.) "Leaves oval, toothed, pubeſcent, and ſpotted underneath; petals white, rather unequal." The flowers have a pungent, vinous odour, but very different from that of the Hungarian lotus. A native of Hindooſtan; in marſhes. 5. C. *magnifica*, Saliſb. Parad. Lond. 14. (Nymphæa rubra, Roxb. MSS.) "Leaves nearly orbicular, toothed, pubeſcent underneath, but not ſpotted; petals bright red, rather unequal." *Flowers* ſometimes ſeven or eight inches in diameter, inodorous. A native of Hindooſtan; in marſhes. Dr. Roxburgh regards this and the foregoing as varieties, but Mr. Saliſbury is inclined to keep them diſtinct. They are both ſacred plants in Hindooſtan, and expand in our climate from the very firſt twilight to about ten in the morning, after which they gradually cloſe, and are quite ſhut at noon. 6. C. *edulis*, Saliſb. (Nymphæa coteka, Roxb. MSS.) "Leaves broad-oval, quite entire, pubeſcent underneath; flowers ſmall. A native of Hindooſtan; in marſhes. 7. C. *ampla*, Saliſb. (Nymphæa foliis amplioribus, &c. Brown Jam. p. 243.) "Leaves orbicular, ſharply toothed, ſmooth on both ſides, with very prominent nerves underneath; petals long; anthers lengthened at the tip. A native of La Vera Cruz. 8. C. *cærulea*. (C. ſcutifolia, Saliſ. Nymphæa cærulea, Bot. Mag. pl. 552. Bot. Repoſ. pl. 197. N. flore cæruleo, Breyn. Prod. 2. p. 77.) "Leaves orbicular, more or leſs repand-toothed, ſmooth on both ſides; primary nerves numerous, ſlender; anthers lengthened at the tip." A native of the Cape of Good Hope, now become very common in the Engliſh ſtoves. 9. C. *ſtellata*, (C. ſtellaris, Saliſb. Nymphæa ſtellata, Willd. Sp. Pl. Bot. Rep. 330. Nymphæa cærulea, Jard. Malm. 6. Savign. Ann. du Muſ. vol. i. p. 336. Citambel, Rheed. Mal. vol. ii. p. 53. pl. 26.) "Leaves orbicular, quite entire, ſmooth on both ſides; primary nerves few, but little prominent underneath; rays of the ſtigma very ſhort." A native of Egypt and Hindooſtan, and Mr. Saliſbury believes it to be the plant of New Holland, found by ſir Joſeph Banks in Endeavour river.

CASTALIA, in *Entomology*, a ſpecies of PHALÆNA, (*Bombyx*), found in New Holland.

Castalia, in *Ancient Geography*, a fountain of Aſia, in the ſuburbs of Daphne, near the city of Antioch in Syria. Sozomen ſays that the Pagans believed, that the water of this fountain communicated to thoſe who drank it a knowledge of futurity, and thus produced an effect ſimilar to that at Delphi. The oracle at this fountain is ſaid to have promiſed Adrian, when he was in a private ſtation, the future poſſeſſion of ſovereign power. Jealous of that diſtinguiſhing favour, and fearing leſt others ſhould obtain the like, and avail themſelves of it, as he had done, he ordered, on his aſcent to the throne, this fountain to be ſhut up with ſtones.

Castalia, a river that runs at the foot of mount Parnaſſus, ſacred to the Muſes, hence called *Caſtalides*, the murmurs of which were thought to be prophetic. Upon the banks of this river the Pythian games were celebrated. Pindar refers to it in a verſe of his 7th Olympic ode, thus rendered by Weſt (vol. i. p. 58):

"Where ſweet Caſtalia's myſtic currents ſound."

Castalia, or *Caſtalius fons*, a fountain which diſcharged its water between the ſummits of Parnaſſus. This water inſpired thoſe who drank it with poetic enthuſiaſm. M. Spon, in his Voyage into Greece, ſays, that the waters of this fountain flowed from the declivity of a rock, where they produced fine caſcades. They paſſed near Delphi; and on this account, Phavorinus ſays, Κασταλια κρηνη εν Πυθωνῖ. See Delphi and Parnassus.

CASTALIO, or Castellio, Sebastian, whoſe proper name was *Chateillon*, in *Biography*, was born in 1515, in the mountainous diſtrict of Dauphiné, or, as ſome ſay, of Savoy. Although nothing certain is known concerning his education, he appears to have obtained the eſteem of Calvin, by his acquaintance with the ancient languages, when he was introduced to that reformer at Straſburg, in 1540 and 1541. On his recommendation he was appointed teacher in the college of Geneva; but the intolerant temper of Calvin obliged him to leave this ſituation, after having occupied it about three years. He diſagreed with Calvin with regard to the doctrine of predeſtination; he diſapproved of the civil puniſhment of heretics; he conſidered the Canticles of Solomon as a profane piece; he entertained an opinion peculiar to himſelf concerning Chriſt's deſcent into hell; and he was ſuſpected of having imbibed ſome of the ſentiments of the Anabaptiſts. Such were the offences for which he was expelled Geneva, and became an object of the perſecution both of Calvin and Beza. At Baſil, whither he removed, he obtained the profeſſorſhip of the Greek language; but having a large family, and his circumſtances being indigent, he found it very difficult to procure for them a ſubſiſtence, and to proſecute the ſtudies to which he was devoted. Calvin, who could not be ignorant of his diſtreſſed ſituation, but who ſeems to have felt no compaſſion for him, accuſed him of ſtealing wood. Caſtalio's own relation of the fact is as follows: "Being totally occupied with my tranſlation of the Scripture, and reſolved rather to beg than to quit it, as I dwelt on the banks of the Rhine, I employed myſelf at leiſure hours in catching with a hook the floating wood which was brought down the ſtream by its inundations, that I might warm my family. This wood is public property, and belongs to him that firſt takes it." He appeals to the whole city of Baſil for the truth of his narration, and concludes with thus addreſſing the unſympathizing Calvin; "I could not have thought that you, you who knew me, could have credited ſuch a charge; but that you ſhould publiſh it to the whole world, and tranſmit it to poſterity, is what (although I know you) I could not eaſily have believed!" The conſiſtory at Baſil would not allow him to publiſh his works in that city without animadverſion; he was cited before them; and the curators of the univerſity wiſhed to reſtrain him from theological topics. But whilſt his opinions met with no indulgence, he was ſo much eſteemed for his piety and learning, that his enemies were not able to expel him. However he peaceably cloſed his life of anxiety and indigence at Baſil, in 1563, at the early age of 48 years. Caſtalio was an elegant, though not a profound ſcholar; and his Latinity reſembles that of the modern Italian ſchools. In 1545 he printed at Baſil four books of Scripture-hiſtories in elegant Latin, with a view of communicating to children a knowledge of the facts of their religion, and at the ſame time of giving them a taſte for polite literature. In 1546 he publiſhed a poetical tranſlation of the Sibylline verſes, with notes, together with a proſe verſion of the books of Moſes, which was followed by a tranſlation of David's Pſalms, and the other Scripture ſongs. In 1548 he publiſhed a Greek poem on John the Baptiſt, and a Latin poetical paraphraſe of the prophet Jonas. He likewiſe tranſlated ſome parts of Homer, ſome books of Xenophon, and St. Cyril. His tranſlation of ſome Italian treatiſes of Ochinus, and particularly his "Thirty Dialogues," favouring polygamy, furniſhed one ground of the accuſations againſt him. But his greateſt work was his Latin tranſlation of the Bible, for an account of which ſee *Latin* Bibles. This verſion was the moſt elegant and claſſical that was ever made; but whilſt it has been highly commended by ſome, it has been cenſured by others for an affected uſe of terms, not properly belonging to Jewiſh or Chriſtian theology, and for an improper and paraphraſtical deviation from the original phraſeology. His "New Teſtament," however, is read with pleaſure, and very properly put into the hands of young ſcholars. It is no improbable conjecture, that the hoſtility of Beza againſt him might have been partly owing to the rivalry of his verſion. Caſtalio's French tranſlation of the Bible (ſee *French* Bibles), dedicated to Henry II. of France, and printed at Baſil in 1555, has been charged with the adoption of a low and vulgar phraſeology. Bayle in Gen. Dict.

CASTALOGNE, or Castelogne, a coverlid made of fine wool, on the weaver's loom.

CASTAMENA, or Kastamoni, in *Geography*, a town of Aſiatic Turkey, in the province of Natolia, formerly a large and flouriſhing city, and the ſee of a Greek archbiſhop, but now much reduced in ſize and magnificence; 240 miles eaſt of Conſtantinople. N. lat. 44° 42′. E. long. 34° 22′.

CASTANEA, in *Botany*, Tourn. Gært. Vent. See Fagus *caſtanea*.

Castanea *æquina*, Ray. See Æsculus *Hippo-caſtanum*.

Castanea, in *Entomology*, a ſpecies of *Chermes*, which ſee.

Castanea, in *Natural Hiſtory*, a ſpecies of *Turbo*, and alſo of *Helix*, which ſee reſpectively.

CASTANET, in *Geography*, a town of France, in the department of the Upper Garonne, and chief place of a canton in the diſtrict of Toulouſe, 2 leagues S.S.E. of Toulouſe. The place contains 1320, and the canton 6339, inhabitants; the territory includes $107\frac{1}{2}$ kiliometres and 16 communes.

CASTANETS, Castagnettes, or Castanettas, ſmall muſical inſtruments of percuſſion, in pairs, with which the Moors, Spaniards, and Bohemians mark the meaſures and ſteps in their dances, holding two in each hand. They conſiſt of two little round pieces of dried wood, and hollowed in the manner of ſpoons, of which the concavities are placed over each other, faſtened to the thumb, and beat from time to time with the middle finger, to mark the ſteps and geſtures.

Each *caſtanet* is kept in its place by a ſtring paſſing through a hole pierced through an eminence left for that purpoſe at the ſide of the caſtanet, and which ſerves as a neck.

There is a notation for caſtanets to mark the time, and the two hands ought at leaſt to have as many characters as there are notes in a bar. Dextrous performers will double and triple the notes aſſigned them.

The tablature for the caſtanets is marked with the uſual characters of the time-table, placed above and below the ſame ſtaff or line; thoſe above for the left hand, and thoſe below for the right. The bars, whether a ſingle line or a five line ſtaff, are to be marked by a perpendicular line. There ought likewiſe to be a clef, and a character for time at the beginning of each tune.

This article is taken from the new *Encycl. Meth.*; but we are unable to diſcover the uſe of clefs for a monotonous inſtrument, or rather for an inſtrument on which no tuneable ſound can be produced.

CASTANETTO, in *Geography*, a town of the iſland of Corſica; 13 miles N.E. of Corte.

CASTANHEIRA, a town of Portugal, in the province of Eſtramadura; 6 leagues N.E. of Liſbon.—Alſo, a town of Portugal, in the ſame province; 8 leagues E.S.E. of Coimbra.—Alſo, a town of Portugal, in the province of Beira; 2½ leagues E. of Aveiro.

CASTANIA, in *Ancient Geography*, a town of Italy, near Tarentum; ſuppoſed to be that which is now called *Caſtellaneta*.

CASTANOVITZ, in *Geography*, a town of Croatia, ſeated on the river Unna, and ſubject to the houſe of Auſtria. N. lat. 45° 40′. E. long. 17° 20′.

CASTAX, in *Ancient Geography*, a town of Spain, mentioned by Appian, and ſuppoſed to be the ſame with the *Caſtulon* of Livy.

CASTEL, LOUIS BERTRAND, in *Biography*, a geometrician and philoſopher, born at Montpellier in 1688, and who entered into the ſociety of Jeſus in 1703. He made himſelf known to Fontenelle and to father Tournemine by his eſſays and ſketches of new invention, which promiſed the greateſt ſucceſs. The young man was at this time in Provence, but was invited to the capital. Caſtel removed from Thoulouſe to Paris in 1720. He ſupported the idea of his talents which his eſſays had excited. The firſt work he publiſhed was his "Treatiſe on Univerſal Gravitation," in 2 vols. 12mo. 1724. All nature, according to him, depends on two principles, the weight of bodies and their tendency to motion; the one, which inceſſantly precipitates them to repoſe, the other, which re-eſtabliſhes their motion. This doctrine, the key of the ſyſtem of the univerſe, as he pretended, did not ſatisfy the abbé de ſaint Pierre. Though a friend of the mathematician, he attacked him; the Jeſuit anſwered. The writings on both ſides manifeſted a conſiderable portion of wit and ingenuity in the combatants, but it was of a ſingular kind. The ſecond work of father Caſtel was his "Plan for an Abridgment of the Mathematics," Paris, 1727, in 4to. which was ſoon followed by a "Univerſal Mathematic," 1728, 4to. This work was applauded both in England and France, and the Royal Society of London opened its doors to the author. Dict. Hiſt.

His "Clavecin Oculaire," or ocular harpſichord, though ſilent, made a conſiderable noiſe in the world, and excited much curioſity and conſiderable expectation among opticians as well as muſicians. His idea of producing the ſame pleaſure to the eye by the melody and harmony of colours, as the ear received from the ſucceſſion and combination of muſical tones, was publiſhed in 1725. Sir Iſaac Newton, having diſcovered (Optics, book i. p. 2. prop. 3.) that the breadths of the ſeven primary colours in the ſun's image, produced, by the refraction of his rays through a priſm, are proportional to the ſeven differences of the lengths of the eight muſical ſtrings, D, E, F, G, A, B, C, D, when the intervals of their ſounds are T, H, t, T, t, T, t, H: which order is remarkably regular. Smith's Harmonics. From this analogy, Pere Caſtel ſets off by telling us that there is a fundamental and primitive ſound in nature to which we may give the name of *ret*, or C.

There is alſo a primitive and original tone which ſerves for baſe and fundamental to all colours, which is blue.

There are three eſſential ſounds which depend on this primitive tone of C, and which together compoſe the perfect, primitive, and original chord, which is CEG.

There are likewiſe three original colours dependent on the blue; they are compounded of no other colours, and they produce the reſt; theſe three colours are blue, yellow, and red. The blue is the key-note, the red the fifth, and the yellow the third. There are five tones, C, D, E, G, A; and two ſemi-tones, F and C. In the ſame manner there are five principal colours, blue, green, yellow, red, and violet: and two ſemi-tone colours, which are orange and indigo.

The muſical ſcales, c, d, e, f, g, a, b. The ſcale of colours is blue, green, yellow, orange, red, and violet. Theſe are the data of father Caſtel, upon which he has founded his organ or harpſichord of colours.

It would be uſeleſs to analyſe and critically examine his plan, which is truly viſionary, falſe in its ratios, and incapable of producing the promiſed effects.

After being tried in all parts of Europe, particularly in London, about the year 1756, when the plan and pretended effects were publiſhed in an Engliſh pamphlet,—but its exhibition was ſoon neglected and forgotten, and has been ſcarcely heard of ſince:—he died in 1767, leaving behind him the character of a viſionary projector, whoſe eccentricities, though wild, were innocent; and if he did not inſtruct mankind, he contributed to their idle amuſements.

Pere Caſtel was the dupe of a fertile and lively imagination. His ſyſtems were at firſt mere hypotheſes; but he cheriſhed them ſo long, that, by degrees, he fancied he had realized them. "The New general Syſtem of Nature," by Newton, in 1743, in 4to. did him more honour, but it diſpleaſed others. He reſpected the Engliſh philoſopher, without allowing his doctrine to be the true ſyſtem of the world. "Newton and Deſcartes," ſays he, "have infinite "merit for their invention. The latter had more facility "and elevation, the former leſs facility and more depth; "which is nearly the character of the two nations; the "French build loftily, the Engliſh profoundly. Both were "ambitious of framing a world, as Alexander was of con"quering it; and both ſaw nature on a large ſcale." Caſtel wrote much in the "Memoirs de Trevoux;" he treated an infinite number of ſubjects, but none deeply. However, "he thought (ſays his biographer,) a great deal, and often well."

CASTEL, in *Geography*, a town of Germany, in the duchy of Carniola; 13 miles S.S.W. of Gottſchee.—Alſo, a town of Germany, in the circle of Bavaria, and Upper Palatinate; 10 miles S.W. of Amberg.

CASTEL *de las Guardas*, a town of Spain, in the province of Andaluſia; 8 leagues from Seville.

CASTEL *Belforte*, a town of Germany, in the country of Tyrol; 11 miles N.N.W. of Trent.

CASTEL-*Branco*, a town of Portugal, in the province of Beira; encompaſſed by a double wall, flanked with ſeven towers, and defended by an old caſtle; containing two churches, two hoſpitals, a poor-houſe, two convents, and

5700 inhabitants. It is ſituated between the two rivers Ponſul and Vereza, which run into the Tagus, and diſtant 18 leagues S.E. from Coimbra. N. lat. 39° 35′. W. long. 8° 0′.

Castel-*Franc*, a town of France, in the department of the Lot; 1 league N.W. of Luzech.

Castel-*Franco*, a town of the iſland of Candia, near the ſouth coaſt; 16 miles S.S.W. of Retimo.—Alſo, a ſmall but ſtrongly fortified town on the frontier of the Bologneſe in Italy.

Castel-*Jaloux*, a town of France, in the department of the Lot and Garonne, and principal place of a canton, in the diſtrict of Marmande, ſeated on the Avance; it carries on a conſiderable trade in honey, cattle, and wine; 7½ leagues W.N.W. of Agen, and 3½ S.W. of Tonneins; the place contains 1757, and the canton 6013 inhabitants; the territory includes 195 kiliometres and 10 communes.

Castel-*Leone*, a ſmall town of Italy, in the Cremoneſe; 15 miles N.N.W. of Cremona.

Castel-*Melhar*, a town of Portugal, in the province of Beira; 5 leagues N. of Pinhel.

Castel-*Moron*, a town of France, in the department of the Lot and Garonne, and chief place of a canton, in the diſtrict of Marmande; 3 leagues W. of Villeneuve d'Agen. The place contains 2011, and the canton 7425 inhabitants; the territory includes 152½ kiliometres and 9 communes.

Castel-*Moron de Albert*, a town of France, and ſeat of a tribunal, in the department of the Gironde; 9 leagues S.E. of Bourdeaux.

Castel-*Nova*, a town of Portugal, in the province of Beira; 3 leagues N. of Caſtel-Branco.

Castel-*Rapani*, a town of European Turkey, in the Morea; 32 miles S.S.E. of Miſitra.

Castel-*Rodrigo*, a town of Portugal, in the province of Beira; 3½ leagues N.W. of Pinhel.

Castel-*Roſſo*, an iſland in the Mediterranean, near the coaſt of Caramania, about a league in length. It has a large village, inhabited by Greeks, and defended by a caſtle; on the ſouth ſide it has a good harbour; 90 miles E. of Rhodes. N. lat. 36° 7′. E. long. 29° 31′.

Castel-*Roſſo*. See Caristo.

Castel-*Sagrat*, a town of France, in the department of the Lot and Garonne; 6 leagues E. of Agen.

Castel-*Sarrazin*, a town of France, in the department of the Upper Garonne, and chief place of a diſtrict; 10 leagues N.N.W. of Toulouſe. The place contains 7,000, and the canton 10,696 inhabitants; the territory includes 152½ kiliometres and 7 communes.

Castel *St. Pietro*, a town of Germany, in the country of Tyrol; 12 miles S.S.W. of Bolzano.

Castel-*Selino*, a town of the iſland of Candia, on the ſouth coaſt, near the weſtern extremity; 21 miles S.W of Canea.

Castel-*Torneſe*, a town of European Turkey, in the Morea, ſeated on an eminence, near the ſea, and defended with a caſtle; 10 miles S. of Chiarenza.

Castel-*Ubaldo*, a town of Aſiatic Turkey, in the province of Caramania; two miles S.W. of Alameh.

CASTELANZA, a town of Italy, in the Milaneſe; 14 miles N.W. of Milan.

CASTELBONIFACIO, a town of European Turkey, in the iſland of Candia; 12 miles S.S.W. of Candia.

CASTELHOLM, a town of Sweden, in the iſland of Aland. This place is famous for the ruins of an ancient palace, ſeated on an inſulated rock of red granite, and built with red granate and brick, which commands a pleaſing, though bounded, proſpect of two ſmall lakes, whoſe banks riſe into gentle eminences ſkirted with wood. To this ſolitary rock Eric XIV. was, in 1571, confined by his brother John III.; and the dungeon, in which he was impriſoned, ſtill bears the name of the apartment of Eric.

CASTELIA, in *Botany*, Cavan. Icon. 583. Claſs and ord. *Didynamia gymnoſpermia.*

Gen. Ch. *Cal.* perianth tubular, permanent, with five furrows and five teeth. *Cor.* monopetalous, bilabiate; tube curved, longer than the calyx; upper lip upright, bifid; lower lip trifid; lobes obtuſe. *Stam.* four; two longer. *Piſt.* germ ſuperior; ſtyle curved at its ſummit; ſtigma tranſverſely oval. *Peric.* the enlarged calyx encloſing two nuts; nuts two-celled, with two envelopes, the inner one thin and red. *Seeds* oblong, cylindrical, one in each cell.

The only known ſpecies is a native of Brazil. *Root* annual. *Stem* four-ſided, ſmooth. *Leaves* oppoſite, petioled, oval-wedge-ſhaped; upper ones toothed; lower ones crenulate. *Flowers* reddiſh, in terminal racemes; bractes lanceolate.

CASTELL, Edmund, in *Biography*, a learned divine, was born in 1606 at Hatley, in the county of Cambridge, and educated at Emanuel college in the univerſity of Cambridge, whence, after a reſidence of many years, he removed to St. John's college for the benefit of its library. The great work which engaged his chief attention for 17 years, and, as he ſays, coſt him almoſt the incredible ſum of 12000l., was his "Lexicon Heptaglotton," or Dictionary of ſeven tongues. After expending upon it his whole fortune, and being thus reduced to great diſtreſs, he was appointed, in 1666, king's chaplain and Arabic profeſſor at Cambridge, and preſented to a prebend at Canterbury. His Lexicon was publiſhed in 1669, but moſt of the copies remained unſold. Beſides ſome other preferments, the laſt that was conferred upon him was the rectory of Higham Gobion, in Bedfordſhire. Among other ill-requited and unprofitable labours, he aſſiſted Dr. Walton in his Polyglott Bible, for which he tranſlated ſeveral books of the Old and New Teſtament, and diligently examined the eaſtern verſions. At the reſtoration, he publiſhed a thin 4to. pamphlet to the honour of Charles II., containing copies of verſes in all the languages of his Lexicon. He died at his rectory in 1685, and bequeathed all his MSS. to the univerſity of Cambridge. About 500 copies of his Lexicon, which came into the poſſeſſion of his niece and executrix, were conſigned in an old houſe to the mercy of the rats, ſo that ſcarcely one complete volume was left.

Castell, *county of*, in *Geography*, a principality of Germany, in the circle of Franconia, ſituated between the biſhopric of Wurzburg, the principality of Anhalt, the lordſhip of Limburg, and the county of Schwarzenburg: deriving its name from an ancient caſtle, which was deſtroyed by the peaſants in 1525. It pays 18 florins for a Roman month, and is taxed at 18 rix-dollars 84 kreutzers.

CASTELLA, Castles, in *Britiſh Antiquity*, were one of the three kinds of fortifications that were built along the line of Severus's wall; the other two being denominated *ſtations* and *towers*. Theſe caſtles were neither ſo large nor ſo ſtrong as the ſtations, but much more numerous, being no fewer than 81. In ſhape and dimenſion they were exact ſquares of 66 feet every way. They were fortified on every ſide with thick and lofty walls, but without any ditch, except on the north ſide, on which the wall itſelf, raiſed much above its uſual height, with the ditch adjoining it, formed the fortification. The caſtles were ſituated in the intervals between the ſtations, generally at the diſtance of about ſeven furlongs from one another; and guards were conſtantly kept in them by a competent member of men detached from the neareſt ſtations. Horſl. Brit. Rom. p. 108.

CASTELLAIN, *Caſtellanus*, the lord, owner, or captain of a caſtle; and ſometimes the conſtable of a fortified houſe. Bract. lib. v. tract. 2. c. 16. 3 Edw. I. c. 7. It has likewiſe been taken for him that hath the cuſtody of one of the king's manſion-houſes, called by the Lombards *curtes*, in Engliſh *courts*; though they are not caſtles or places of defence. 2. Inſt. 31. And Manwood, in his Foreſt Laws, ſays there is an officer of the foreſt called *caſtellanus*.

CASTELLAN, in *Biography*. See CHATEL.

CASTELLAN, the name of a dignity or office in Poland. The caſtellans are ſenators of the kingdom, but ſenators of the lower claſs; and in diets, ſit on low ſeats behind the palatines, or great ſenators. They are a kind of lieutenants of provinces, and command a part of a palatinate under the PALATINE. They are divided into grand and petty caſtellans: their office, in time of peace, is merely nominal; but when the military or feudal ſervices are required, they are the lieutenants of the palatines, under whom they command the troops of the ſeveral diſtricts.

CASTELLANA, CIVITA, in *Geography*, a town of Italy, between Otricoli and Rome, the firſt of ancient Latium, on the approach to Rome by the Flaminian way. This town is conſidered by many antiquarians as the Feſcennium of the ancients. It ſtands upon a high rock, and muſt formerly have been a place of great ſtrength, but it is now in no very flouriſhing condition.

CASTELLANE, in *Geography*, a town of France, and principal place of a diſtrict in the department of the Lower Alps, ſituate at the foot of a mountain, on the river Verdon, in a pleaſant and fertile ſpot; 12 leagues W. of Nice. The place contains 1962 and the canton 4577 inhabitants; the territory includes 225 kiliometres and 13 communes.

CASTELLANETTA, a town of Naples, in the province of Otranto, the ſee of a biſhop, ſuffragan of Tarento; 18 miles E.S.E. of Matera.

CASTELLANI, in *Ancient Geography*, a people of Spain, who inhabited the Tarragonenſis, to whom Ptolemy aſſigns four cities. They occupied a part of Catalonia at the foot of the Pyrenées.

CASTELLANIA, a Spaniſh word, derived from Caſtello or Caſtile, and denoting a ſeparate territory, in the manner of a province, independent of any other; in which its particular laws are obſerved, and which has a juriſdiction over all the places dependent on its capital.

CASTELLANO, a town of Naples, in the province of Bari; eight miles S.W. of Monopoli.—Alſo, a town of Italy, in the Veroneſe, belonging to the ſtate of Venice; 16 miles S.W. of Verona.

CASTELLANUS, or DU CHATEL, HONORÉ, in *Biography*, a native of Brabant, ſtudied medicine at Montpellier, where he took his degree of doctor in 1544. Being ſoon diſtinguiſhed for his learning, and abilities, he was ſent for to Paris, and in ſucceſſion filled the office of phyſician to Henry II., Francis II., and Charles IX. By his intereſt with Charles, he obtained a conſiderable addition to the ſalaries of the ſeveral profeſſors of the univerſity at Montpellier, which they have acknowledged by an inſcription, in Latin, placed over the entrance into the college, the only memorial left of him, excepting an oration, on the excellence of the practice of phyſic, ſpoken on ſome occaſion, not now known, and printed in 1555, 8vo. He died in November 1569, attending a part of the army of his ſovereign to which he was alſo principal phyſician. Eloy. Dict. Hiſt.

CASTELLANUS, or DU CHATEL, PETER, was born at Grammont in Flanders in the year 1585. Shewing an early diſpoſition to literature, he was ſent to Mons, and afterwards to Orleans, where he acquired ſuch a proficiency in the knowledge of the Greek language, that he was invited to Lovain, in 1609, to fill the chair of Greek profeſſor, then vacant. In 1618, he took the degree of doctor in medicine. The ſame year he publiſhed at Antwerp, "Vita illuſtrium Medicorum, qui toto orbe ad hæc uſque tempora, floruerunt," 12mo. It is a ſmall volume, but the author has contrived, within that compaſs, to introduce the moſt ſtriking paſſages in the lives of the more eminent phyſicians, who had flouriſhed from the earlieſt period, to his time, with brief notices of their works. Although the accounts are taken almoſt entirely from other writers, whoſe words are frequently copied, yet the volume will always be eſteemed, both as a monument of the learning, and diligence of the author, and for the perpetual references given to the ſources from whence he obtained his information. He died in February 1632, aged only 47 years. Haller. Bib. Med. Eloy. Dict. Hiſt.

CASTELLANY, the diſtrict or extent of land under the juriſdiction of a lord caſtellan.

The province of Flanders is divided into ſo many caſtellanies, each of which bears the name of the capital; as the caſtellany of Liſle, of Ypres, of Ghent, &c. The court of caſtellany was anciently compoſed of the caſtellan, a fiſcal, procurator, notary, regiſter, &c. In Poland, a caſtellany is a petty government under the adminiſtration of a CASTELLAN.

CASTELLARIUS, the keeper, or curator, of a caſtellum. Gruter gives an ancient ſepulchral inſcription in memory of a caſtellarius.

CASTELLARO, in *Geography*, a town of Italy, in the duchy of Mantua; 10 miles E. of Mantua.—Alſo, a town in the ſtate of Genoa; 11 miles N.E. of Vintimiglia.

CASTELLATION, *Caſtellatio*, in *Middle Age Writers*, the act of building a caſtle, or of fortifying a houſe, and rendering it a caſtle. By the ancient Engliſh laws, caſtellation was prohibited, without the king's eſpecial licence. Du Cange.

CASTELLAUN, in *Geography*, a town of France, in the department of the Rhine and Moſelle, and chief place of a canton, in the diſtrict of Simmern; 22 miles S.S.W. of Coblentz. The place contains 620 and the canton 4977 inhabitants: the territory includes 28 communes.

CASTELLENGO, a town of Italy, in the country of Vercelli; eight miles S.E. of Biella.

CASTELLI, BENEDICT, *Abbate*, in *Biography*, an eminent mathematician, was born of an ancient and noble family at Breſcia, in the year 1577. In 1595, he entered into a monaſtery of the order of St. Benedict in his native city. He was for ſome time a diſciple of Galileo at Florence, and aſſiſted him in his aſtronomical obſervations, and afterwards maintained a regular correſpondence with him. Under his name the apology of Galileo againſt the cenſures of Leudovico delle Colombe and Vincent di Grazia appeared, though it was principally written by Galileo himſelf. From 1615 to 1625, he occupied the mathematical chair at Piſa. In 1625, Caſtelli was invited to Rome by pope Urban VIII. and made mathematical profeſſor in the college della Sapienza. The ſubject of his particular attention, and in the inveſtigation of which he chiefly excelled, was the motion of water; and in 1628, he publiſhed two works upon it, which gained him much reputation; viz. "The Menſuration of running Waters," and "Geometrical Demonſtrations of the Menſuration of running Waters." Theſe have been lately inſerted in the collection of the author's works on ſimilar topics, printed at Florence, with other treatiſes, on the laguna of Venice, on the improvement of the Pontine, Bologneſe, Ferrareſe, and Romagneſe marſhes, &c. Guglielmini, though in other things he impugns Caſtelli, allows him the honour of having firſt applied geometry to the motion of water; and Montucla (Hiſt. Math. t. ii. p. 201.) calls him "The Creator of a new Part of Hydraulics." He died at Rome in 1644.

Castelli, Bernard, an eminent painter of hiſtory and portrait, was born at Genoa in 1557, and ſtudied his art under Andrea Semini and Luca Cambiaſo, preferring the principles of the firſt, and in his practice imitating both. He afterwards viſited Rome for farther improvement, and there he acquired diſtinction. He had a ready invention, and when he choſe to exert himſelf, he had ſufficient correctneſs and grace; but he became a manneriſt, and frequently adopted the colour and diſpatch of Vaſari and Zucchari. The moſt diſtinguiſhed poets of his time, whoſe portraits he painted, celebrated him in their verſes. Marino and Taſſo, in particular, were his intimate friends; and he made deſigns for the Jeruſalem of the latter. The ſubject of his altar-piece for St. Peter's at Rome was the call of St. Peter to the apoſtleſhip; but this was afterwards removed, to make room for one executed by Lanfranco. The principal works of Caſtelli are at Genoa and Turin. As an engraver, his ſtyle ſomewhat reſembled that of Cornelius Bus. Among other works in this department is a ſet of prints for Taſſo's poems. He died in 1629. Pilkington, by Fuſeli. Strutt.

Castelli, Valerio, ſon of the former, was born at Genoa, in 1625, and received his firſt inſtructions in the ſchool of Domenico Fiaſella; but he gained his principal knowledge in the art of painting by ſtudying the works of the moſt celebrated maſters at Milan and Parma. He thus much improved his taſte of deſign, compoſition, and colouring. His reputation for drawing, colouring, and the elegant turn of his figures, placed him in a rank far ſuperior to his father. His moſt favourite ſubjects were battles; and his horſes are drawn in an admirable ſtyle. In this ſtyle of painting he is ſaid to have united the fire of Tintoretto with the fine taſte and compoſition of Paolo Veroneſe. With reſpect to hiſtorical ſubjects he poſſeſſed great merit both in eaſel pictures and in thoſe of larger dimenſions. The cupola of the church, and the annunciation at Genoa, which is deſcribed as a noble compoſition, was painted by this maſter; and at Florence, in the palace of the grand duke, there is another excellent painting, the ſubject of which is the Rape of the Sabines. His picture, repreſenting Chriſt taken down from the Croſs, is in the collection of the earl of Pembroke at Wilton; and it is ſaid that more of the eaſel pictures of Caſtelli are to be found in the collections of England than in any other part of Europe. His health was injured by his aſſiduous labour; and he died at Genoa at the early age of 34, in 1659. Pilkington.

Castelli, G. B. See Castello.

CASTELLIAR, in *Geography*, a town of Germany, in the county of Tyrol; 7 miles S.S.E. of Bolzano.

CASTELLINA, a town of Italy, in the duchy of Parma; 12 miles W.N.W. of Parma.

CASTELLIO, a town of Naples, in the province of Principato Citra; 16 miles W.S.W. of Policaſtro.

CASTELLO della Abbate, a town of Naples, in the province of Principato Citra; 29 miles S.W. of Cangiano.

Castello *d'Albori*, a town of Naples, in the province of Principato Ultra; 10 miles N.E. of Benevento.

Castello *Arrageneſe*, a ſea-port town on the N.W. coaſt of the iſland of Sardinia, with a good harbour, the ſee of a biſhop, ſuffragan of Saſſari; 18 miles N.E. of Saſſari. N. lat. 40° 56'. E. long. 8° 57'.

Castello *Bianco*, a town of Genoa; 7 miles N. of Albenga.

Castello *di Chiara*, a town of Sardinia; 43 miles N.E. of Cagliari.

Castello *Franco*, a town of Naples, in the province of Calabria Citra; 4 miles N.W. of Coſenza.—Alſo, a town of Naples, in the province of Principato Ultra; 14 miles E.N.E. of Benevento.—Alſo, a town of Italy, in Treviſan, belonging to the ſtate of Venice; 9 miles W.S.W. of Trevigno.—Alſo, a town in the ſtate of Genoa; 11 miles N.E. of Vintimiglia.

Castello *St. Giovanni*, a town of Italy, in the duchy of Piacenza; 10 miles W. of Piacenza. It was taken by the French in 1796.

Castello *Guidone*, a town of Naples, in the county of Moliſe; 11 miles N. of Moliſe.

Castello *Lanbazo*, a town of Portugal, in the province of Entre Duero é Minho; 1½ league E. of Braga.

Castello *Maggiore*, a town of Italy, in the republic of Lucca; 12 miles W.N.W. of Lucca.

Castello *a Mare*, a town of Sicily, in the valley of Mazzara; 19 miles W.S.W. of Palermo.

Castello *a Mare di Stabia*, a ſea-port town of Naples, in the province of Principato Citra, built near the ruins of Pompeia and Stabia, the ſee of a biſhop, ſuffragan of Sorrento, containing 6 pariſh churches and 10 convents; 4 miles N.E. of Sorrento. This is a long town, lying at the bottom of the bay, ſheltered to the ſouth by high mountains that approach ſo near to the water-edge, as to leave only a very narrow ſlip for the buildings, many of which are boldly and beautifully placed on the lower points of the hills. The king has a charming villa above the city. The port is ſmall and artificial, more frequented by lattin-ſail barks than by ſhips. This place roſe by the ruin of the inland towns.

Castello *a Mare della Brucca*, a town of Naples, in Principato Citra; 18 miles W. of Policaſtro.

Castello *Marinba*, a town of Portugal, in the province of Entre Duero é Minho; 5 miles N.W. of Barcelos.

Castello *della Minerva*, a town of Naples, in Principato Citra; 16 miles S.W. of Amalfi.

Castello *Monardo*, a town of Naples, in the province of Abruzzo Ultra; 14 miles S.W. of Aquila.

Castello *Mondo*, a town of Portugal, in the province of Beira; 2½ leagues E.N.E. of Beira.

Castello *Novato*, a town of Italy, in the duchy of Milan; 20 miles W. of Milan.

Castello *Nuova*, a town of Italy, in the county of Friuli, belonging to the ſtate of Venice; 18 miles N.W. of Udina.

Castello *Nuovo di Terzi*, a town of Italy, in the duchy of Piacenza; 5 miles S. of Buſſeto.

Castello *Nuovo*, a town of the duchy of Modena; 9 miles N.N.W. of Reggio.

Castello *Nuovo*, a town of Italy in the Breſſan; 22 miles S. of Breſcia.

Castello *de Nubrega*, a town of Portugal, in the province of Entre Duero é Minho; 2 leagues N. of Braga.

Castello *de Onigo*, a town of Italy, in the Treviſan, belonging to the ſtate of Venice; 12 miles N.W. of Trevigno.

Castello *della Orſo*, a town of Naples, in Principato Citra; 6 miles S.S.W. of Salerno.

Castello *Pignano*, a town of Naples, in the county of Moliſe; 3 miles E.S.E. of Moliſe.

Castello *de la Plana*, a town of Spain, in the province of Valencia, near the ſea-coaſt, containing one pariſh church, ſix convents, and 10,733 inhabitants. This place is famous for its rich collection of pictures. Near Caſtellen is the river Mijares, which ſupplies water to the aqueduct of Almaſora, a tunnel that paſſes through a rock of limeſtone, and being executed in 1240, deſerves to be regarded as ſtupendous.

Castello *di Ponte*, a town of Italy, in the Belluneſe, belonging to the ſtate of Venice; 4 miles N. of Belluno.

Castello *Puſtedengo*, a town of Italy, in the Lodeſan; 10 miles S.S.E. of Lodi.

Castello *de Real*, a town of Portugal, in the province of Entre Duero é Minho.

Castello *della Ripa*, a town of Italy, in the duchy of Spoleto; 8 miles S.W. of Todi.

Castello *di Sangro*, a town of Naples, in the province of Abruzzo Citra; 15 miles S.E. of Sulmona.

Castello *Seprio*, a town of Italy, in the duchy of Milan; 19 miles N.W. of Milan.

Castello *de Sorotico*, a town of Portugal, in the province of Entre Duero é Minho; 2 leagues N.E. of Amarante.

Castello *Vel*, a town of Spain, in Catalonia; 3 leagues from Terramoſi.

Castello *Vetere*, a town of Naples, in the province of Calabria Ultra, containing one collegiate and nine pariſh churches, and 4 convents; 12 miles N. of Gierace.

Castello *de Vide*, a town of Portugal, in the province of Alentejo, containing about 5700 inhabitants; 3 leagues E.N.E. of Pontalegre.

Castello *dell Volurno*, a town of Naples, in the country of Lavora; 11 miles W.S.W. of Capua.

CASTELLORUM Operatio, caſtle work, or ſervice and labour done by the inferior tenants for the building and upholding of caſtles of defence; towards which ſome gave perſonal aſſiſtance, and others paid their contributions. This was one of the three neceſſary charges, to which all lands among our Saxon anceſtors were expreſsly ſubject. See Castle.

CASTELLUCCIO, in *Geography*, a town of Naples, in the province of Capitanata; 6 miles from Troja. This is a kind of double town; one part of which is agreeably ſituated upon a rocky eminence, with a declivity that ſhews all the houſes as if they were upon terraces, and the other part, built at its foot, amidſt a delightful tract of fields, rich in vines and fruit-trees, and bounded by rows of towering oaks.

CASTELLUM, in *Ancient Geography*, a place of Paleſtine, on the ſea of Galilee, near Tiberias.—Alſo, an epiſcopal ſee of Africa, in Numidia.—Alſo, an African epiſcopal ſee, in Mauritania Cæſarienſis.—Alſo, a town and epiſcopal ſee of Africa, in Mauritania Setifienſis.—Alſo, a place of Italy, S.W. of Faventia, belonging to the Boii.

Castellum *Druſi* et *Germanici*, a place mentioned by Tacitus (Annal. 156.), on the other ſide of the Rhine; the ruins of which ſtill bear the name of "Alt Konigſtein," or the old royal monument.

Castellum *Jaberitanum*, an epiſcopal city of Africa, in Mauritania Cæſarienſis.—C. *Medianum*, an epiſcopal ſee of Africa, in Mauritania Cæſarienſis; called "Monumentum Medianum" by Ammianus Marcellinus.—C. *Menapiorum*, *Keſſel*, a fortreſs of Gaul, on the left of the Meuſe.—C. *Minoritanum*, an epiſcopal ſee of Africa, in Mauritania Cæſarienſis.—C. *Morinorum*, *Caſſel*, a place of Gaul, called ſimply *Caſtellum* in the Itinerary of Antonine; it was at ſome diſtance to the eaſt from Bononia, and N.E. of Taruenna. See Cassel.—C. *Ripenſe*, an epiſcopal ſee of Africa, in Mauritania Cæſarienſis.—C. *Romanum*, *Brittenburg*, a fortreſs at the extremity of the Rhine, called by ſome authors Arx *Britannica*, which ſee.—C. *Tatroportenſe*, an epiſcopal ſee of Africa, in Mauritania Cæſarienſis.—C. *Titulianum*, or *Titulitanum*, an epiſcopal ſee of Africa, in Numidia.—C. *Trajani*, *Caſſel*, a fortreſs ſituate to the right of the Rhine, at a place where it received the name of Mænus, the Mayne. This fortreſs was repaired by Julian, and is different from another ſituated a little more to the eaſt, and which is mentioned by Tacitus.

CASTELLUS, Bartholomew, in *Biography*, an Italian phyſician of conſiderable learning and eminence, practiſed at Meſſina the latter part of the 16th and beginning of the 17th centuries. He was author of two works, both for a long time extremely popular. "Totius Artis Medicæ, Methodo diviſa, Compendium et Synopſis, in qua quidquid ab Hippocrate, Galeno, Avicenna, ſummiſque in Arte Doctoribus ſcriptum eſt, continetur," Meſſan. 1597, 4to. This has been many times reprinted, the laſt time at Geneva, in 1746. "Lexicon Medicum Græco-Latinum," Venice, 1607, 4to. This work ſtill retains its popularity. It has paſſed through numerous editions, and been much enlarged and improved, particularly by Vander Linder, and afterwards by Jacob Bruno. The laſt edition was printed at Naples in 1761. Haller Bib. Med.

CASTELLUZZA, in *Geography*, a town of Naples, in the province of Principato Citra; 12 miles E. of Salerno.

CASTELLUZZO di Schiavi, a town of Naples, in the province of Capitanata; 8 miles E. of Troja.

CASTELMARMORA, a town of Aſiatic Turkey, in the province of Natolia; 28 miles S.W. of Mogla.

CASTELMIRABEL, a town of the iſland of Candia, in the Mediterranean, on the north coaſt of a large bay; 18 miles W. of Settia.

CASTELNAU, Michael De, in *Biography*, an eminent commander and ſtateſman in the reigns of Charles IX. and Henry III. of France, was employed in many important negociations, and being five times ambaſſador in England, reſided here for 10 years ſucceſſively in his firſt embaſſy. He took an active part in favour of Mary queen of Scots; endeavouring to reconcile her to her huſband Darnly, and interceding in her favour under the harſh treatment of Elizabeth. He died in 1592. The memoirs of his negociations, publiſhed by Le Laboureur, in 2 vols. fol. in 1659, and reprinted at Bruſſels in 1731, are regarded among the moſt curious and valuable materials of the age, and written in a pure and unaffected ſtyle, without paſſion or partiality. His daughter Catherine was miſtreſs of four languages, and tranſlated her father's memoirs into Engliſh. Nouv. Dict. Hiſt. Robertſon's Hiſt. of Scotland, vol. i. p. 318, &c. vol. ii. p. 128.

Castelnau *de Bonnafoux*, in *Geography*, a town of France, in the department of the Tarn, and diſtrict of Alby; one league W. of Alby.

Castelnau *ſur Gupie*, a town of France, in the department of the Lot and Garonne; 1½ league N.N.W. of Marmande.

Castelnau *de Magnoac*, a town of France, and ſeat of a tribunal, in the department of the Higher Pyrenées, and chief place of a canton in the diſtrict of Bagnères; 20 miles E. of Tarbe. The place contains 1200, and the canton 10,296 inhabitants; the territory comprehends 192½ kiliometres and 32 communes.

Castelnau *de Medoc*, a town of France, in the department

ment of the Gironde, and chief place of a canton in the diſtrict of Bourdeaux; 14 miles N.N.W. of Bourdeaux. The place contains 1008, and the canton 12,574 inhabitants; the extent of the territory comprehends 950 kiliometres and 19 communes.

Castelnau *de Montmirail*, a town of France, in the department of the Tarn, and chief place of a canton in the diſtrict of Gaillac; 2 leagues N.W. of Gaillac. The place contains 2523, and the canton 9715 inhabitants; the territory includes 162⅘ kiliometres and 15 communes.

Castelnau *de Montratier*, a town of France, in the department of the Lot, and chief place of a canton in the diſtrict of Cahors; 4 leagues S. of Cahors. The place contains 4271, and the canton 8861 inhabitants; and the territory includes 182¼ kiliometres and 8 communes.

Castelnau *de Rivière-baſſe*, a town of France, in the department of the Upper Pyrenées, and chief place of a canton in the diſtrict of Tarbe; 7 leagues N.N.E. of Pau. The place contains 1252, and the canton 4574 inhabitants; the territory includes 72⅘ kiliometres and 8 communes.

Castelnau *de Strettefond*, a town of France, in the department of the Upper Garonne, and diſtrict of Toulouſe; 4 leagues N. of Toulouſe.

CASTELNAUDARY, a town of France, and principal place of a diſtrict, in the department of Aude; before the revolution, the capital of Lauragais; ſeated on an eminence, near the grand reſervoir which ſupplies the canal of Languedoc. The place contains 7610, the north canton 13,813, and the ſouth canton 12,629 inhabitants; the territory of the former includes 285 kiliometres and 19 communes; that of the latter 145 kiliometres and 13 communes. N. lat. 43° 19′. E. long. 1° 51′.

CASTELOMONTE, a town of Piedmont, in the marquiſate of Ivrea; 7 miles S.S.W. of Ivrea.

CASTELPROTISSA, a town on the ſouth coaſt of the iſland of Candia; 25 miles S.S.W. of Candia.

CASTELVETRO, Lewis, in *Biography*, an eminent Italian ſcholar, was a native of Modena, deſcended from a noble family, and born in 1505. Educated in the univerſities of Bologna, Ferrara, Padua, and Sienna, he graduated at the latter place in law, being deſigned by his father for that profeſſion; but his natural inclination led him to the cultivation of polite literature. In his native place he was aſſiduous in promoting letters among his countrymen, and became an active member of the newly-erected academy. His connection with this learned body occaſioned his being ſuſpected of hereſy, and his quarrel with Annibal Caro (ſee Caro) contributed to his being accuſed to the inquiſition as unſound in the faith. In 1557 he was cited to Rome, but dreading an examination, he for ſome time concealed himſelf; but at length, in 1560, he repaired thither, and after being thrice examined, he thought it moſt prudent to make his eſcape; the conſequence of which was the publication of a ſentence, previouſly pronounced againſt him, as a contumacious heretic. At Chiavenna, where he ſettled for ſome time, he gave private lectures to ſeveral ſtudents on Homer, and on the rhetoric addreſſed to Herennius. From thence he removed to the court of Maximilian II. at Vienna, and dedicated to that emperor his commentary on Ariſtotle's Poetics. Being driven from Vienna by the plague, he returned to Chiavenna, where he died in 1571. Caſtelvetro was an accurate grammarian, and an acute though ſomewhat too cenſorious critic. He took pains in perfecting the Italian language, and wrote remarks of a grammatical and critical kind on ſeveral authors, both ancient and modern, which were firſt publiſhed by Muratori in 1727. His "Examination of the Rhetoric addreſſed to Herennius," was printed in 1653. His "Expoſition of Petrarch's Poems," which he left unfiniſhed, was publiſhed by his nephew. He compoſed various pieces in Latin verſe, with great elegance; and his ſkill in Greek was manifeſt in his verſion, with a commentary, of Ariſtotle's Poetics, and in his Italian tranſlation of Chryſoſtom's expoſition of the Goſpels. He alſo ſtudied the Provençal tongue, and tranſlated, in conjunction with Barbieri, into Italian, many of the poems and lives of the Provençal poets, and gave a grammar of the language. Gen. Dict. Gen. Biog.

CASTER, in *Geography*, a town of Germany, in the circle of Weſtphalia, and duchy of Juliers; 8 miles E.N.E. of Juliers.

Caster, or Caistor. See Castor.

CASTETS, a town of France, in the department of Landes, and chief place of a canton in the diſtrict of Dax; 7 miles N. of Dax. The place contains 877, and the canton 5429 inhabitants; the territory includes 640 kiliometres and 10 communes.

CASTHANÆA, or Castanæa, in *Ancient Geography*, a town of Theſſaly, in Magneſia, at the foot of mount Pelion.

CASTIGATION, *Caſtigatio*, among the Romans, the puniſhment of an offender by blows, or beating with a wand or ſwitch. Caſtigation was chiefly a military puniſhment, the power of inflicting which on the ſoldiery was given to the tribunes. Some make it of two kinds, one with a ſtick or cane, called *fuſtigatio*; the other with rods, called *flagellatio*; the latter was moſt diſhonourable.

Castigations, in a *Literary Senſe*, denote corrections, or emendations of the text of an ancient writer.

CASTIGATORY. See Cucking *ſtool*.

CASTIGLIOLA, in *Geography*, a town of Piedmont, in the county of Aſti; 5 miles S.S.W. of Aſti.

CASTIGLIONE, Baldassar, in *Biography*, an eminent ſtateſman and writer of Italy, was born of noble parents at the villa of Caſatico near Mantua in 1468. He ſtudied firſt at Milan, and commenced his political career at an early period, as page to Lewis Sforza, duke of Milan. In 1499 he attached himſelf to Gonzaga, marquis of Mantua, and in 1504 entered into the ſervice of Guidubaldo, duke of Urbino, in whoſe court, which was then the favourite reſort of ſcience and letters, he reſided for ſeveral years. This duke ſent him as his embaſſador to Henry VII. king of England in 1506, and in the following year he attended in the ſame capacity on Lewis XII. then at Milan. On the death of Guidubaldo in 1508, he remained in the ſervice of the new duke, Francis Maria della Rovere, whom he accompanied in ſeveral military expeditions as lieutenant-general of the army of the church under pope Julius II. He was recompenſed for his ſervices in 1513 by the caſtle of Nuvilara near Peſaro, and the grant was confirmed to him by pope Leo X. Upon his return to Mantua, he regained the favour of the duke Gonzaga, whom he had offended by quitting his ſervice, and in 1516 married Maria Hippolita, a lady no leſs illuſtrious for her birth than for her beauty and accompliſhments. This lady was diſtinguiſhed by her Latin and Italian compoſitions, both in proſe and verſe; and her poems are publiſhed in a collection of the works of five illuſtrious Italian poets. This connection terminated in 4 years by the death of Hippolita. Caſtiglione was afterwards employed by the marquis Frederic of Mantua as his embaſſador to Rome, where he remained ſeveral years and enjoyed that kind of literary ſociety to which he was attached and of which he was a principal ornament. He was particularly diſtinguiſhed by his reſearches into all the remains of antiquity, and by his exquiſite

quiſite taſte in the fine arts. In 1522 he returned to Mantua, with a view of ſerving his prince in the war againſt the French. When he again viſited Rome, he was employed by pope Clement VII. in 1524 as nuncio to the emperor Charles V.: but failing to terminate the difference between the imperial and papal courts, and incurring unjuſt ſuſpicions on the part of Clement, his diſappointment and anxiety were the occaſions of an illneſs, of which he died at Toledo in 1529. Five years after his death, his body, which had been interred with great ſolemnity in the cathedral, was removed by order of his mother to a church five miles from Mantua, in which a ſuperb mauſoleum was erected to his memory, with an inſcription written by cardinal Bembo. His ſtatue has been ſince placed in the royal academy of Mantua. The moſt celebrated of his works is "Il Cortigiano" or the Courtier, diſcuſſing the manner of living in courts, ſo as to be uſeful and agreeable to the prince, and containing a variety of reflections and maxims, delivered in an eaſy and elegant ſtyle, which has rendered it an original and claſſical work. It was finiſhed in 1518, reviewed by his friend Bembo, but not printed till the year 1528. It paſſed ſpeedily through ſeveral editions, and was tranſlated into moſt of the languages of Europe. It is denominated by the Italians "the golden book," and a fine edition of it was printed ſo lately as 1733 at Padua, with the life of the author prefixed by Bernardino Marliani. On account of ſome free expreſſions it was inſerted in the liſt of prohibited books; but in 1576 the author's ſon obtained for a corrected form of it a licence from the congregation of the index. The letters of Caſtiglione were publiſhed at Padua in 2 vols. in 1769, with annotations by the abbate Saraſſi. His Italian poetical compoſitions have been publiſhed ſeparately, and his Latin productions were publiſhed in the firſt volume of the "Deliciæ Poet. Italor. by Gruter." Moreri. Gen. Biog.

CASTIGLIONE, GIOVANNI BENEDETTO, called GRECHETTO, an admired painter, was born at Genoa in 1616, and ſtudied firſt under Battiſta Pagi and afterwards in the academy of Giovanni Andrea de Ferrari; but he owed his chief improvement to the inſtructions of Vandyck, who at that time reſided at Genoa. His manner of deſign, in all branches of his art, was grand; and he equally ſucceeded in all; in ſacred and profane hiſtory, landſcape, cattle, and portrait; all which he executed with an equal degree of truth, freedom, and ſpirit. His predominant inclination, though he poſſeſſed an univerſal genius, led him to ſelect rural ſcenes and paſtoral ſubjects, markets, and animals, in which he had no ſuperior. He combined with great readineſs of invention a bold and noble tint of colouring, elegant, and generally correct, drawing, a judicious touch, and a free and firm pencil: and he alſo happily applied the chiaro-ſcuro, which he thoroughly underſtood, through all his works. In the chapel of St. Luke's church at Genoa, is an excellent picture by this maſter: alſo in the Palazzo Brignolè is a grand compoſition; and at Palazzo Caragha in the ſame city is an hiſtorical picture of Raphael concealing the Teraphim from Laban, in which the figures and animals are very fine. The etchings of this celebrated artiſt, which are numerous, are ſpirited, free, and full of taſte: and their effect is, in general, powerful and pleaſing. Among his moſt eſtimable plates, may be reckoned the following, all from his own compoſitions: viz. "Animals coming to the ark;" "Laban ſearching for his gods in the tent of Jacob;" "The angel appearing to Joſeph in a dream;" "The nativity of our Saviour;" "The flight into Egypt;" "The reſurrection of Lazarus;" "Diogenes with his lanthorn;" "A magician with ſeveral animals;" "The little melancholy;" "A ruin with a vaſe, and two men, one of them pointing to a tomb;" two "rural ſubjects, with fauns and ſatyrs;" and two "ſets of heads." He died in 1670. Pilkington. Strutt.

*Franceſco Caſtiglione*, the ſon of Benedetto, was the diſciple of his father, and was born at Genoa. He inherited in a very conſiderable degree the talents of his father, and imitated his ſtyle and manner exactly, in compoſition, handling, and deſign. Many pictures, aſcribed to Benedetto, and occurring in ſales and collections, are thought to be copies after him by his ſon Franceſco, or perhaps originals of the younger Caſtiglione. Pilkington.

CASTIGLIONE, in *Geography*, a town of Italy, belonging to the republic of Lucca, inſulated in the Modeneſe; 18 miles N. of Lucca.—Alſo, a town of Italy, in the republic of Lucca, 8 miles S.W. of Lucca.—Alſo, a town of Italy, in the duchy of Tuſcany, ſituated on a lake near the ſea. This lake, which is two leagues in diameter, and communicates with the ſea, produces great quantities of ſalt. The reſervoirs contain 4,859,000 cubic feet of water, which after evaporation, leave 11,000,000 pounds of ſalt.—Alſo, a town in the ſtate of Genoa; 23 miles E. of Genoa.—Alſo, a town of Naples, in the province of Principato Citra; 5 miles N.E. of Salerno.—Alſo, a town of Naples, in the province of Abruzzo Citra; 6 miles E.S.E. of Civita Borella.—Alſo, a town of Naples, in the province of Calabria Citra; 17 miles S.S.W. of Coſenza.—Alſo, a town of Sicily, in the valley of Demona; 9 miles W.N.W. of Taormino.—Alſo, a town of Italy, in the duchy of Mantua; 9 miles W. of Mantua.

CASTIGLIONE *di Gatti*, a town of Italy, in the Bologneſe; 20 miles S. of Bologna.

CASTIGLIONE *della Stivera*, a town of Italy, and principality, in the duchy of Mantua, defended by ſome fortifications and a citadel; and containing about 3000 inhabitants; 20 miles N.W. of Mantua. In 1796 a battle was fought near this town between the Auſtrians and French, in which the latter took 6000 priſoners.

CASTIGLIONIA, in *Botany*, Flor. peruv. pl. 37. Claſs and order, *polygamia monœcia*.

Gen. Ch. *Cal.* five-leafed, permanent; leaves oblong, the three exterior ones largeſt. *Cor.* Petals five, oblong, villous on the inner ſide. *Stam.* ten. *Piſt.* Germ ſuperior, three-ſided, ſurrounded by five ſcales; ſtyle trifid; ſtigmas three, bifid. *Peric.* Capſule three-ſided, ſix-furrowed, three-celled, three-valved. *Seeds* ſolitary. A ſhrub. *Flowers* in racemes; male ones intermingled with the others and differing from them only in the barrenneſs of the germ. A native of Peru.

CASTIGLUINI, in *Geography*, a town of Naples, in the province of Principato Ultra; nine miles E.N.E. of Conza.

CASTIL BLANCO, a town of Spain, in the province of Andaluſia; five leagues N. of Seville.

CASTILE, a country of Spain, comprehending the provinces of Old and New Caſtile, and the kingdom of Caſtile. Some have referred the origin of this name to a certain old Spaniſh tribe, or nation, called by the Romans "Caſtellani," who are ſuppoſed to have inhabited theſe parts of Spain, as well as Catalonia. But others with greater probability have traced it no higher than the recovery of this country out of the hands of the Moors; at which time, they ſay, there was a ſtrong caſtle built for the defence of the frontier, in which the count, or great officer of the province, reſided, from whence it took its name and its arms. Whilſt *Old Caſtile*, ſo called becauſe it was recovered from the Moors long before that which is ſtyled the *New*, remained under the dominion of the Moors, there were ſeveral great lords who maintained themſelves in the poſſeſſion of certain diſtricts, and who, gradually increaſing in wealth and power, at length ſhook off the yoke of the infidels, and put themſelves under the protection of the kings of Oviedo. According to this account, it is probable that theſe lords had each of them a well fortified manſion, or caſtle; whence, at the emancipation of this province from the yoke of the Moors, it might well receive the name by which it has ever ſince been known. Theſe lords, ſupported by their new protector, were not only able to defend their frontier, but to extend their little territories by their excurſions againſt the Moors, as often as any favourable opportunity occurred, and hence aſſumed the title of counts; and being regarded as feudatories of the monarchs before mentioned, were ſummoned in time of war to repair with their vaſſals to attend the king's ſtandard, and in time of peace were called to the aſſemblies of the eſtates. The firſt of theſe counts, mentioned by name in the Spaniſh hiſtories, is Don Rodriguez, who flouriſhed in the reign of Don Alonſo el Caſto, or the Chaſte, about the cloſe of the 9th century, whom he aſſiſted in his wars againſt the infidels. Caſtile, from being only a county, and ſubject to the kings of Leon, was erected in 1016 into an independent kingdom: and in 1037 the two kingdoms of Leon and Caſtile were united in the perſon of Ferdinand I. of Leon, and II. of Caſtile. This union was rendered perpetual in the perſon of Ferdinand II., after the death of Don Alonſo of Leon, A. D. 1230; from which time theſe two kingdoms have never been ſeparated, but have gradually drawn to them all the other ſovereignties in Spain: thoſe of the Chriſtians by inheritance or marriage, and thoſe of the Moors by conqueſt. Upon the death of Don Juan, king of Arragon, in 1479, Arragon and its dominions were united to the crown of Caſtile, in the perſons of their catholic majeſties Ferdinand and Iſabella, who, in 1474, had been proclaimed king and queen of Caſtile and Leon. See Arragon. After this period the Spaniſh crowns were united and deſcended in the ſame line; and the kingdom of Caſtile was loſt in that of Spain. See Spain.

Castile, *Old*, a province of Spain, with the title of kingdom, was formerly part of the Roman Tarraconenſis, and borders all the way on the ſouth to New Caſtile, from which it is divided by a high chain of mountains, extending directly from weſt to eaſt; on the north it is ſeparated from Aſturias and Biſcay by another range of hills branching out from the Pyrenées; but between theſe two provinces it has a narrow ſlip of land which reaches quite to the bay of Biſcay: on the eaſt it is parted by the Ebro and the mountain of Doea, for a conſiderable length, from Navarre and Arragon: and on the weſt it is bounded by Leon. The greateſt extent of this province from north to ſouth reaches from 40° 10′ to 43° 15′ of N. latitude, and from 1° 30′ to 4° 10′ of W. longitude; i. e. about 180 miles from N. to S. and about the ſame number from E. to W. in thoſe parts where it has both ways the greateſt extent; for its figure is very irregular, and its dimenſions are in various parts very different. The principal rivers in this province are the Ebro, Duero, Piſurga, Arlançon, and Arlança; and the chief towns are Avila, Burgos, the capital, Calahorra, Segovia, Siguenza, and Valladolid. Its climate is ſomewhat different from that of New Caſtile, as it is more mountainous, inſomuch that ſome have repreſented it as a terrace formed by the mountains of Biſcay, or by the Pyrenées, of which theſe are a branch. In ſummer this mountain-plain is deſtitute of water, and burnt up with heat. But, in general, whilſt the vallies are very hot, the upper grounds are proportionably cold and bleak. In this country no other means are employed to counteract the ſeverity of the weather and the bleak winds, which, on the high open plains, are very boiſterous, beſides a large chafing-diſh, (braſero) which is uſually placed beneath the table. Stoves and chimnies are never ſeen in common houſes. Snow covers the tops of the mountains through the ſummer; and it is carried away and ſold in the towns, for cooling their wine. The ſoil, though in various parts cold, is moderately good, and might be rendered much more productive by better cultivation. The wine is much extolled; and the plains are covered with cattle, and more eſpecially with ſheep, the wool of which is much valued.

Castile, *New*, called alſo "The kingdom of Toledo," which was formerly its capital, a province of Spain, bounded on the north by Old Caſtile, from which it is ſeparated by a chain of mountains known by the name of the country through which they run; on the eaſt it is divided by a ſimilar ridge from Arragon and Valencia; on the ſouth it is parted from Andaluſia by the mountains called Sierra Morena, and by an imaginary line from Murcia; and on the weſt it is ſeparated from Eſtramadura and Leon by a ridge of hills called Guadaloupe and La Sarena. Its length from ſouth to north is about 180 miles, and its greateſt breadth about the ſame number, though its form is very irregular. New Caſtile conſiſts of three cantons, viz. La Mancha, the ſouthern part, La Sierra, lying towards the eaſt, and Algaria, which is the northern part. Its principal rivers are the Tagus, Guadiana, Guadalquivir, Xucar, Xarama, and Guadarama, beſides ſeveral others of leſs note. The capital of this province is Madrid. As it is inland and ſurrounded with high mountains, its climate is hotter in ſummer, and colder in winter, than other diſtricts which lie along the ſea-coaſts in the ſame latitude. It is, however, ſalubrious, and the ſoil is generally fertile, but needing cultivation. The northern parts produce fruits and wine, and the ſouthern, good paſtures and fine wool.

Castile *del Oro*. See Terra *Firma*.

CASTILLAN, in *Commerce*, a gold coin, current in Spain, valued at fourteen rials and a half.

Castillan alſo denotes a weight uſed by the Spaniards in the weighing of gold, containing the hundredth part of a Spaniſh pound. It is alſo uſed at Buenos Ayres, and the mines of Chili and Potoſi.

CASTILLE, in *Military Language*, a term that was formerly made uſe of to denote the attack of a tower or caſtle. This attack became alſo a ſort of military ſport or play, in which thoſe who carried it on uſed ſnow-balls. In 1546, the diviſion, being ſurpriſed in one of thoſe attacks, that was executed at *Roche Guyon*, became angry and heated, a circumſtance that coſt the duke d'Enghien his life, and put a period to the games or ſports in France called *Caſtilles*, as that which occaſioned the death of Henry III., put an end to the martial game or exerciſe of tournament.

CASTILLEJA, in *Botany*, (ſo called by Mutis in honour of Caſtillejus, a Spaniſh botaniſt, reſident at Cadiz,) Linn. jun. Supp. p. 47. Schreb. Gen. 1059. Willd. 1205. Juſſ. p. 100. Vent. vol. ii. 299. Claſs and order, *didynamia angioſpermia*. Nat. ord. *Perſonatæ*, Linn. *Pediculares*, Juſſ. *Rhinanthoides*, Vent.

Gen. Ch. *Cal.* perianth one-leafed, tubular, longitudinally cloven in front more than half-way down, nerved, coloured, ſomewhat ſwelling at the baſe. *Cor.* monopetalous, gaping; upper lip long, channelled, curved inwards, emarginate, pubeſcent on the back; lower lip very ſhort, trifid; ſegments acute, with two glands between them inſerted into the throat of the corolla. *Stam.* filaments four, inſerted into the baſe of the corolla, the length of the upper lip, filiform, ſmooth; the lower pair a little ſhorter;

anthers twin, linear, oblique. *Piſt.* germ ſuperior, oblong; ſtyle filiform, the length of the ſtamens; ſtigma ſimple, obtuſe. *Peric.* capſule ovate, compreſſed, two-celled; the partition contrary to the valves. *Seeds* numerous, ſmall.

Eſſ. Ch. Calyx tubular, cloven longitudinally more than half-way down; lower lip of the corolla very ſhort, trifid, with two glands between the ſegments; capſule two-celled.

Sp. 1. C. *fiſſifolia*, Smith Ined. tab. 39. Mut. Amer. vol. i. tab. 11. Lam. Illuſt. pl. 519. fig. 2. "Leaves pinnate-gaſhed near the tip." *Root* perennial, branched, fibrous. *Stem* three or four feet high, herbaceous, or ſomewhat woody, erect, roundiſh, with few branches, pubeſcent. *Leaves* alternate, ſeſſile, ſpreading, entire at the baſe, pinnatifid near the tip, pubeſcent on both ſides, three-nerved; ſegments from three to ſeven; ſtipules none. *Flowers* towards the ends of the larger branches, ſolitary, peduncled, ſpecious, probably ſcarlet; proper bractes none; peduncles round, pubeſcent, ſcarcely one-third of the length of the leaves. A native of New Granada. 2. C. *integrifolia*, Smith Ined. tab. 39. Mut. Amer. vol. i. tab. 12. Lam. Illuſt. Pl. 519. fig. 1. "Leaves linear-lanceolate, entire." *Stem* herbaceous, round, upright, branched, leafy, ſlightly rough, with hairs. *Leaves* alternate, ſeſſile, ſpreading, obtuſe, ſlightly channelled, nerved, pubeſcent on both ſides; ſtipules none. *Flowers* on the elongated ends of the branches, forming a ſort of raceme, each from the axil of its own bracte-ſhaped leaf, a little ſmaller than thoſe of the preceding ſpecies; peduncles filiform, upright, ſhorter than the leaves. A native of New Granada, where both ſpecies were diſcovered by Mutis.

CASTILLO, Castello or Castelli, Gio Batista, in *Biography*, an eminent painter of hiſtory of the 16th century, commonly called *Il Bergamaſco*, in contradiſtinction to Gio. Bat. Caſtelli, a Genoeſe, ſcholar of Cambiaſo, and the moſt celebrated miniature-painter of his time, was born at Bergamo, and conducted to Genoa by Aurelio Buſo of Crema, and left by him in that city. In this forlorn ſtate, he was patroniſed by the Pallavicini family, who ſent him to Rome, where he was formed an architect, ſculptor, and painter, not inferior to Cambiaſo. At Rome, Palomino reckons him among the ſcholars of Michael Angelo. He was the companion of Lucas Cambiaſo, and adopted his technic principles; and we diſcover, ſays Mr. Fuſeli, the ſtyle of Raffaello verging already to practice, but not ſo mannered as that which prevailed at Rome under Gregory and Sixtus. In Cambiaſo we recogniſe a greater genius and more elegance of deſign; in Caſtello, greater diligence, deeper knowledge, a better colour, a colour more nearly allied to the Venetian than the Roman ſchool. Theſe two artiſts aſſiſted each other, even on occaſions where they appeared to be competitors. Thus, at the Nuntiata di Portoria, Lucas on the pannels repreſented the final doom of the bleſſed and the rejected in the laſt judgment; whilſt G. Batiſta on the ceiling, expreſſed the judge in an angelic circle receiving the elect. His attitude and ſemblance ſpeak the celeſtial welcome with greater energy than the adjoined capitals of the words "Venite Benedicti." This is a picture ſtudied in all its parts, of a vivacity, compoſition, and expreſſion, which give to the pannels of Lucas the air of a work done by a man half aſleep. He alſo worked alone; ſuch is the S. Jerome ſurrounded by monks frightened at a lion, in S. Franceſco di Caſtello, and the crowning of St. Sebaſtian after martyrdom in his own church, which is a picture as rich in compoſition as ſtudied in execution, and ſuperior, ſays Mr. Fuſeli, to all my praiſe. This artiſt, though little known in Italy, paſſed the laſt years of his life at Madrid, as painter to the court. He died in 1570, at the age of 70 years. He had two ſons, Fabrizio and Granello, whom he took with him to Spain as his aſſiſtants, whoſe works in the Eſcurial are much commended. Pilkington's Dict. by Fuſeli.

Castillo y Saavedra, Antonio Del, a celebrated Spaniſh painter, was born at Cordova in 1603, and having ſtudied under his father Auguſtin, perfected himſelf in the ſchool of Zurbaran at Seville. On his return to his native place, he was employed in a variety of works, evincing his great ſkill in drawing and deſign, but not equal in colouring. He practiſed in hiſtory, portrait, and landſcape, with great reputation. In 1666, he reviſited Seville, where, on ſeeing ſome of the brilliant productions of Murillo, he gazed on them with ſilent admiration, and then ſuddenly exclaimed, "Caſtillo is no more." After his return to Cordova, he died in leſs than a year of melancholy and deſpair. Caſtillo united the talent of poetry to that of painting. Cumberland's Anecdotes of Spaniſh Painters. Nouv. Dict. Hiſt.

Castillo *de Sancho Abarça*, in *Geography*, a town of Spain, in Navarre; 5 leagues from Tudella.

CASTILLON, a town of France, in the department of the Gironde, and chief place of a canton, in the diſtrict of Libourne; 3 leagues S.E. of Libourne. The place contains 2580, and the canton 10,713 inhabitants; the territory includes 117½ kiliometres and 16 communes.

Castillon, a town of France, in the department of the Arriege, and chief place of a canton, in the diſtrict of St. Girons; 7 miles S.W. of St. Girons. The place contains 742, and the canton 12,112 inhabitants. The territorial extent comprehends 350 kiliometres and 25 communes.

CASTILLONES, a town of France, in the department of the Lot and Garonne, and chief place of a canton, in the diſtrict of Villeneuve-d'Agen; 5 miles E. of Lauzun. The place contains 1756, and the canton 7123 inhabitants: the territory includes 117½ kiliometres and 15 communes.

CASTINE, the ſhire-town of Hancock county, in the diſtrict of Maine, N. America, ſituated on Penobſcot bay. It was ſeparated from Penobſcot, and incorporated in 1796. It takes its name from a French gentleman who reſided here more than 130 years ago.

Castine *River*, which is about 14 miles long, is navigable for 6 miles, and has ſeveral mills at the head of it. It diſcharges itſelf into Penobſcot bay.

CASTING is ſometimes uſed for the quitting, laying, or throwing aſide any thing; thus, deer caſt their horns, ſnakes their ſkins, lobſters their ſhells, hawks their feathers, &c. annually.

Casting *of feathers*, is more properly called *moulting*, or *mewing*.

A horſe caſts his hair or coat at leaſt once a year, viz. in the ſpring, when he caſts his winter coat, and ſometimes at the cloſe of autumn he caſts his ſummer coat, in caſe he hath been ill kept.

Horſes ſometimes alſo caſt their hoofs, which happens frequently to coach-horſes brought from Holland; which being bred in a moiſt, marſhy country, have their hoofs too flabby; ſo that coming into a drier ſoil and leſs juicy provender, their hoofs fall off, and others, that are firmer, ſucceed.

Casting is alſo uſed for diſtributing or diſpoſing the parts of a thing to the beſt advantage.

The caſting of a building is more properly called Compartition.

Theatrical writers ſpeak of caſting a play, i. e. diſpoſing the ſeveral parts or characters to proper actors.

Casting *of candles*, ſignifies filling the moulds with tallow. See Candle.

CASTING *a colt*, in *Rural Economy*, is a term that implies a mare's proving abortive.

CASTING *of drapery*, among *Painters*, denotes the diſtribution of the folds; and the drapery is ſaid to be well caſt, when the folds are diſtributed in ſuch a manner as to appear rather the reſult of mere chance than of art, ſtudy, or labour. In that ſtyle of painting which is called "the grand," the folds of the draperies ſhould be great, and as few as poſſible, becauſe their rich ſimplicity is more ſuſceptible of great lights. But it is an error to deſign draperies that are too heavy and cumberſome, for they ought to be ſuitable to the figures, with a combination of eaſe and grandeur. Order, contraſt, and variety of ſtuffs and folds, conſtitute the elegance of draperies; and diverſity of colours in thoſe ſtuffs contributes extremely to the harmony of the whole in hiſtoric compoſitions.

CASTING, in *Falconry*, is any thing given an hawk to purge and cleanſe his gorge. Of theſe there are two kinds, viz. plumage, i. e. feathers; and cotton: the latter whereof is generally in pellets about the bigneſs of hazel-nuts, made of ſoft fine cotton, and conveyed into her gorge after ſupper. In the morning ſhe will have caſt them out; at which time they are to be obſerved, and from the colour and condition they are found in, the ſtate of her body is conjectured. If they be caſt out round, white, and not ſtinking, nor very moiſt, it is an indication all is well; if otherwiſe, particularly if black, green, ſlimy, or the like, ſhe is diſtempered. The caſting of plumage is obſerved after the ſame manner as that of cotton.

CASTING *a figure*, among *Aſtrologers*, the erecting of a celeſtial theme, and dividing the heavens into houſes.

CASTING, in *Foundery*, is the running of a melted metal into a mould prepared for that purpoſe.

The great importance of a knowledge of caſting to a mechanic, on account of the vaſt quantities of caſt-iron now uſed in machinery, has induced us to give a particular deſcription of this branch of the founder's art.

There are three ſorts of caſting, 1. *open ſand caſting*; 2. *ſand caſting between flaſks*; and 3. *loam-caſting*; in moſt of which, an exact pattern, uſually of wood, of the ſubject to be caſt, is given to the founder.

I. Moſt articles, every part of whoſe ſurface on one ſide is in the ſame plane (which we will call the horizontal plane), and every parallel ſection of which is of the ſame ſize in every part as the horizontal plane, or conſtantly decreaſing as they recede downwards from it, and the edges of all which ſections fall within perpendiculars, let fall from the edges of the plane immediately above it, may be caſt in *open ſand*: becauſe, as the founders expreſs it, every ſuch pattern will *lift* out of the ſand, wherein it has been imbedded as deep as its upper or plane ſurface, to form the mould for the metal.

The floor of every foundery is for many feet deep compoſed of a loamy ſand (of which great quantities are brought to London from near Woolwich) ſo that deep pits may be dug, to bury large moulds in. (See FOUNDERY). An example of open ſand-caſting is ſhewn in *Plate* of *Caſting*, *figs.* 1 and 2, which repreſent the arms of a large wheel, the rim of which is to be ſcrewed on by the flaunches *a*, *a*, *fig.* 1.; *b b* is the arm; *d* is a rib caſt with it to ſtrengthen it, the other ſide of the arm muſt be plain; *e* is the opening through which its ſhaft is to paſs. In the place where the mould is to be made, a layer of ſand, *c d*, *fig.* 2, is lightly ſprinkled through a ſieve on the floor, and the pattern A is preſſed down into it, perfectly level; the next operation is ſhovelling the ſand up all round, level with the top of the pattern, and ramming it down, with a tool, *fig.* 4.; a ſponge is then uſed for ſlightly wetting the ſand all round the edges of the pattern to make it adhere together; the next operation is lifting the pattern out of the ſand by one or more ſcrews, *fig.* 5, ſcrewed into the wood; if the pattern is ſmall, this is done by one or more men, but in very large works it is done by a crane; the cores for the bolt holes through the flaunches, *a*, *a*, *fig.* 1. are made by ſticking pieces of dried clay in the ſand in the proper places, and the core for the hole *e*, made of clay, is alſo ſet in its place; the workman then uſes a pair of bellows for blowing away any ſmall pieces of ſand which may have fallen into the mould. It is now ready for filling with metal; in ſmall works this is done by ladles, and in large, by ſmall ditches made in the ſand, from the mould to the mouth of the furnace: when the mould is filled, the metal is covered up with ſand to keep the air from it.

II. *Sand-caſting* between flaſks is uſed for thoſe articles which if they were cut into two or more pieces (provided the cutting planes were parallel to each other) each ſeparate piece might be caſt in open ſand. A ſpecimen of this ſort of caſting is ſhewn in *fig.* 6, which is an endleſs ſcrew and ſpindle, often compoſed of caſt iron. A B and C D are frames called flaſks, with four handles, *c*, *d*, *e*, *f*, to lift by; *a*, *b*, *l*, *m*, are iron points fitting into holes *g*, *h*, *i*, *k*, in the other flaſk C D, for aſcertaining when they fit each other. The under flaſk C D is ſet upon a board, filled with ſand, and the ſame is rammed tight into it: the workman then takes the pattern E F, and preſſes one half of it into the ſand, and ſmooths the ſand up to the ſides of the pattern with a trowel, *fig.* 3; he then ſets the empty flaſk, A B, over the other, C D, putting its points *a*, *b*, *l*, *m*, into the holes *g*, *h*, *i*, *k*; and after ſprinkling ſome ſand which has been burnt over the ſand in the under flaſk, he fills the upper one with ſand, and rams it down; he next with a piece of wood, put through the ſand in the upper flaſk, makes a hole ſhewn at *p*, to pour the metal through; the upper flaſk, A B, with the ſand in it, is then lifted off by men, or in large works, by a crane, and the pattern, E F, lifted out; the flaſk, A B, is then put on again, and heavy weights are laid on it to keep it down, ready for caſting. It muſt be obſerved, that at every higheſt point of large moulds a ſmall hole muſt be made through the ſand in the upper flaſk, to allow the air to paſs out of the mould when the metal is poured in.

*Figs.* 7, 8, 9, and 10 ſhew the manner of caſting a cog-wheel with eight arms, all of which are ribbed on both ſides. The pattern is laid upon a board with the face ſhewn in *fig.* 7, upwards; an empty flaſk is laid upſide downwards over the board and pattern; it is filled with ſand and rammed tight; a plain board is then laid upon the flaſk, and two men turn it over, bringing the pattern to the top, as ſhewn in *fig.* 10; the workman with a ſmall trowel, *fig.* 3, then digs all the ſand out of the ſpace A A, *fig.* 10, between each arm, leaving it level with the tops of the ribs, *a b*, *c d*, &c. *fig.* 7; into each of the ſpaces thus formed, a piece of iron plate, *fig.* 8, cut to ſuit the ſame, is laid; it has an iron rod, *a*, projecting from the upper ſide and two points, *b*, *d*, at the under ſide, which are inſerted into the ſand between the arms, ſo that the two edges, *e*, *f*, touch the upper edge of the arms *a*, *b*, of the wheel, *fig.* 7. The ſpaces above theſe plates are then filled with ſand and rammed down level with the reſt of the ſand in the flaſk: burnt ſand is then ſprinkled over the lower flaſk to prevent the ſand which is now to be rammed into the upper flaſk, C D, from adhering to that in the lower; the holes for the metal are next made through the top flaſk, and it is then taken off; the iron plates and the ſand upon them are taken out by the ends of the iron, *a*; the ſand round the pattern is ſlightly wetted, and the cogs of the wheel are taken out one by one (for which purpoſe they are only fixed on by a dovetailed groove cut in the rim, ſee M) and then the whole wheel is lifted out by the ſcrews, *fig.* 5; the iron plates are then put again in the place where they ſtood before, being determined by the holes which the points, *b*, *d*, made in the ſand. The hole H through the wheel, which is to receive the ſhaft, is ſolid in the pattern, and a projection of the ſame ſize as the intended hole is fixed on; this projection forms a receſs, *k*, *fig*. 10, in the ſand, which is to determine the place of the core, M, *fig*. 9, for the hole which is made in a ſeparate pattern of well tempered clay or wet loam and dried. The upper flaſk, C D, is then put on again, and loaded with weights ready for caſting. In caſting large cog-wheels, &c. flaſks are often wanted as large as 20 feet on each ſide; to keep the ſand from falling out, bars of wood are bolted acroſs the flaſk, into which long nails are driven, before it is filled, to keep the ſand together. Theſe large flaſks are lifted by a crane.

III. *Loam-Caſting* is uſed for bulky articles, as cylinders, large pipes, boilers, cauldrons, &c. &c. We will begin by deſcribing the manner of forming the mould for a large cylinder: A, *fig*. 11, is a beam of the building; B B is a ſpindle with three or four holes, *d c*, through it, to fix an iron arm D in, at different heights by a nut; E E is a board, that can be firmly fixed between the bars D and F, by two clamps, G, H: the operation is begun by laying an iron ring L upon the ground, and adjuſting it ſo as to be concentric to the ſpindle B; a cylinder of brickbats and clay or wet loam, inſtead of mortar, is then built upon it, ſome inches leſs in diameter than the intended cylinder, for which this is to form a core; the bricks are ſtrongly bound together with iron hoops, nealed wire, &c. and a fire is then lighted in it. When the loam uſed with the bricks is dry, a coating of loam is ſpread over it, and is ſmoothed by turning the board E E round it. This coat makes it of the proper ſize for the inſide of the cylinder to be caſt, and is called the core of the mould; another cylinder is built, plaiſtered, and ſmoothed in the ſame way, except that no hoops are uſed, whoſe diameter is the ſame as the outſide of the cylinder to be caſt; when it is finiſhed, it is covered with charcoal ground with water like paint, laid on with a bruſh; and a thin coating of loam is laid on; this is bound round with hoops, and to theſe, four hooks are fixed to lift it by; a thick coat of loam and hair is then laid over it. When all theſe are dry, a man gets into the cylinder, and with a ſmall pick pulls down all the bricks in the inſide cylinder, and then with a trowel cuts away all the loam, leaving the inſide of the external cylinder (which is called the mould) quite ſmooth; this is effected by the coat of charcoal, which prevents the two coats of loam from adhering together.

A deep pit is now dug, in ſome convenient part of the foundery, into which the core is let down by a crane; an apparatus, ſhewn in *fig*. 12, is uſed for ſlinging it to the crane, A B D E is a wrought-iron croſs, the arms of which are ſtrengthened by ties going through the ring F, by which it is hooked to the crane-rope or chain; on each of the four croſs-bars, a ring with a hook, *a b d e*, is looſely fitted; to theſe hooks ropes which paſs through the hooks on the mould are faſtened, in the core theſe ropes go round the ſtubbs, *l*, *l*, of the ring L, *fig*. 11. The mould can always be made to hang perpendicularly, by ſliding the hooks, *a*, *b*, *c*, *d*, nearer to or farther from the center of the croſs. When the core is ſet down in the pit, the mould is let down over it by the ſame means, and when they are adjuſted, the ſand is thrown in, and rammed round, about half the height; a flat cover of dried loam is then put on the top of the mould and core, and round pieces of wood are put in the holes which had before been made in the cover for pouring the metal in at. The burying of the mould is then completed: when it is all levelled. The ſticks which keep open the holes for the metal are carefully pulled out, and ſmall ditches made from the furnace to them, ready for caſting.

*Fig*. 13, ſhews the method of making the mould for an air-veſſel (ſee our article PUMP); the core, A, is built of bricks, plaiſtered with loam and turned by the machine, *fig*. 11, as before deſcribed; the edge of the board, E E, being cut to the proper curve; another is then built of the ſame ſize and form as the outſide of the veſſel to be caſt, with a projecting ring or flaunch at the bottom; this, after being turned, is painted with charcoal, and the mould made upon it as in the laſt caſe; it is plain, that from the ſhape of the core the mould cannot be lifted off, nor can a man readily get in, to take out the bricks as in the caſe of a cylinder; the mould muſt therefore be ſawn in half, B G, with a fine ſaw, to get it off; it is then put together again round the core A, and the crack is plaiſtered up with loam. To deſcribe the more complicated caſes of this kind of Caſting, as the nozzles or valve-boxes and pipes of ſteam-engines, &c. &c. would far exceed our limits.

CASTING *of gold*, *ſilver*, or *copper*, in plates. See COINING.

CASTING, in *Joinery*, &c. Wood is ſaid to be *caſt* or warped, when, either by its drought or moiſture, or the drought or moiſture of the air, or other accident, it ſhoots or ſhrinks; in prejudice to its flatneſs or ſtraitneſs.

CASTING *of lead on cloth*, is the uſing of a frame or mould covered with woollen cloth and linen over it, to caſt the lead into very fine ſheets.

CASTING *of lead on ſand*, is done by means of a large frame or trough nearly full of ſand, which is made perfectly level, and imprinted with any device from moulds preſſed down in the ſand: the lead is then turned out of the kettle into a receiver or trough, and poured on the ſand, whilſt two perſons ſlide a gauge or lath, of ſuch thickneſs as to leave a ſpace between it and the ſand anſwering to the ſubſtance of the lead, along the edges of the frame; the ſurplus runs into reſervoirs by channels made in the ſand. See CASTING, in *Foundery*.

The goldſmiths uſe the bone of the CUTTLE-*fiſh*, to mould and caſt their leſſer works of gold and ſilver; that bone, when dried, being reducible to a kind of a fine pumice, very ſuſceptible of all impreſſions.

CASTING *in ſtuc* or *plaiſter*, is the filling with fine liquid plaiſter a mould that had been taken in pieces from off a ſtatue or other piece of ſculpture, and run together again. There are two things to be obſerved with regard to the mould: the firſt, that it be well ſoaked with oil before the plaiſter be run, to prevent its ſticking: the ſecond, that each piece whereof it conſiſts have a packthread, to draw it off the more eaſily when the work is dry. See CAST.

CASTING *of metals*, *of letters*, *bells*, *figures*, &c. See FOUNDERY.

CASTING, in reſpect of *Medals*. See MEDALS.

CASTING, in *Rural Economy*, the operation of throwing a horſe down. It is done as follows: having brought him upon ſome even ground that is ſmooth and ſoft, or into the barn upon ſoft ſtraw, take a long rope, double it, and caſt a knot a yard from the bow; put the bow upon his neck, and the double rope betwixt his fore legs, about his hinder paſterns, and under his fetlocks; when you have done this, ſlip the ends of the rope underneath the bow of his neck, and draw them quick, and they will overthrow him; then make the ends faſt, and hold down his head. This practice is neceſſary upon many occaſions, when operations are to be performed on horſes.

CASTING, in *Seamanſhip*, the motion of a ſhip in falling off, ſo as to bring the direction of the wind on either ſide of the ſhip, after it had blown for ſome time right a-head. This term is particularly applied to a ſhip when her anchor firſt looſens from the ground, when ſhe is about to depart from any place where ſhe had anchored; and as it is probable ſhe had been at anchor with her head to windward, it is evident ſhe muſt turn it off, ſo as to fill the ſails before ſhe can advance in her courſe, which operation is called *caſting*. Hence, ſhe is ſaid to caſt the right way, or the wrong way.

Casting-*net*, a ſort of fiſhing-net, ſo called becauſe it is to be caſt or thrown out, which when exactly done, nothing eſcapes it, but weeds, and every thing within its extent, is brought away.

Casting *a point of traverſe*, among *Seamen*, ſignifies the pricking down on a chart the point of the compaſs any place bears from you; or finding what point of the compaſs the ſhip bears at any inſtant, or what way the ſhip has made.

Casting *of timber-work*. See Casing.

CASTIONE, in *Geography*, a town of Italy, in the duchy of Milan; 8 miles S.W. of Milan.—Alſo, a town of Italy, in the Lodeſan; 9 miles S.E. of Lodi.

CASTLE, *Caſtellum*, in *Ancient Writers*, denotes a town or village ſurrounded with a ditch and wall, furniſhed with towers at intervals, and guarded by a body of troops.

The word is originally Latin, *caſtellum*, a diminutive of *caſtrum*.

*Caſtellum* originally ſeems to have ſignified a ſmaller fort, for a little garriſon. Though Suetonius uſes the word where the fortification was large enough to contain a cohort.

The *caſtella*, according to Vegetius, were often like towns, built in the borders of the empire, and where there were conſtant guards, and fences againſt the enemy.

Horſley takes them for much the ſame with what were otherwiſe denominated ſtations. See Castella.

Castle, or Castle-*ſteed*, is alſo an appellation given by the country people in the north to the Roman *caſtella*, as diſtinguiſhed from the *caſtra ſtativa*, which they uſually call *cheſters*. Horſley repreſents this as an uſeful criterion, whereby to diſcover, or diſtinguiſh, a Roman camp or ſtation.

Castle, in a modern ſenſe, is a place fortified either by nature or art, in a city or country, to keep the people in their duty, or to reſiſt an enemy. In the more extenſive interpretation of the word, it includes the various methods of encampment, ſee (Castrametation;) but in its ſtricter meaning, it is uſually applied to buildings walled with ſtone, and intended for reſidence as well as for defence.

Few branches of hiſtorical reſearch have been ſo little attended to as that which relates to *Military Architecture*. Caſtles, indeed, ſuch as we now ſee them, were of late introduction to the world. Whether we may rank them with the accommodations of life brought by the cruſaders from the Eaſt, is doubtful: but thus much ſeems tolerably certain, that it was in France, England, Germany, Switzerland, and Savoy, that the ſyſtem of caſtellation firſt prevailed. In Italy, till the Normans got poſſeſſion of Naples and Sicily, caſtles were comparatively few. And we may at leaſt date their general adoption in Europe with the feudal ſyſtem.

The early Britiſh fortifications ſeem to have been little more than mere intrenchments of earth. Cæſar, however, penetrated not far enough to know the true nature of the Britiſh fortreſſes; and in his work, "De Bello Gallico," (lib. v. § 17.) has given only the deſcription of a lowland camp. In all parts of England there is a vaſt number of ſtrong intrenchments of a very peculiar kind, ſituated chiefly on the tops of natural hills, and which can be attributed to none of the different people who have ever dwelt in the adjacent country, but the ancient Britons. That they may have been uſed at different times, and occupied upon emergencies by the ſubſequent inhabitants of the iſland, is no more than probable; but there are many, and undoubted reaſons, for deeming them the ſtrong poſts and faſtneſſes of the aboriginal ſettlers, where they lodged their wives, formed their garriſons, and made their ſtand. That the Britons were accuſtomed to fortify ſuch places, we have the authority of Tacitus, who, deſcribing the ſtrong holds formed and reſorted to by Caractacus, ſays, "Tunc montibus arduis, et ſi qua clementer accedi poterant, in modum valli ſaxa præſtruit." (Annal. lib. xii. § 33.) One of theſe intrenchments ſtill makes a formidable appearance on a mountain hanging over the vale of Nannerch, in Flintſhire, called Moel-Arthur. But their ſituation being ſo high that they could have no ſupply of water except from the clouds, they were often liable to be untenable for a conſiderable time together.

One of the moſt important of theſe faſtneſſes in our own country, is the Herefordſhire beacon, ſituated on a ſpot that could not but be an object of the utmoſt attention to the original inhabitants of thoſe territories, which afterwards were deemed diſtinctly England and Wales, from the very diviſion here formed. It is on the ſummit of one of the higheſt of the Malvern hills, and is known by the name juſt mentioned. It has been by turns attributed to the Romans, the Saxons, and the Danes, but its conſtruction as a ſtrong hold ſhews it was deſigned as a ſecurity for the whole adjacent country on any emergency. Another of theſe fortreſſes is at Bruff in Staffordſhire; has been deſcribed by Mr. Pennant; (Journey from Cheſter, p. 47.), and exactly anſwers the account of Tacitus. It is placed on the ſummit of a hill, is ſurrounded by two deep ditches, and has a rampart formed of ſtone. Other inſtances are adduced by Mr. Pennant in his "Tour in Wales," and by Mr. King in the firſt volume of the "Munimenta Antiqua:" but a ſtronger inſtance than all perhaps is given by Mr. Gough in the Additions to Camden, (vol. ii. p. 404.) who ſhews that the true Caer Caradoc, the very fortreſs alluded to in the ſentence we have quoted, which if not the royal ſeat of Caractacus, ſeems to have been at leaſt his ſtrong hold, was in Shropſhire, two miles ſouth of Clun and three from Coxal, being a large camp, three times as long as it is broad, on the point of a hill, acceſſible only one way, and defended on the north ſide by very deep double ditches, in the ſolid rock: whilſt on the eaſt, the ſteepneſs of the ground renders it impregnable. On the ſouth it has only one ditch, for the ſame reaſon: and the principal entrance is on the weſt ſide, fenced with double works; whilſt to the ſouth-weſt it is even fenced with treble works. The moſt extraordinary, however, of all theſe kinds of fortreſſes is ſituated in Caernarvonſhire, called Tre'r Caeri, or the town of fortreſſes. The plan and elevation of this ancient ſtrong hold and abode is given by Mr. Pennant in his "Tour in Wales," (vol. ii. p. 206.) On the acceſſible ſide it was defended by three rude walls of ſtone; the upper ones being lofty, about fifteen feet high, and ſixteen broad; exhibiting a grand and extenſive front. The ſpace on the top is an irregular area; but the whole is filled with cells; ſome round, and ſome oval, and ſome alſo oblong or ſquare. Several of the round ones were fifteen feet in diameter; which brings to mind the houſes of the ancient Gauls deſcribed by Strabo; and of thoſe that were oblong, there was at leaſt one even thirty feet in length. Of the ſame kind of fortreſſes were Penmaen Mawr, in Caernarvonſhire, Warton Cragg, in Lancaſhire, Old Oſweſtry, in Shropſhire; the irregular encampment of Maiden Caſtle nigh Dorcheſter; and probably Old Sarum, whoſe character was new modelled by the Romans. Mr. King, (Munimenta Antiqua, vol. i. p. 63.), conſiders the

the dens in the mountains, and the thickets of Scripture, as ſtrong holds or hill-fortreſſes of the kind deſcribed. When Samſon had made a great ſlaughter of the Philiſtines, we are told he went and dwelt in the top of the rock Elam; where we find, afterwards, three thouſand men of Judah went up to confer with him. That hill-fortreſſes were uſed in the earlieſt ages there can be little doubt. The Iſraelites, when their land was invaded by Jabin, the king of Canaan, in conſequence of an exhortation from Deborah the propheteſs, aſſembled to make their ſtand upon mount Tabor. Among the Indians of South America, ſtrong holds of a ſimilar nature to thoſe of Britain have been frequently diſcovered. (Ulloa. Voyage to South America, i. 503, 504.) And a very curious inſtance of the attack and ſurrender of one in Sogdiana, in Aſia, in the time of Alexander the Great, is related by Quintus Curtius, (lib. vii. chap. xi.) The anecdote is worth the reference of the reader.

The Britiſh mode of warfare appears to have received but little alteration from the introduction of Roman tactics. Till finally ſubdued, their princes ſhowed abilities both in the command of armies and in the conduct of a war; they choſe their ground judiciouſly; formed able plans of active operation; and availed themſelves of all the advantages of local knowledge: but to the fortreſſes deſcribed, if we may rely on the teſtimonies of our ancient writers, they did not very frequently retire. Their deficiencies both in the attack, the conſtruction, and the defence of ſuch places, muſt have been very obvious even to themſelves; and as they delighted to live, ſo they uſually choſe to fight in open plains. Their impatient courage, and their averſion from labour, made them unable to endure the delays and fatigues of defending or beſieging the caſtles of their time; and they often reproached the Romans with cowardice for raiſing ſuch ſolid works about their camps and ſtations. (See Boadicea's famous ſpeech to her army in Xiphilin, ex Dione in Nerone.)

Of the Roman military works in this country, they were for the greater part temporary; many, however, were ſtationary poſts; and ſome few, to the retention of which the greateſt importance was attached, became walled *caſtra*.

Cæſar, in the work already quoted, (De Bell. Gall. l. vii.), deſcribes one of his camps as fortified very much in the manner of a walled city. A few of the Roman ſtations in our own country aſſiſt in throwing light on the deſcription; and, in ſhort, ſuch as were ſo ſurrounded, appear to have been the link of connection between the Britiſh earth-work and the feudal caſtle.

Richborough, Portcheſter, and Pevenſey, are the three greateſt fortreſſes the Romans have left us.

Richborough, the very earlieſt in order of time, is ſuppoſed to have been begun in the year 43, in the reign of Claudius: but not to have been completed till 205, under the direction of the emperor Severus. There are in this diſtinguiſhed fortreſs, ſays Mr. King (Munimenta Antiqua, ii. 8.) ſtill plainly to be traced all the principal parts of one of the very greateſt and moſt perfect of the ſtationary camps. The upper diviſion for the general and chief officers; and the lower diviſion for the legion. In the former the Prætorium with its parade; and the Sacellum or ſmall temple for depoſiting the enſigns. In the walls too are the traces of the four great gates; the decuman, the prætorian, and the two poſterns. The great courſes of ſtone, with which the wall is formed, are ſeparated from each other by alternate layers, compoſed entirely of a double courſe of bricks each; as in the walls of Verulam, Silcheſter, and other of our Roman towns.

The Roman remains at Portcheſter are not perhaps ſo clearly to be traced; ſince, having been conſtantly uſed as a fortreſs in ſucceeding ages, it has received vaſt and extremely various additions: and preſents us with ſpecimens of military architecture in almoſt every period from the Normans to the time of queen Elizabeth.

Similar alterations, to thoſe firſt mentioned, have given ſo ſtrong a turn to the general character of Pevenſey, that its real æra has been ſometimes doubted; though portions of the Roman wall, as well as the Decuman gate, may be eaſily and accurately traced.

Here too it may not be irrelevant to obſerve that the caſtle at Colcheſter, in Eſſex, has been ſometimes taken for a Roman fortreſs. And this not only becauſe it has many of the ſame ſort of tiles which are found in Roman walls, but becauſe they are laid in the ſame manner, with bands. Though if the building is examined with attention, there may be traced in almoſt every part evident marks either of the later Saxon or Norman workmanſhip: and though many of the tiles which are uſed in it may have been gathered from the remains of Roman buildings, the greater part appears to have been made on purpoſe. (See the Archæologia, vol. iv. p. 33.)

That in the Roman times, however, there muſt have been many other ſuch walled ſtations as thoſe at Richborough, Portcheſter, and Pevenſey, there can be little doubt. The Saxons, in the courſe of their long wars with the Britons, may be fairly ſuppoſed to have deſtroyed many of the fortifications which had been thus erected: and after their final ſettlement they neglected to repair thoſe which remained, or to build many of their own. By theſe means the country became open and defenceleſs; which greatly facilitated the incurſions of the Danes, who met with little obſtruction from fortified places. That there was, however, ſomething like a caſtle at Bamborough in Northumberland, we have the concurrent teſtimony of hiſtorians (Matth. of Weſtminſter, p. 193. ſub ann. 547. Sax. Chronicle, p. 19. Roger. Hoved. p. 238. b. Bede l. iii. c. vi. 12.): a caſtle at Corffe, in Dorſetſhire, is ſaid to have exiſted in the days of Edgar (Gough's Add. to Camden, i. 49. King's Munimenta Antiqua, iii. 209.) Portcheſter caſtle during this period, probably, retained its deſignation. And Mr. King (Munim. Antiq. iii. 211.) has taken conſiderable pains to prove that the fortreſs at Caſtleton in Derbyſhire is of as high antiquity.

Alfred the Great, however, ſeems to have been the firſt of our princes with whom the building of caſtles became an object of national policy. Though, if Aſſer's authority may be received, they were not exactly what the reader at the firſt mention of their name might take them for; ſince they were compoſed not only of ſtone but of *wood.* (Aſſer de Reb. geſtis Alfredi, p. 17, 18.) Elfleda, too, his daughter, governeſs of Mercia, who ſeems to have been the only perſon in the kingdom who properly complied with the commands, and imitated the example of her illuſtrious father, and who inherited more of the wiſdom and ſpirit of Alfred than any of his children, not only followed his ſteps by fighting many battles with the Danes, but built no leſs than eight caſtles, in the ſpace of three years, to check their incurſions. (Hen. Hunt. Hiſt. p. 204.) A ſtill more remarkable inſtance of the knowledge of caſtle-building at a ſhort period ſubſequent to this, may be found in William of Malmeſbury (c. vi.) When he mentions the rebuilding of Exeter by Athelſtan, who died in 941, "Urbem igitur illam," ſays the hiſtorian, "quam contaminatæ gentis repurgio defæcaverat, *turribus munivit*, muro ex quadratis lapidibus cinxit." And from the few remains of the fortifications of this period we find that the walls preciſely anſwer Malmeſbury's deſcription. They were faced with theſe four-ſquare ſtones both within and without, and the intermediate ſpace, between the facings, was filled up with rubble or rough flint ſtones mixed together with a ſtrong and permanent cement. It is to this period too that the moſt judicious of our writers have referred the caſtle at Colcheſter which has been already mentioned. Its form is four-ſquare, flanked at the four corners with ſtrong towers, and it is about two hundred and twenty-four yards in circumference on the outſide, all projections and windings included; the four ſides nearly facing the four cardinal points. Some have even gone ſo far as to call this venerable ruin Britiſh; others, as we have already ſaid, have attributed it with a greater ſhare of plauſibility to the Romans; but Camden and our better writers aſcribe it to Edward the elder, who repaired the walls and re-edified the town in the beginning of the 10th century.

Still, however, the paucity of ſtrong poſts in the iſland during every period of the Anglo-Saxon hiſtory may be conſtantly obſerved. And it is more than probable that to this defect we may attribute the defeat of Harold; ſince it became neceſſary that all ſhould be riſked upon the iſſue of a ſingle battle. The conqueror, himſelf, was evidently ſenſible that the want of fortified places in England had greatly facilitated his conqueſt, and might, at any time, alſo, facilitate his expulſion. He therefore made all poſſible haſte to remedy the defect, by building magnificent and ſtrong caſtles in all the towns within the royal demeſnes. "William," ſays Matthew Paris, "excelled all his predeceſſors in building caſtles, and greatly haraſſed his ſubjects and vaſſals with theſe works." (Matthew Paris, Hiſt. p. 8. col. 2.) All his earls, barons, and even prelates, imitated his example; and it was the firſt care of every one who received the grant of an eſtate from the crown, to build a caſtle upon it for his defence and reſidence. The diſputes about the ſucceſſion, in the following reigns, kept up this ſpirit for building great and ſtrong caſtles. William Rufus was ſtill a greater builder than his father; and Henry I. was not idle in adding to their number. "William Rufus," ſays Henry Knyghton (col. 2373.) "was much addicted to building royal caſtles and palaces, as the caſtles of Dover, Windſor, Norwich, Exeter, the palace of Weſtminſter, and many others, teſtify; nor was there any king of England before him that erected ſo many, and ſuch noble edifices." Though of one or two of theſe William Rufus was only the improver. But the rage for building caſtles never prevailed ſo much in any period of the Engliſh hiſtory as in the turbulent reign of Stephen, between 1135 and 1154. In this reign, ſays the writer of the Saxon chronicle (Chron. Sax. p. 238.), every one who was able, built a caſtle; ſo that the poor people were worn out with the toil of theſe buildings, and the whole kingdom was covered with caſtles. And this laſt expreſſion will hardly appear too ſtrong, when we are informed, that beſides all the caſtles before that time in England, no fewer than eleven hundred and fifteen were raiſed from the foundation in the ſhort ſpace of nineteen years. (Rad. de Diceto, col. 528.) Stephen, ſays Holinſhed (vol. iii. fol. 50.) "began to repent himſelf, although too late, for that he had granted licence to ſo many of his ſubjects to build caſtles within their own grounds."

An art, Dr. Henry obſerves, (Hiſtory of Britain, vol. vi. p. 188 8vo.) ſo much practiſed as architecture was in this period, muſt have been much improved. That it really was ſo, will appear from the following very brief deſcription of the moſt common form and ſtructure of a royal caſtle, or of that of a great earl, baron, or prelate in this period; and as theſe caſtles ſerved both for reſidence and defence, this deſcription will ſerve both for an account of the domeſtic and military architecture of thoſe times, which cannot well be ſeparated.

The ſituation of the caſtles of the Anglo-Norman kings and barons was moſt commonly on an eminence, and near a river; a ſituation on ſeveral accounts eligible. The whole ſite of the caſtle (which was frequently of great extent and irregular figure) was ſurrounded by a deep and broad ditch, ſometimes filled with water, and ſometimes dry, called the *foſſe*. Before the great gate was an outwork, called a *barbacan*, or *antemural*, which was a ſtrong and high wall, with turrets upon it, deſigned for the defence of the gate and drawbridge. On the inſide of the ditch ſtood the wall of the caſtle, about eight or ten feet thick, and between twenty and thirty feet high, with a parapet, and a kind of embraſures, called *crennels*, on the top. On this wall at proper diſtances, ſquare towers of two or three ſtories high were built, which ſerved for lodging ſome of the principal officers of the proprietor of the caſtle, and for other purpoſes; and on the inſide were erected lodgings for the common ſervants or retainers, granaries, ſtore-houſes, and other neceſſary offices. On the top of this wall, and on the flat roofs of theſe buildings, ſtood the defenders of the caſtle, when it was beſieged, and from thence diſcharged arrows, darts, and ſtones, on the beſiegers. The great gate of the caſtle ſtood in the courſe of this wall, and was ſtrongly fortified with a tower on each ſide, and rooms over the paſſage, which was cloſed with thick folding-doors of oak, often plated with iron, and with an iron portcullis or grate let down from above. Within this outward wall was a large open ſpace or court, called, in the largeſt and moſt perfect caſtles, the *outer bayle*, or *ballium*, in which ſtood commonly a church or chapel. On the inſide of this outer bayle was another ditch, wall, gate, and towers, incloſing the inner bayle or court, within which the chief tower or *keep* was built. This was a very large ſquare fabric, four or five ſtories high, having ſmall windows in prodigious thick walls, which rendered the apartments within it dark and gloomy. This great tower was the palace of the prince, prelate or baron, to whom the caſtle belonged, and the reſidence of the conſtable or governor. Under ground were diſmal dark vaults, for the confinement of priſoners, which made it ſometimes be called *the dungeon*. In this building alſo was the great hall, in which the owner diſplayed his hoſpitality, by entertaining his numerous friends and followers. At one end of the great halls of caſtles, palaces and monaſteries, there was a place raiſed a little above the reſt of the floor called the *deis*, where the chief table ſtood, at which perſons of the higheſt rank dined. Though there were unqueſtionably great variations in the ſtructure of caſtles and palaces in this period, yet the moſt perfect and magnificent of them ſeem to have been conſtructed on the above plan. Such, to give one example, was the famous caſtle of Bedford, as appears from the following account of the manner in which it was taken by Henry III., A. D. 1224, from Matthew Paris. (Hiſt. Angl. p. 221, 222.) The caſtle was taken by four aſſaults. "In the firſt, was taken the barbacan; in the ſecond, the outer ballia; at the third attack, the wall by the old tower was thrown down by the miners, where, with great danger, they poſſeſſed themſelves of the inner ballia, through a chink; at the fourth aſſault, the miners ſet fire to the tower, ſo that the ſmoke burſt out, and the tower itſelf was cloven to that degree, as to ſhew viſibly ſome broad chinks; whereupon the enemy ſurrendered."

As Britain abounded in this period in fortified towns and caſtles, much of the art of war of courſe conſiſted in defending and aſſaulting ſtrong places. For the various kinds of engines which were uſed both in the attack and the defence of theſe, we ſhall refer the reader to ARTILLERY; obſerving only that a knowledge of the application of them in this period may be obtained from the relation of the ſiege of

Exeter caſtle by king Stephen in the year 1136. (See the Geſta Regis Stephani apud Ducheſn, p. 934.) It is perhaps the moſt conſummate ſpecimen of the military ſkill of that age with which we are acquainted. And it may be enough to obſerve, that after this ſiege had laſted three months, and king Stephen had expended upon it in machines, arms, and other things, no leſs than 15,000 marks, equal in efficacy to 150,000 pounds of our money, the beſieged were obliged to ſurrender for want of water. (Henry's Hiſt. of Britain, vol. vi. p. 217.

Berkeley, which was originally founded in the reign of Stephen, is one of the beſt remains we are now poſſeſſed of, of an ancient feudal caſtle. But the changes which almoſt all theſe buildings have undergone in ſubſequent times may be judged of by thoſe which have taken place at Berkeley. The buildings within the inmoſt only of the three gates are ſaid to have been the work of Henry II. when duke of Normandy; while the two outermoſt, with all the buildings belonging to them, except the keep, are referred to the latter end of the reign of Henry II. and to thoſe of the ſecond and third Edwards. The hall and the two chapels are of the latter period; and the great kitchen, adjoining to the keep, was of the work of Henry VII.

Among the caſtles which Mr. King has endeavoured to appropriate to the early Norman period, are thoſe of Nottingham, Lincoln, and Clifford's tower at York, all erected by the Conqueror. (Archæol. vol. vi. p. 257.) The remains of all theſe, he obſerves, fully illuſtrate the Norman mode of conſtructing ſuch edifices. Tick-hill, in the neighbourhood of Doncaſter, appears to have been another of theſe caſtles (ibid. 267.); and Pontefract beſpeaks a Norman deſign, with rude and imperfect alterations. All of theſe appear to have been erected upon artificial mounts, and nearly cover the whole area of the ſummit of the reſpective hills on which they are ſituated.

Tunbridge caſtle, in Kent, built by Richard de Clare about the time of William Rufus, is mentioned by Mr. King as a ſpecimen of the later Norman ſtructures; and he has been very accurate in his deſcription of it. (Ibid. 270.) Gundulph, who directed the building of the Tower of London in 1078, and the caſtle at Rocheſter, he deſcribes to have introduced a great many judicious alterations, and not only to have increaſed the ſecurity but the magnificence of our military piles; and obſerves that the caſtle at Rocheſter is a complete ſpecimen of all that he effected. Newark, which Mr. King afterwards mentions, is an inſtance of a prelate's caſtle in the reign of Stephen: and the keep of Knareſborough, of the time of Henry III., completes the ſpecimens it may be proper to mention of the irregular ſtyle of caſtle building which prevailed during the interval between the Norman conqueſt and the middle of the thirteenth century.

To theſe ſucceeded the magnificent piles of Edward I. more convenient and more ſtately, and containing not only many towers, but great halls, and ſometimes even religious houſes. The beſt ſtyle of military architecture in this period was diſplayed in the caſtles of Caernarvon, Conway, and Caerphilly; and it is ſingular to obſerve that many of our more ancient caſtles were then increaſed with additions in the ſame ſumptuous ſtyle.

After the age of Edward I. we find another kind of caſtle introduced, approaching nearer to the idea of modern palaces. The firſt of theſe was that at Windſor, built by Edward III. who employed William of Wykeham as his architect. This convenient and enlarged ſtyle of building was ſoon imitated, on a leſſer ſcale, by the nobles of the realm; and two remarkable inſtances, wherein convenience and magnificence were ſingularly blended at this period, may be found in the caſtles of Harewood and Spofford in Yorkſhire. The improvements at Kenilworth afford another inſtance of the great enlargement which our caſtles during this age were accuſtomed to receive: and Naworth in Cumberland is another of the beſt ſpecimens that can probably be referred to. Caiſtor in Norfolk affords the ſtyle of Henry VIth's reign. It was built by ſir John Faſtolf, who died in 1459.

To theſe venerable piles ſucceeded the caſtellated houſes; manſions adorned with turrets, and battlements; but utterly incapable of defence, except againſt a rude mob, armed with clubs and ſtaves, on whom the gates might be ſhut; yet ſtill manſions almoſt quite devoid of all real elegance, or comfortable convenience, and fitted only to entertain *a herd of retainers* wallowing in licentiouſneſs. At the ſame time, however, they diſcover marks of economy and good management, which enabled their hoſpitable lords to ſupport ſuch rude revels, and to keep up their ſtate, even better than many of their more refined ſucceſſors. Of theſe buildings one of the moſt perfect and moſt curious, now remaining, is Haddon houſe in Derbyſhire; caſtellated and embattled, in all the apparent forms of regular defence; but really without the leaſt means of reſiſtance in its original conſtruction. The deſcription Mr. King has given of it (Archæol. vi. 347.) is, however, too long to be extracted, and too curious to be abridged.

After this kind of building, the magnificent quadrangular houſes of the reign of Henry VIII. ſucceeded; of which the moſt beautiful and genuine models perhaps were thoſe of Cowdray in Suſſex, and Penſhurſt the ſeat of the Sidney family, in Kent.

Without referring to the ſtately buildings of Elizabeth's reign, it may be enough to ſay that here ends the hiſtory of the Engliſh caſtle. The block houſes of Calſhot, Hurſt, Sandrown, Sandgate, and South Sea, are the laſt inſtances of ſuch buildings ever intended for a ſtand, and ſeem ſtrongly to mark the revolution which has taken place in our defenſive ſyſtem of war.

The total change in military tactics brought about by the invention of gunpowder and artillery, the more ſettled ſtate of the nation, Scotland becoming part of the dominions of the kings of England, the reſpectable footing of our navy, whoſe wooden walls ſecure us from invaſions, and the abolition of the feudal ſyſtem, all conſpired to render caſtles of little uſe or conſequence, as fortreſſes: ſo the great improvements in arts and ſciences, and their conſtant attendant, the increaſe of luxury, made our nobility and gentry build themſelves more pleaſant and airy dwellings; relinquiſhing the ancient dreary manſions of their forefathers, where the enjoyment of light and air was ſacrificed to the conſideration of ſtrength; and whoſe beſt rooms, according to our modern, refined notions, have more the appearance of gaols and dungeons for priſoners, than apartments for the reception of a rich and powerful baron.

However, in the reign of Charles I., a little before the breaking out of the civil war, ſome inquiry into the ſtate of theſe buildings ſeems to have taken place; for on the 22d of January, 1636, a commiſſion was iſſued, appointing lieutenant colonel Francis Coningſby, commiſſary general of and for all the caſtles and fortifications in England and Wales, with an allowance of 13s. 4d. a day to be paid out of the cheques and defalcations that ſhould be made by him from time to time; or, in default thereof, out of the Treaſury. Whether this office was really inſtituted for the purpoſe of ſcrutinizing into the ſtate of theſe fortreſſes, as foreſeeing the events which afterwards happened; or whether it was only formed to gratify ſome favourite, does not appear. During the troubles of that reign, ſome ancient caſtles were garriſoned and defended, ſeveral of which, particularly Corfe caſtle in Dorſetſhire, were afterwards deſtroyed, by order of the parliament: ſince that period, they have been abandoned to the mercy of time, weather, and the more unſparing hands of avaricious men. The laſt have proved the moſt deſtructive; many of theſe monuments of ancient magnificence having been by them demoliſhed for the ſake of the materials: by which the country has been deprived of thoſe remains of antiquity ſo eſſential, in the eyes of foreigners, to the dignity of a nation; and which, if rightly conſidered, tended to inſpire the beholder with a love for the now happy eſtabliſhment; by leading him to compare the preſent with thoſe times when ſuch buildings were erected:—times when this unhappy kingdom was diſtracted by inteſtine wars; when the ſon was armed againſt the father, and brother ſlaughtered brother; when the lives, honour, and property of the wretched inhabitants depended on the nod of an arbitrary king, or were ſubject to the more tyrannical and capricious wills of lawleſs and foreign barons.

The few caſtles exiſting in the Saxon time, were, probably, on occaſion of war, or invaſions, garriſoned by the national militia, and at other times ſlightly guarded by the domeſtics of the princes or great perſonages who reſided in them; but after the conqueſt, when all the eſtates were converted into baronies, held by knights ſervice, Caſtle-guard, coming under that denomination, was among the duties to which particular tenants were liable. From theſe ſervices the biſhops and abbots, who till the time of the Normans had held their lands in frank almoign, or free alms, were, by this new regulation, not exempted; they were not indeed, like the laity, obliged to perſonal ſervice, it being ſufficient that they provided fit and able perſons to officiate in their ſtead. This was, however, at firſt vigorouſly oppoſed by Anſelm, archbiſhop of Canterbury; who, being obliged to find ſome knights to attend king William Rufus in his wars in Wales, complained of it as an innovation and infringement of the rights and immunities of the church.

It was no uncommon thing for the Conqueror, and the kings of thoſe days, to grant eſtates to men of approved fidelity and valour, on condition that they ſhould perform Caſtle-guard, with a certain number of men, for ſome ſpecified time; and ſometimes they were likewiſe bound by their tenures to keep in repair ſome tower or bulwark, as was the caſe at Dover caſtle.

In proceſs of time theſe ſervices were commuted for annual rents, ſometimes ſtyled ward-penny, and wayt-fee, but commonly caſtle-guard-rents; payable on fixed days, under prodigious penalties called ſur-ſizes. At Rocheſter, if a man failed in the payment of his rent of caſtle-guard, on the feaſt of St. Andrew, his debt was doubled every tide, during the time for which the payment was delayed. Theſe were afterwards reſtrained by an act of parliament made in the reign of king Henry VIII., and finally annihilated with the tenures by knights' ſervice, in the time of Charles II. Such caſtles as were private property, were guarded either by mercenary ſoldiers, or the tenants of the lord or owner.

Caſtles which belonged to the crown, or fell to it either by forfeiture or eſcheat, (circumſtances that frequently happened in the diſtracted reigns of the feudal times), were generally committed to the cuſtody of ſome truſty perſon, who ſeems to have been indifferently ſtyled governor or conſtable. Sometimes alſo they were put into the poſſeſſion of the ſheriff of the county, who often converted them into priſons. That officer was then accountable to the exchequer, for the farm or produce of the lands belonging to the places entruſted to his care, as well as all other profits: he was likewiſe, in caſe of war or invaſion, obliged to victual and furniſh them with munition out of the iſſues of his county; to which he was directed by writ of privy ſeal Variety of theſe writs, temp. Edw. III. may be ſeen in Madox's Hiſtory of the exchequer; and it appears from the ſame authority, that the barons of the exchequer were ſometimes appointed to ſurvey theſe caſtles, and the ſtate of the buildings and works carrying on therein. (See Groſe's Preface to the Antiquities of England and Wales.)

Castle, in *Sea Language*, denotes an elevation on the deck of a veſſel; or a part of the deck, fore and aft, raiſed above the reſt.

Castle, *Fore*, *Caſtello di prora*, &c. See Fore-*caſtle*.

Castle, *Hind*, *Caſtello di poppa*. See Poop.

Castle-*Ward*, or Castle-*Guard*, *Caſtelgardum*, or *Wardum Caſtri*, an impoſition laid on ſuch as dwell within a certain compaſs about any caſtle, towards the maintenance of thoſe who watch and ward the *caſtle*, which ſee.

The word is ſometimes alſo uſed for the circuit itſelf, inhabited by ſuch as are ſubject to this ſervice.

Castle, *Water*, a piece of hydraulic work finiſhed with one or more fronts of building, with ſeeming windows and the like, containing a reſervoir which gives play to caſcades, &c. Or, a *water-caſtle* may be defined a receptacle of the public water furniſhed by an aqueduct, or otherwiſe, in which are incloſed the cocks of ſeveral water-pipes with a little baſon; contrived to diſtribute and ſend it to different parts.

The *caſtella* of the ancient aqueducts are ſtill viſible at Rome, though half ruined. They are lined with a durable kind of cement, which, according to Pliny, ſurpaſſes in hardneſs the ſtones themſelves. It is made of lime ſlacked in wine, and beaten up with hog's greaſe, and the juice of figs or pitch.

Modern writers on hydraulics treat of the laws of the efflux of water out of *caſtella* into pipes, canals, &c. Signior Poleni has a treatiſe expreſs on caſtles, or reſervoirs, whereby the waters of rivers are derived, the ſides of which caſtles are made converging.

CASTLEBAR, in *Geography*, a market and poſt town of the county of Mayo, Ireland, which is alſo the ſhire town, and the moſt conſiderable in the county, having been much enlarged within a few years, in conſequence of the judicious encouragement given by the proprietor, lord Lucan, to the linen manufacture and other trades. Agriculture alſo has improved in the neighbourhood. This town is ſituated on the river which runs from the lake of Caſtlebar, weſt of the town, to Lough Conn. In theſe and the other lakes of the neighbourhood, beſides ſalmon and other fiſh, is found that kind of trout called the gillaroo, of which there is an account in the Philoſophical Tranſactions, vol. lxiv. p. 116. 310. It is remarkable for a great thickneſs of ſtomach, which bears ſome reſemblance to the gizzard of birds, and which is brought to table as a delicacy, under the name of gizzard. Mr. Pennant (Brit. Zoology, vol. iii.) does not think it a diſtinct ſpecies, but a variety occaſioned by the nature of the waters, or of the food. Caſtlebar is a corporate town, which, before the union, ſent two members to the houſe of commons, but has now loſt that privilege. It has a barrack, and in the rebellion was a military ſtation. When the French, under general Humbert landed at Killalla, in 1798, they ſurprized the troops at Caſtlebar, and taking poſſeſſion of the town, held it for nine days, when they directed their courſe towards Sligo. Diſtance from Dublin 114 miles weſt by north. N. lat. 53° 50′. W. long. 9° 9′. Statiſtical account of Mayo, &c.

CASTLE-BAY, or Kisimul-bay, a bay at the ſouth end of the iſland of Barray. See Barra.

CASTLE-BELLINGHAM, a ſmall poſt town of the county of Louth, Ireland, on the north road, near the ſea. It is well built, and pleaſantly ſituated, and has a remarkably fine ſpreading elm, ſuppoſed to be the largeſt in the iſland. Here is an extenſive brewery for ale and porter, the former of which has been for many years in high eſtimation. There are alſo a Daniſh fort on the ſea coaſt near this town, and ſome other remains of antiquity in the neighbourhood, deſcribed in the Louthiana. Caſtle-Bellingham is 34 miles north from Dublin. N. lat. 53° 53′. W. long. 6° 23′.

CASTLE-BLAKENEY, a ſmall poſt town of the county of Galway, Ireland, 80 Iriſh miles W. from Dublin. N. lat. 53° 24′. W. long. 8° 22′.

CASTLE-BLAYNEY, a poſt town of the county of Monaghan, Ireland, ſituated near Lough Barrac, a fine lake with many agreeable iſlands in it, on the borders of which is the ſeat of lord Blayney. Poſition N.W. from Dublin. N. lat. 54° 6′. W. long. 6° 44′.

CASTLE-CARY, anciently Cari, in *Geography*, a market town of Somerſetſhire, England, is ſituated three miles W. from Bruton, 12 S.E. from Wells, and 114 W. from London. The town conſiſts principally of three ſtreets, one of which is nearly a mile in length, but is thinly and irregularly built; the pariſh alſo embraces three contiguous hamlets; the houſes of the whole amounted, in 1801, to 240, and the inhabitants to 1281. This town has a charter for holding a market on Tueſdays, but it has been long diſcontinued, except that markets for corn, ſheep, and cattle, are occaſionally held from All-hallow-tide to Eaſter. It has three annual fairs. The old market-houſe (erected in 1616), is now converted into dwelling houſes. The church of Caſtle-Cary was anciently appropriated to the priory of Bath, and in 1292 was valued at twenty marks. A caſtle was erected here in the time of king Stephen, 1138, by William de Percheval, who, poſſeſſing this barony, exerted his power to haraſs that monarch. About this time Stephen was employed in beſieging the city of Briſtol, and Percheval availed himſelf of this event to diſtreſs his ſovereign, by ravaging, from his caſtle at Cary, the adjacent country, and carrying away all proviſions neceſſary for the ſupport of the king's army. The king, finding Briſtol impregnable, and conceiving it unſafe to continue longer before its fortreſs, raiſed the ſiege, and turned all his attention to the caſtle of Cary, from which he had been frequently annoyed. Here his arms were crowned with greater ſucceſs; he battered the fortreſs with ſuch rapidity and violence, that the garriſon, reduced to the utmoſt extremity, receiving no reinforcement nor ſupplies from the earl of Anjou, or their allies in Briſtol, ſurrendered at length upon terms of peace and allegiance. Subſequent to this, in 1153, we find Percheval again in arms in the ſame cauſe, when he defended this caſtle againſt Henry de Tracey, a firm adherent to the royal intereſt, who cloſely beſieged him here, but was obliged to fly before the earl of Glouceſter, who with ſome difficulty diſmantled Tracey's fortifications. (See the Engliſh Chronicles). The caſtle appears to be wholly obliterated, and its ſite only known by an intrenched area of about two acres, called the camp, in which implements of war and bolts of iron have frequently been dug up. The manor and principal property of the town, after paſſing through various hands, now belongs to ſir Richard Colt Hoare, Bart. of Wilts. "Collinſon's Hiſtory of Somerſetſhire," vol. ii. 4to.

CASTLE-COMER, a poſt town of the county of Kilkenny, Ireland, remarkable for its mines of what is uſually called Kilkenny coal. Boate in his Natural Hiſtory of Ireland, publiſhed about 1650, gives an account of the firſt diſcovery, when ſpeaking of the probability that if diligent ſearch were made for them, good coal mines would be diſcovered. "Already," ſays he, "one coal mine hath been found out in Ireland a few years ſince by mere hazard, and without having been ſought for. In an iron mine of Mr. Chriſtopher Wandſworth, after that for a great while they had drawn iron out of it, and that by degrees they were gone deeper, at laſt in lieu of ore they met with ſea-coal, ſo as ever ſince all the people dwelling in thoſe parts have uſed it for their firing, finding it very cheap." Mr. Wandſworth, or more properly ſir Chriſtopher Wandeſford, who was maſter of the rolls, and afterwards deputy to lord Strafford, as lord lieutenant of Ireland, purchaſed the tract in which the collieries are ſituated; and it was erected by Charles I. into the lordſhip of Caſtle-Comer, containing above 12,400 acres. By the marriage of the late lord Ormond with the heireſs of the Wandeſford family, this lordſhip now belongs to a younger branch of the houſe of Ormond. The profits of working have ſometimes been ſix or ſeven thouſand pounds, but from various circumſtances they have decreaſed. The number of pits at work together in 1800 was 16, which is about the average number: for many years have elapſed ſince 24 were at work, and the ſmalleſt number that has been known is twelve. From a pit there is uſually raiſed from 20 to 30 barrels a day of coal, independent of culm. If a navigation exiſted from Caſtle-comer to Kilkenny, and to the Dublin canal, the uſe of the coal would be more extenſive, on account of its greater cheapneſs, the carriage at preſent making the price very high. Near Caſtle-Comer there are alſo iron mines, and good materials for earthen ware. The town has 211 houſes, many of them good and ſlated, and in 1800, 50 of them paid hearth money, from which cabins are exempt. Part of the town was burned during the rebellion of 1798, and has been rebuilt in a handſome manner. It is well ſituated for many manufactures, and the counteſs of Ormond, who reſides there, gives every encouragement to ſettlers. Many particulars reſpecting the mines, price of labour, &c. may be found in Mr. Tighe's valuable and intereſting account of Kilkenny. For an analyſis of the coal, &c. ſee Kilkenny *Coal.* Caſtle-Comer is 45 Iriſh miles S.W. from Dublin, and 10 N. from Kilkenny. N. lat. 52° 47′. W. long. 7° 13′.

CASTLE-CONNELL, a ſmall town of the county of Limerick, Ireland, on the eaſt ſide of the river Shannon, remarkable for a chalybeate ſpa, which cauſes it to be much frequented in the ſummer ſeaſon. The houſes are chiefly ſmall detached dwellings, now become numerous; but there are many fine ſeats in the neighbourhood. The ſurrounding ſcenery is very beautiful, and induces the viſitors to make frequent excurſions, which cannot fail of contributing to the improvement of their health. The ruins of the caſtle, which belonged to the family of Bourk, or de Burgho, are near the ſpa. This caſtle was built ſoon after the arrival of the Engliſh, and was deemed very ſtrong ſo late as 1690, when it was blown up by order of the prince of Heſſe, who commanded at Limerick. Caſtle-Connell is 6 miles north from Limerick, and 89 S.W. from Dublin. Ferrar's Limerick, &c.

CASTLE-DERMOT, a fair and poſt town of the county of Kildare, Ireland. St. Diermit is ſaid to have founded a priory here in A.D. 500, from which it got part of its name. During many centuries it was called Triſtle-Dermot, for what reaſon is not known; but of later years it has been called Caſtle-Dermot, from a caſtle belonging to the Fitzgeralds, of which there is not a trace remaining. It was plundered by the Danes in the 9th century, taken and ſacked by Edward Bruce in 1316, and taken by col. Reynolds for Cromwell in 1650. Since which times its walls have mouldered to decay; but though the gates have been deſtroyed, the names of two of them are ſtill preſerved. The town is ſituated on a flat, and ſurrounded with a fine level country for ſeveral miles. Of the ruins, the old church, in part of which ſervice is ſtill performed, with the round tower adjoining, and two croſſes, are ſuppoſed to be of the 10th century. The round tower is uſed as a belfrey, which ſeems to countenance the opinion, that this was their original deſtination. The remains of a Franciſcan abbey, founded by one of the Fitzgeralds about the year 1300, ſhow it to have been magnificent; particularly one of its windows, two of the ailes, and ſome of the octagon pillars, which ſtill preſerve the outlines of ancient grandeur and elegance. A parliament is ſaid to have been held here in 1377; certainly there was ſuch an aſſembly under the earl of Kildare, lord deputy in Auguſt 1499, when a tax was laid on, and ſome regulations adopted, which however did not probably extend beyond the Engliſh pale. The preſent inn is generally underſtood to be a part of the building in which the parliament was held. The firſt charter ſchool eſtabliſhed in Ireland was in this town, A.D. 1734, for forty boys. See Charter *Schools*. The number of houſes in 1793 was 163, of which 63 were of lime and ſtone, and the reſt cabins. There is no manufacture, but ſome little buſineſs is occaſioned by the great poſt road from Dublin to Cork paſſing through it. It is 34 Iriſh miles S.W. from Dublin. N. lat. 52° 54′. W. long. 6° 52′. Philoſ. Survey of South of Ireland, Antholog. Hibern, &c.

CASTLE-DURROW. See Durrow.

CASTLE-FINN, a ſmall poſt town of the county of Donegal, ſituated on the river Finn, which is navigable for veſſels of 14 tons from Derry to this place. It is 4½ miles S.W. from Liſford, and 104 N.W. from Dublin. N. lat. 54° 48′. W. long. 7° 27′.

CASTLE-GUARD, a mount near Ardee, county of Louth, Ireland, which has been generally conſidered as a Daniſh fort. It is entirely artificial, and encompaſſed with a double ditch and vallum. It is now all planted with wood, and looks very romantic. The perpendicular height of the mount from the bed of its foundation is near 90 feet, and the depth of the main trench betwixt 30 and 40. The circumference at the top is not leſs than 140; and round the foundation upwards of 600 feet. There appear to have been, from foundations yet remaining, two concentric octagonal buildings upon the ſummit of it. One ſeems to have been a ſort of tower or caſtle; the other a kind of breaſtwork, or gallery, by way of parapet or battlements. The uſe as well as origin of this, and ſimilar mounts, has been diſputed.

CASTLEHAVEN, James Touchet, lord Audley, earl of, in *Biography*, a nobleman who lived in the reigns of Charles I. and II. He entered into the ſervice of the confederated Catholics in Ireland, A. D. 1641, and had a command in their ſervice, and afterwards under the king, till the reduction of Ireland by Cromwell. In 1681, and again with ſome little alteration in 1684, he publiſhed "Memoirs concerning the Wars of Ireland," which occaſioned much controverſy, and the firſt edition, together with lord Angleſey's remarks on it, was declared by the king in council to be a *ſcandalous libel* againſt the government. This book was intended to controvert many of the ſtatements in ſir J. Temple's Hiſtory of the Iriſh Rebellion, and will of courſe be conſulted by thoſe who wiſh to collect from the jarring accounts of prejudiced writers a tolerably impartial account of the events which then diſtracted Ireland. Lord Caſtlehaven ſeems to have been much attached to a military life, and his memoirs contain many remarks on the art of war, made by him while ſerving under the prince of Condé. Biſhop Nicholſon's Hiſtorical Library.

Castlehaven, in *Geography*, a harbour on the S.W. coaſt of Ireland, in the county of Cork, which has given name to a ſmall village, and to the adjoining pariſh. It was called by the Spaniards *Porto-Caſtello*, from a caſtle near the entrance, and by the Iriſh *Glen-Barahane*, i.e. glen of Barahane, on account of a deep rocky glen near the church which is dedicated to St. Barahane. The entrance of the harbour is about half a mile wide; it is very clean and ſafe for veſſels, drawing no more than 10 feet water. A body of Spaniards which came to the aſſiſtance of the Iriſh, in 1601, landed here, and intrenched themſelves on the eaſt ſide of the bay, of which ſome veſtiges may ſtill be ſeen. Sir R. Leviſon, an Engliſh admiral, came here and deſtroyed moſt of their veſſels, from which the eaſtern point of the harbour was called *Galleon point*, but his own veſſels ſuffered ſo much from a battery on the ſhore, that he returned with difficulty to Kinſale. The village of Caſtlehaven is 164 miles S.W. from Dublin, and 38 S.W. from Cork. Smith's Cork, &c.

Castlehaven, *Stags of*, a cluſter of rocks, two of them conſiderable, and all of them to be ſeen at high water, lying S.W. of the harbour of Caſtlehaven, in N. lat. 51° 26′, W. long. 9° 7′. M'Kenzie, &c.

CASTLE-HEAD, *Two*, a cape on the S.W. coaſt of Ireland, at the eaſtern extremity of Crookhaven. N. lat. 51° 27′. W. long. 9° 32′.

Castle-head, *Three*, a cape on the S.W. coaſt of Ireland, at the ſouthern extremity of Dunmanus bay, county of Cork. N. lat. 51° 26′. W. long. 9° 44′.

CASTLE-ISLAND, a ſmall iſland near Crookhaven, on the S.W. coaſt of the county of Cork, Ireland. N. lat. 52° 14′. W. long. 9° 19′.

Castle-island, a ſmall town of the county of Kerry, Ireland, formerly called *The caſtle of the iſland of Kerry*. The ruins of the caſtle, which was encompaſſed by the river Mang, ſtill remain. The land about it is very good, ranking among the beſt in Kerry; but it has been very badly managed. The town has decayed much, in conſequence, it is ſaid, of a diviſion of intereſt among the proprietors. It is 9 miles E. from Tralee, and 133 S.W. from Dublin. Smith's Kerry.

CASTLE-KNOCK, a barony of the county of Dublin, Ireland, north of the river Liffy, ſo called from a caſtle of that name, which was formerly a place of conſiderable ſtrength, but was taken by Edward Bruce in 1316. There is much attention paid to huſbandry in this diſtrict; and a very laudable aſſociation has been formed in it, called the *Caſtleknock Farmers' Society*, the object of which is to encourage and reward thoſe labourers in agriculture, with their wives and children, who diſtinguiſh themſelves by their induſtry and ſobriety. This ſociety was eſtabliſhed in 1798, and has been found productive of much benefit. There is an account of it in the *Reports* both of the *Engliſh and Iriſh Societies for bettering the condition of the Poor.*

CASTLE-LYONS, formerly called *Caſtle Lehan*, a market town of the county of Cork, Ireland, pleaſantly ſituated in a fertile country on a ſmall river which joins the

*Bride.* It has a good market for poultry, and has large fairs. The inhabitants are about 1000, and the town ſeems capable of great improvement. The ruin of the caſtle, the reſidence of the earls of Barrymore, which was burned a few years ago, makes a conſpicuous appearance at a great diſtance. Here are a neat church of modern ſtructure, and the ruins of an abbey, the poſſeſſions of which being aſſigned to the firſt earl of Cork, were left by him "to his daughter Barrymore, to buy her gloves and pins." Caſtle Lyons is 111 miles S.W. from Dublin, and about 14 miles N.E. from Cork. Smith's Cork, &c.

CASTLEMAIN, a ſmall town of the county of Kerry, Ireland, ſituated on the river *Main*, or *Mang*, which is deep enough for veſſels of 50 tons or upwards. The caſtle here formerly guarded the paſs over the river, which divided the earl of Deſmond's poſſeſſions from thoſe of Macarthy, and was given up to queen Elizabeth by the laſt earl. Though now in ruins, a conſtable is ſtill appointed to guard it, who has ſome land and privileges annexed to the office. The town is very poor, which is in ſome meaſure occaſioned by the badneſs of the harbour. There is a bar acroſs the mouth of the entrance, and a ſpit of ſand on each ſide of the channel, and there are no land marks which a ſtranger can eaſily underſtand. It is repreſented as too large in moſt old maps, and has been erroneouſly ſpoken of as very ſafe. Near Caſtlemain there is a ſpa, which, according to Smith, contains ſulphur and iron. It is 152½ miles S.W. from Dublin. N. lat. 52° 10′. W. long. 9° 35′. Smith's Kerry, M'Kenzie, &c.

CASTLE-MARTYR, a market and poſt town of the county of Cork, Ireland, belonging to the earl of Shannon, who reſides there, and has paid great attention to its improvement, and to that of the adjoining country. It is a neat, well built town, and well watered by a canal, or artificial river, which ſurrounds lord Shannon's demeſne, as well as the town. Mr. Young mentions the combing buſineſs being carried on extenſively in Caſtle-martyr, but this trade has ſince declined in every part of the country. There is a charter ſchool for 40 boys, to the ſupport of which lord Shannon has largely contributed. This town was made a borough in 1663, and continued to ſend two members to parliament till deprived of this privilege by the union. It is 17 miles E. from Cork, on the road to Youghel, and 123 miles S.W. from Dublin. N. lat. 51° 55′ 30″. W. long. 8° 3′. Smith's Cork, Young, &c.

CASTLE-POLLARD, a market and poſt town of the county of Weſtmeath, Ireland, which is 46 miles N.W. from Dublin, and 11 miles N. from Mullingar.

CASTLEREA, a market and poſt town of the county of Roſcommon, Ireland, which is 84 miles W. by N. from Dublin, and 13½ from Roſcommon.

CASTLEREAGH, a barony of the county of Down, Ireland, ſo called from a caſtle, the ruins of which are about two miles S.E. of Belfaſt bridge.

CASTLE-RISING, is an ancient, though at preſent a very inconſiderable borough-town of Norfolk, England. It was formerly a ſea-port of ſome conſequence, and from its ſtrong caſtle obtained many privileges; but the ſea has deſerted the town, its haven is choaked up with ſand, and the caſtle is in ruins. The latter, with the town, is ſituated on an eminence. The caſtle was built by William d'Albini, earl of Arundel and Suſſex, in the time of Henry I. Three of its towers were defended and maintained by the lords Hunſtanton, Wotton, and Ridon; and to ſupport their men, they had a power given them by a ſtatute of Edward III. to take proviſion of the circumjacent villages, paying for it within 40 days. Caſtle-riſing is 100 miles N. from London, and is an ancient borough by preſcription. The burgeſſes were formerly about fifty, but theſe are now reduced to two perſons; who poſſeſs the privilege of ſending two members to parliament, and each alternately aſſumes the mayoralty of the town. In the vicinity of Caſtle-riſing is a large chace, which poſſeſſes the privileges of a foreſt. The church of this town is a large ancient pile, built in the conventual form, with an ornamented weſt front. The rector has the privilege of proving all wills made in the pariſh, and alſo retains ſome other privileges, reſulting from the cuſtoms of the caſtle. The markets here are diſcontinued, and the town is reduced to 49 houſes and 254 inhabitants. Blomefield's Hiſtory of Norfolk.

CASTLETON, in *Antiquity*, a very ancient edifice in Derbyſhire, ſeated on the ſummit of an almoſt inacceſſible rock, impending at a great height over the mouth of one of the moſt horrid and auguſt caverns which nature ever formed. Mr. King, in the Archæologia (vol. vi.) has very particularly deſcribed this curious remnant of antiquity. This preſents a large niche in the wall of one of the apartments, with a ſingular kind of canopy or ornament at the top, ſuppoſed to have been the "idol-cell," or little idolatrous chapel in Pagan times. This ſuppoſition ſeems to receive ſome ſupport, with reſpect to Caſtleton, from certain ſmall idols which were dug up a few years ago in the neighbourhood. See CASTLE.

CASTLETON, in *Geography*, a townſhip and river of America, in Rutland county, and ſtate of Vermont, 20 miles S.E. of Mount Independence, at Ticonderoga. Lake Bombazon is chiefly in this town, and tranſmits its waters into Caſtleton river; which, riſing in Pittsford, paſſes through this town in a ſouth-weſterly courſe, and falls into Pultney river, in the town of Fairhaven, a little below col. Lyon's iron-works. Fort Warner ſtands in this town. The number of inhabitants is 805.

CASTLE-TOWN, the name of a town in the iſle of Man, which belongs to Great Britain, and is provincially connected with the county of Cumberland. It is the reſidence of the principal officers of the government, and the ſeat of the Manks' parliament. The houſes are ſituated on the oppoſite ſides of a ſmall creek, that opens into a rocky and dangerous bay; the difficulty of entering which injures, in a certain degree, the commerce of the town. The ſtreets are ſpacious and regular, and the houſes are moſtly neat and uniform. In the centre of the town is Caſtle-Ruſhen, a ſolid and magnificent ſtructure of free-ſtone, erected on a rock, and conſidered as the chief fortreſs in the iſland. According to the Manks' traditions, it was built in the year 960, by the Daniſh prince, Guttred, who lies obſcurely buried within its walls. The figure of the caſtle is irregular, and by ſome writers ſaid to bear a great reſemblance to Elſineur, in Denmark. The ſtone glacis which ſurrounds it is ſuppoſed to have been built by cardinal Wolſey. The ſtone-work of the keep and ſeveral interior portions of the building are nearly as entire as when firſt erected, but the other parts have been repaired, as the caſtle has been ſeveral times beſieged. In the keep is a deep dungeon for priſoners, who muſt have been lowered into it by ropes, as there are no ſteps to deſcend by. In this town is a neat and elegant chapel, which was erected between the years 1698 and 1701, and paid for out of the eccleſiaſtical revenues. The firſt ſtone was laid, and the chapel conſecrated, by the good biſhop Wilſon in 1698. Here is alſo a free-ſchool, which was eſtabliſhed by biſhop Barrow, about 1666. The ſchool-houſe was formerly a chapel dedicated to St. Mary, as early as the year 1230. The courts of chancery and common law are held in this town. Here are about 500 houſes. Feltham's Tour through the Iſle of Man, 8vo. 1798.

Castle-town, a ſmall town, or rather village, at the weſtern extremity of the county of Cork, Ireland, ſometimes called *Caſtle-Dermot ;* it is oppoſite to the iſland of Beerhaven, and affords a ſcanty ſupply to veſſels lying in that harbour. It is 186 miles S.W. from Dublin. N. lat. 51° 37′. W. long. 9° 49′.

Castle-town, a townſhip of America, in Richmond county, Staten iſland, New York, which contains 805 inhabitants, including 114 ſlaves. Of its inhabitants 114 are electors.

Castle-town *Delvin*, a market and poſt town of the county of Weſtmeath, Ireland, the caſtle of which gave name to the ſurrounding barony. It is 35 miles N.W. from Dublin, and 10½ miles from Mullingar.

Castle-town *Roche*, a market and poſt-town of the county of Cork, Ireland, thus called from a caſtle that was formerly the ſeat of the lords Roche. It is on the river Awbeg, 115 miles S.W. from Dublin, and about 22 miles from Cork.

CASTLE-TOWNSEND, a ſmall town of the county of Cork, Ireland, on the bay of Caſtle-haven. There is a good fiſhery off this bay, and in it are excellent oyſters. It is 159 miles from Dublin, and 35 from Cork.

CASTLE-WELLAN, formerly Caſtle-Vellin, a market and poſt-town of the county of Down, Ireland, pleaſantly ſituated on the ſide of a ſmall lake of the ſame name. It is 65 miles N. from Dublin, and 9 W. from Downpatrick.

CASTOLA, in *Ancient Geography*, a town of Italy, in Etruria, which was taken by the conſul Fabius.

CASTOLI *Campi*, a mountain of Aſia Minor, in the Doride, according to Xenophon.

CASTOLOGI, a people of Gaul, placed by Pliny in the vicinity of the Atrebatii.

CASTOLUS, a town of Lydia, in Aſia Minor, belonging to the Dorians, called by the Lydians Caſtoli.

CASTOR, in *Aſtronomy*, a moiety of the conſtellation Gemini ; called alſo Apollo.—Alſo, a ſtar in this conſtellation, whoſe latitude for the year 1700, according to Hevelius, was 10° 4′ 23″ N. ; and its longitude 16° 4′ 14″ of Cancer. It is alſo called *Raſalgenze*, *Apollo*, *Aphellan*, *Avelar*, and *Anelar*.

Castor, in *Commerce*. See Beaver, and Castor in *Zoology*.

Castor, or *Caiſtor*, in *Geography*, is a ſmall town of Lincolnſhire, England ; having a weekly market on Monday, and three fairs annually. This place is ſaid to have been a Roman ſtation ; but the only memorials of its fortifications and military character are the traces of an encampment on an eminence, at a place called Caſtle-hill, near the town. Several ſprings iſſue from this eminence, and ſupply the inhabitants with excellent water. The pariſh church is a fine old edifice, ſuppoſed to have been built out of the ruins of the caſtle. The latter ſtructure is called Thongcaſtle, and, according to ſome of our old chronicles, was built by Hengiſt the Saxon ; but this is very improbable, as the moſt eminent hiſtorians have endeavoured to prove, and with every degree of probability, that Hengiſt never penetrated ſo far north into England. Among the ſingular tenures of this country may be noticed one which belongs to this town. A proprietor of an eſtate in this neighbourhood holds it upon the condition of ſending an agent every Palm Sunday to the north porch of the church, where he is enjoined to crack or ſmack, what is here called, a horſe-gad, (a whip) three times while the clergyman is reading the firſt leſſon. He then proceeds into the church, paſſes the pulpit, and performs many other truly ridiculous tricks :—a proof of the folly and ſuperſtition of the age when this ceremony was inſtituted. Caſtor is 156 miles N. from London ; and conſiſts of 202 houſes, with 861 inhabitants.

Castor's *River*, a river of Newfoundland iſland, which diſcharges itſelf in the harbour of St. John's. Its ſize is conſiderable for 15 miles from the ſea.

Castor, *Caſtoreum*, in the *Materia Medica*. This ſubſtance, which may be called an animal gum reſin, is the inguinal gland of the beaver, (erroneouſly ſuppoſed by the ancients to be the teſticle,) which has long been in uſe in medicine, though now but rarely. See Castor in *Zoology*.

The caſtor is brought over in roundiſh but flattened lumps, covered with a tough membranous ſkin. Caſtor is a brittle, reddiſh-brown, friable ſubſtance, of a pungent, bitteriſh, unpleaſant taſte, and an intenſely ſtrong and peculiar ſmell, diſagreeable to moſt organs.

By far the beſt caſtor comes from Ruſſia, and is in rounder and harder maſſes, and its ſmell is ſtronger and more diffuſive. The ordinary ſort, which is in flattened maſſes, is imported from Canada, and other parts of North America.

The odorous and more active part of caſtor is taken up by alcohol, water alone diſſolving chiefly the bitter extractive part ; but the ſcent of caſtor is readily imparted to any liquor with which it is digeſted. Water diſtilled from caſtor becomes ſtrongly impregnated with the flavour, but long keeping and heat diſſipate it.

The only preparation of caſtor in common uſe is the ſimple tincture, made in the proportion of an ounce to a pint of the ſpirit. The doſe is about a dram, and it is ſuppoſed to poſſeſs pretty ſtrong nervine and anti-hyſteric properties, and with this view is often combined with valerian, aſafœtida, or tonics.

By the analyſis of Bullion la Grange, it appears to conſiſt of a mucilage, a bitter extract, a reſin, and an eſſential oil, in which laſt the odorous principle ſeems chiefly to reſide, and a flaky cryſtalline matter much reſembling adipocire, or the ſimilar matter contained in biliary calculi.

Castor *Oil*, *Oleum Ricini*. The ſeed of the *Palma Chriſti* (Ricinus *Communis,*) is a whitiſh kernel encloſed in a brown acrid huſk, which, taken entire, excites pretty violent vomiting and purging. Theſe ſeeds contain a large quantity of a mild nearly inſipid oil, of which from a third to a fourth of the weight may be extracted, and is the common caſtor oil of the ſhops. It is imported largely from the Weſt Indies, where it forms one of the commoneſt domeſtic medicines for moſt occaſions.

Genuine caſtor oil is very thick and viſcid, of a light amber or ſtraw colour, with ſcarcely any ſmell or taſte. It becomes beautifully tranſparent by ſubſidence, and a quantity of mucilage falls ſlowly to the bottom of the veſſel.

The oil is prepared in two different ways, either by ſimple expreſſion, without previous preparation, or by decoction. For the latter method, the nuts are beaten in deep wooden mortars, and then thrown into iron boilers filled with water, and ſlowly brought to a boiling heat with conſtant ſtirring. The oil riſes as a ſcum at the top, which is ſimply ſtrained and bottled. According to Dr. Wright, (Medical Journal for 1787,) the oil thus prepared is much milder than that obtained by preſſure, on account of the mucilaginous and acrid part which the compreſſion forces out of the nut and mixes with the oil.

The very mildeſt and fineſt Jamaica oil is very limpid, and nearly colourleſs, and has ſcarcely more taſte and ſmell than fine olive oil, and its effects are proportionably milder.

Caſtor oil is one of the moſt valuable of all the purgative medicines which we poſſeſs. In the doſe of about half an ounce to three quarters for an adult, it uſually operates by ſtool, ſpeedily and mildly, with but little griping, though the meaſure of effect muſt be much determined by the purity and fineneſs of the oil, the ſtrong-ſmelling and coarſer kind often producing ſome uneaſineſs in the bowels. On account of its general mildneſs, it is the medicine moſt commonly ſelected for puerperal women, and thoſe of very delicate habits, and children. Its virtues are alſo deſervedly extolled in the ſeverer inflammatory and ſpaſmodic affections of the bowels, in enteritis, colica pictonum, &c. The oil, when taken unmixed, always paſſes through, in part undecompoſed, and may be ſeen in the fæces.

The exhibition of the oil is often attended with ſome difficulty, particularly as oil is ſo little uſed for culinary purpoſes, that moſt perſons have an averſion to the ſenſation of any kind of oil clinging to the mouth and fauces. In general, if the mouth is previouſly well moiſtened with peppermint-water, or any other ſtrong-taſted agreeable liquor, and the oil, floating unmixed in a cup of water, be ſwallowed quickly in large mouthfuls, it is not felt in the mouth, and all diſguſt is avoided. But when this cannot be well-managed, and the diſguſt to the unmixed oil is inſuperable, it may be readily made into an emulſion with yolk of egg and ſugar, and any aromatic, which completely covers all the ſlight nauſeous taſte which the raw oil leaves in the throat. In this way, however, the purgative power muſt be diminiſhed, that is, all that depends on the mere oil, which is not inconſiderable, ſince an equal quantity of ſallad oil will prove, in ſome degree, purgative, apparently by its mere lubricating effect.

The very frequent uſe of this oil is rather of late date in this country; though it has been long known and reſorted to in particular caſes.

Where the oil is naturally unuſually acrid, or has become ſo by long keeping, it has been propoſed to agitate it with warm water, with a view of diſſolving out part of the acrid mucilage; a method which will probably ſucceed to a certain degree.

Castor, the *Beaver,* in *Zoology,* a genus of quadrupeds which have the front teeth in the upper jaw truncated, and hollowed in a tranſverſe angle; thoſe in the lower jaw tranſverſe at the tips; grinders four in each jaw: tail long, depreſſed, and ſcaly: clavicles perfect, or collar bones in the ſkeleton.

Two ſpecies only of this genus are at preſent known, *Caſtor Fiber,* the common beaver; and the Chili beaver, *Caſtor Huidobrius,* or as it is called by the natives of Chili, Guillino.

Castor *Fiber* has an ovate, flat, and naked tail, by which character it is immediately diſtinguiſhed from the other ſpecies, the tail of which is long, of a lanceolate form, and hairy. The colour of this animal is ſuſceptible of conſiderable variation in different climates: moſt commonly it is of a reddiſh or cheſnut brown. In northern countries they are duſky, and even ſometimes of an intenſe black; but theſe latter are rare. Others are grey, cream-coloured, or white; and inſtances have occurred, in which thoſe of a light-colour have been ſpotted with brown or black. Thoſe of Canada are cheſnut, and among the Illinois, they are yellow, or olivaceous brown.

The beaver is a native of the northern parts of Europe, Aſia, and North America, abounding moſt in cold regions, and becoming gradually leſs common towards the ſouth. In America they are found from the 30th degree of north latitude to beyond the 60th. In ancient times the beaver was a more general inhabitant of Europe than it is at preſent, eſpecially in France, Spain, Italy, Greece, and Egypt, where they are now ſcarcely ever obſerved, and in Britain they have been wholly extirpated for ſome centuries. That it was formerly an indigenous inhabitant of this country is certain upon the credit of the moſt authentic records. The lateſt accounts we have of them is in Giraldus Cambrenſis, who travelled through Wales in 1188: he gives a brief hiſtory of their manners; and adds, that in his time they were only found in the *Teivi* river. Several pools of water in the northern parts of the Cambrian principality ſtill bear the name of *Llyn yr afange,* the pool (or lake) of beavers. There are two, if not more, of the pools amidſt the wilds of the Snowdonian mountains that bear this name to the preſent day; there is one in particular in the vale of Nant Francon near Beddkelert, in Caernarvonſhire, and another in the river Conway, a few miles above Llanrwſt. Theſe were evidently the haunts of beavers. It is however believed that the beaver was uncommon in Britain before the tenth century, for by the laws of Howel dda (*Leges Wallicæ*) the price of the beaver's ſkin (*Croen Lloſtlydan*) was eſtimated at 120 pence: a great ſum in thoſe days.

Beavers, when full-grown, are nearly three feet in length from the tip of the noſe to the inſertion of the tail; the tail itſelf meaſures almoſt twelve inches long; and the weight of the whole animal is from fifty to ſixty pounds. Of all quadrupeds the beaver is conſidered as poſſeſſing the greateſt degree of natural ſagacity in conſtructing its habitation, though in other reſpects it is believed inferior to many. If we conſider this animal in a ſtate of nature (ſays Buffon) or rather in his diſperſed and ſolitary ſtate, we ſhall find that his internal qualities are not ſuperior to other animals; he has neither the genius of a dog, the ſagacity of an elephant, nor the cunning of a fox, and he is rather remarkable for external ſingularities than for any apparent ſuperiority of internal qualities. The beaver is the only animal that has a flat, oval tail, covered with ſcales, which ſerves as a rudder to direct his courſe in the water; the only one that has the hind-feet webbed, and the toes of his fore-feet ſeparate, which he uſes to convey food to his mouth; the only one which reſembles a land animal in his fore-parts, and approaches the nature of an aquatic one in the poſterior; in ſhort, he forms the ſame ſhade between quadrupeds and fiſhes, as the bat forms between quadrupeds and birds. But theſe ſingularities would be rather defects than perfections, if the beaver did not derive from this conformation peculiar advantages adapted to its mode of life, which render it ſuperior to all other animals.—It is generally allowed, ſays this writer, in another place, that the beaver, far from having a ſuperiority over other animals, ſeems to be inferior to many of them in his merely individual qualities, and this fact he aſſerts he was able to confirm, by having had a young beaver, which was ſent him from Canada alive, in his poſſeſſion for more than a twelve-month. This animal is mild, peaceable, and familiar; it was rather inclined to be gloomy and melancholy, had no violent or vehement paſſions, its movements were ſlow; it made few efforts except to gain its liberty, which it frequently attempted by gnawing the gate of its priſon, but without violence or precipitation. In other reſpects it ſeemed to be perfectly indifferent; forming no attachments, and being as little inclined to offend as pleaſe. He was inferior to the dog in the relative qualities which might make him approach to man: he appeared neither formed to ſerve, command, or even to aſſociate with any ſpecies but his own: his talents were repreſſed by ſolitude, and it ſeemed only by ſociety with his own kind, thoſe talents could be brought into action. When alone he had little induſtry, few tricks, and not ſufficient diſtruſt to avoid the moſt obvious ſnares. Far from attacking any other animal, he had ſcarcely the art to defend himſelf, always preferring flight to combat; he reſiſted only when driven to an extremity, and then bit very hard with his teeth. Such traits of the manners of this animal in a ſtate of captivity are ſingular. We are not, however, ſatisfied that the obſervations of Buffon will apply to the beaver generally; in one reſpect he is evidently incorrect; we are aſſured by the beſt authors that the beaver may be eaſily tamed. M. Klein tells us he kept a beaver for ſeveral years, which followed him, or would go in queſt of him as a dog would ſearch for his maſter; Kalm ſpeaks decidedly to the ſame effect; he obſerves, in his travels, that he has ſeen beavers that would go out to fiſh, and bring the prey home to their maſters; nay, that they would even follow men and dogs, go with them into the water, jump into the water, and come up again with the fiſh; and M. Gmelin affirms that he ſaw a beaver in Siberia, which had been reared in the houſe, who would wander to a conſiderable diſtance, ſometimes returning with a female whom he would ſuffer to depart alone after the ſeaſon of love.

Authors have ſaid that the beaver, being an aquatic animal, could not live ſolely on land; an opinion which Buffon endeavours to prove erroneous; he obſerves that the young beaver before mentioned when taken to the water was afraid of it, and refuſed to go in; when plunged into the baſon there was a neceſſity to hold him there by force, though in a few minutes he became perfectly reconciled; afterwards, when left to his liberty, he would frequently return to it of himſelf, and even roll upon the dirt, or wet pavement. One day he eſcaped and deſcended by a ſtair-caſe into the ſubterraneous vaults in the royal garden, and ſwam a conſiderable time in the ſtagnant water at the bottom of them, yet no ſooner did he perceive the light of the torches which were brought to ſearch for him, than he returned, and ſuffered himſelf to be taken without the leaſt reſiſtance. He was familiar, but not fawning, and was ſure to expreſs his deſire for ſomething to eat from thoſe he ſaw at table, which he ſignified by a ſmall plaintive cry, and ſome geſtures with his fore-paws: when he obtained a morſel he carried it off and concealed it, that he might eat it at his eaſe. He ſlept pretty often, and then laid on his belly. No food came amiſs to him, meat excepted, which he refuſed either raw or dreſſed. It was remarkable that he gnawed every thing within his reach, inſomuch that it had been found neceſſary to line with tin the barrel in which he had been brought from Canada.

The favourite reſorts of the beaver are retired woody ſituations on the borders of lakes, rivers, and other freſh waters; yet they are ſometimes found on the ſea ſhores near the influx of great rivers, where the waters are leſs ſaline than in the open ſea.

According to Buffon, the beavers begin to aſſemble in the month of June or July, for the purpoſe of uniting into ſociety. They arrive in numbers from all parts, and ſoon form a troop of two or three hundred. The place of rendezvous is generally the ſituation fixed for their eſtabliſhment, and always on the banks of ſome water. If the waters be flat, and never riſe above their ordinary level, as in lakes, the beaver makes no banks or dam; but in rivers or brooks, where the waters are ſubject to conſiderable riſings and fallings, they conſtruct a bank, and by this artifice form a pond, or piece of water, which remains always at the ſame height. The bank traverſes the river, from one ſide to the other, like a ſluice, and it is often from eighty to a hundred feet long, by ten or twelve broad at the baſe. This pile, for animals of ſo ſmall a ſize, appears to be enormous, and ſuppoſes an incredible labour; but the ſolidity with which the work is conſtructed is ſtill more aſtoniſhing than its magnitude. The part of the river where they erect this bank is generally ſhallow. If they find on the margin a large tree, which can be made to fall into the water, they begin with cutting it down, to form the principal part of their work. This tree is often thicker than the body of a man. By gnawing the foot of the tree with their four cutting teeth, they accompliſh their purpoſe in a very ſhort time, and always make the tree fall acroſs the river. They next cut the branches from the trunk to make it lie level. Theſe operations are performed by the whole community. Several beavers are employed in gnawing the foot of the tree, and others in lopping off the branches after it has fallen. Others at the ſame time traverſe the banks of the river, and cut down ſmaller trees from the ſize of a man's leg to that of his thigh. Theſe they dreſs and cut to a certain length to make ſtakes of them, and firſt drag them by land to the margin of the river, and then by water to the place where the building is carrying on. Theſe piles they ſink down, and interweave the branches with the larger ſtakes. This operation implies the vanquiſhing of many difficulties; for to dreſs theſe ſtakes, and to put them in a ſituation nearly perpendicular, ſome of the beavers muſt elevate with their teeth the thick ends againſt the margin of the river, or againſt the croſs-tree, while others plunge to the bottom and dig holes with their fore feet to receive the points that they may ſtand on end. While ſome are labouring in this manner, others bring earth, which they plaſh with their fore feet, and tranſport it in ſuch quantities, that they fill with it all the intervals between the piles. Theſe piles conſiſt of ſeveral rows of ſtakes, of equal height all placed oppoſite to each other, and extend from one bank of the river to the other. The ſtakes facing the under part of the river are placed perpendicularly; but the reſt of the work ſlopes upwards to ſuſtain the preſſure of the fluid, ſo that the bank, which is ten or twelve feet wide at the baſe, is reduced to two or three at the top. It has therefore not only the neceſſary thickneſs and ſolidity, but the moſt advantageous form for ſupporting the weight of the water, for preventing its iſſue, and for repelling its efforts. Near the top or thinneſt part of the bank they make two or three ſloping holes to allow the ſurface water to eſcape, and theſe they enlarge or contract, according as the river riſes or falls; and when any breaches are made in the bank by ſudden or violent inundations they know how to repair them as ſoon as the water ſubſides.—It would be ſuperfluous after this account of their public works, to give a detail of their particular operations, were it not neceſſary in a hiſtory of theſe animals to mention every fact, and were not the firſt great ſtructure made with a view to render their ſmaller habitations more commodious. Theſe cabins, or houſes, are built upon piles near the margin of the pond, and have two openings, the one for going to the land, and the other for throwing themſelves into the water. The form of the edifices is either oval or round, ſome of them larger and ſome leſs, varying from four or five, to eight or ten feet in diameter. Some of them conſiſt of three or four ſtories, and their walls are about two feet thick, raiſed perpendicularly upon planks, or plain ſtakes, which ſerve both for foundations and floors to their houſes. When they conſiſt of but one ſtory, the walls riſe perpendicularly only a few feet, afterwards aſſume a curved form, and terminate in a dome, or vault, which ſerves them for a roof. They are built with amazing ſolidity, and neatly plaſtered both without and within. They are impenetrable to rain, and reſiſt the moſt impetuous winds. The partitions are covered with a kind of ſtucco, as nicely plaſtered as if it had been executed by the hands of man. In the application of this mortar their tails ſerve for trowels, and their feet for plaſtering. They employ different materials, as wood, ſtone, and a kind of ſandy earth, which is not ſubject to diſſolution in water. The wood they uſe is almoſt all the light and tender kinds, as alder, poplar, and willow, which grow generally on the banks of rivers, and are more eaſily barked, cut, and tranſported, than the heavier and more ſolid ſpecies of timber. When they once attack a tree, they never abandon it till they cut it down and carry it off. They always begin the operation of cutting at a foot or a foot and a half above the ground. They labour in a ſitting poſture; and beſides the convenience of this ſituation, they enjoy the pleaſure of gnawing perpetually the bark and wood, which are moſt agreeable to their taſte; for they prefer freſh bark and tender wood to moſt of their ordinary aliment. Of theſe proviſions they lay up ample ſtores, to ſupport them during the winter; but they are not fond of dry wood, and make occaſional excurſions during the winter ſeaſon for freſh proviſions in the foreſts. It is in the water, or near their habitations, that they eſtabliſh their magazines. Each cabin has its own magazine, proportioned to the number of its inhabitants, who have all a common right to the ſtore, and never pillage their neighbours. Some villages are compoſed of 20 or 25 cabins, but ſuch eſtabliſhments are rare; and the common republic ſeldom exceeds, 10 or 12 families, each of which has its own quarter of the village, its own magazine, and its ſeparate habitation. They will not allow ſtrangers to ſettle in their neighbourhood. The ſmalleſt cabins contain two, four, or ſix; and the largeſt eighteen, twenty, or it is ſaid even ſometimes thirty beavers. They are almoſt always equally paired, there being the ſame number of females as of males. Thus, on a moderate computation, the ſociety is often compoſed of 150 or 200, which all at firſt laboured jointly in raiſing the great public building, and afterwards in ſelect tribes or companies, in making particular habitations. In this ſociety, however numerous, an univerſal peace is maintained. Their union is cemented by common labours; and it is rendered perpetual by mutual convenience, and the abundance of proviſions which they amaſs and conſume together. Moderate appetites, a ſimple taſte, an averſion againſt blood and carnage, diveſt them of the idea of rapine and war. They enjoy every poſſible good. Friends to each other, if they have ſome foreign enemies, they know how to avoid them. When danger approaches, they acquaint one another by ſtriking their tails on the ſurface of the water, the noiſe of which is heard at a great diſtance, and reſounds through all the vaults of their habitations. Each takes his part; ſome plunge into the lake, others conceal themſelves within their walls, which are ſo firmly conſtructed that no animal will attempt to burſt through, or overturn them. Theſe retreats are not only very ſafe, but neat and commodious. The floors are ſpread over with verdure; the branches of the box and fir ſerve them for carpets, upon which they permit not the ſlighteſt dirtineſs. The window that faces the water anſwers for a balcony to receive the freſh air, and to bathe. During the greateſt part of the day they ſit on end, with their head and anterior parts of the body elevated, and their poſterior parts immerſed in the water. This window is made with caution, the aperture being ſufficiently raiſed to prevent its being ſtopped up with the ice, which in the climates inhabited by the beaver is often two or three feet thick. When this happens, they ſlope the window, cut obliquely the ſtakes which ſupport it, and thus open a communication with the unfrozen water. This element is ſo neceſſary, or rather ſo agreeable to them, that they can ſeldom diſpenſe with it. They often ſwim a long way under the ice, and it is then that they are moſt eaſily taken, by attacking the cabin on one hand, and at the ſame time watching at the hole made at ſome diſtance, where they are obliged to repair for the purpoſe of reſpiration. The continual habit of keeping their tail and poſterior part in the water appears to have changed the nature of their fleſh. That of their anterior parts, as far as the reins, has the taſte and conſiſtence of the fleſh of land or air animals; but that of the tail and hinder parts has the odour and all other qualities of fiſh. The tail, which is a foot long, an inch thick, and five or ſix inches broad, is even an extremity or genuine portion of a fiſh attached to the body of a quadruped; it is entirely covered with ſcales, and with a ſkin perfectly ſimilar to thoſe of large fiſhes: they may be ſcraped off with a knife, and after falling, they leave an impreſſion on the ſkin as is obſervable in fiſhes under ſimilar circumſtances.

The beavers aſſemble in the beginning of ſummer. They employ the months of July and Auguſt in the conſtruction of their bank and cabins. In September they collect their proviſions of bark and wood; and afterwards enjoy the fruits of their labour and foreſight. At this ſeaſon they couple, each, as it is affirmed, ſelecting its mate; and abiding with her by choice rather than indulging in a promiſcuous intercourſe with the reſt of the females. Thus they paſs the autumn and winter together, during which time they occaſionally go out on excurſions to bring in a ſupply of freſh bark, which they prefer to that, which, by remaining long in their magazine, has become dry or hard, or has been by accident moiſtened with water. The females are ſaid to be pregnant for four months; they bring forth at the end of the winter, and generally produce two young, rarely three, or four, which laſt they ſeldom if ever exceed, and nature has provided the female with four teats for ſuckling its young. About the end of winter the females are left by the males, who retire to the country to enjoy the products of the ſpring. They may occaſionally reviſit their cabins, but never remain long in them. The females continue in their cabins, and are occupied in nurſing, protecting, and rearing their young, which at the end of a few weeks, are in a condition to follow their dams. The females now in their turns make frequent excurſions, and recruit their ſtrength with air, and freſh bark, and other herbage. Thus they paſs the remainder of the ſummer till autumn, when the whole ſociety again aſſembles. But even during the ſummer, while thus diſperſed, ſhould their banks or cabins be over-thrown by inundations, they ſuddenly collect their forces, and repair the breaches which have been made. They are much more attached to ſome places than others, and have been obſerved to return every autumn, after their works have been repeatedly demoliſhed to repair them, till haraſſed by this perſecution, and weakened by the loſs of ſeveral of their troop, they have with one conſent deſerted it, and retired to ſome more ſecure and leſs frequented neighbourhood.

Winter is the ſeaſon principally allotted for hunting the beaver, as it is only then their fur is in perfection; and when, after their dwellings are demoliſhed, a number of them are taken, their ſociety, it is ſaid, is never reſtored, but thoſe which eſcape become houſeleſs wanderers. Their genius is overcome by apprehenſion, and they never more attempt to exert it, but conceal themſelves in holes under ground, and reduced to the condition of other animals they lead a timid life, employing themſelves only to ſatisfy their immediate wants, and they retain no longer thoſe qualities which they ſo eminently poſſeſs in their ſocial ſtate. Theſe are the unaſſociated beavers mentioned by authors, who live ſolitary, and inſtead of conſtructing cabins, or vaulted and plaſtered receptacles, only form holes for their dwellings in the banks of rivers. Theſe are commonly termed terrier beavers, and their fur is conſidered as far leſs valuable than that of the beavers which herd together in ſocieties. All the European beavers are ſolitary: it is only in the vaſt and ſcarcely habitable tracts of the northern regions thoſe animals can be ſufficiently ſecure from the intruſion of man, to form the commodious habitations already mentioned.

Many writers, not content with aſcribing to the beaver ſocial manners, and evident talents for architecture, have attributed to them general ideas of policy and government. They have aſſerted that when their ſociety is formed, they reduce travellers and ſtrangers of their own ſpecies into ſlavery; that they employ them in carrying their clay and wood; that they treat in the ſame manner the idle who will not, and the old who cannot, work; that is, throw them upon their backs, and uſe them as ſo many vehicles to carry their materials: that they never aſſemble in an even number, in order that they may have in all their deliberations a caſting vote; that each tribe has its chief; and that they have centinels eſtabliſhed for the public ſecurity. Ælian, and others of the ancients have pretended further, that, when cloſely purſued by the huntſman, they would ſtop ſhort, and tear off the ſecretory glands of caſtor to ſatisfy the cupidity of the hunter; and when thus mutilated would preſent themſelves to obtain mercy. Such reports are abſurd, and are completely exploded by modern obſervers.

The fur of the beaver is more beautiful and thick than that of the otter; it is compoſed of two ſorts of hair; the one, ſhort and buſhy, ſoft as down, and impenetrable to the water, immediately covers the ſkin; the other, longer, briſtly, and ſhining, but thinner, ſerves as an upper coat, and defends the former from filth and duſt. The latter is of little value, it is only the firſt that is uſed in our manufactures. The uſe of its fur in the hat manufactories is ſufficiently well known: attempts have been alſo made in France to weave the hair of beavers with the Segovian wool, but which in the event was found to form a cloth of no very excellent quality. The blackeſt furs are generally thickeſt, and conſequently moſt eſteemed; nor is the fur of the ſolitary beavers equal to that of thoſe who live in ſociety. Theſe animals, like all other quadrupeds, ſhed their hair in ſummer; and therefore the furs of ſuch as are taken in that ſeaſon are of little value; they are called the ſtage-beavers, being thoſe which the Indians kill on their ſtages or journies, and are eſteemed the worſt ſkins. Beaver ſkins are alſo diſtinguiſhed by the name of coat beaver, and parchment beaver, by traders; the firſt is that which is worn by the Indians as coverlets, and the other is ſo named becauſe the lower ſide reſembles parchment.

In hunting beavers, the ſavages moſt commonly either ſhoot them or take them in traps. In the firſt inſtance they always proceed againſt the wind, for the beavers are ſhy, quick in hearing, and of a keen ſcent. The beavers are generally taken by ſhooting while they are at work, or when on ſhore feeding on the poplar bark. If they hear any noiſe when at work, they immediately jump into the water, and continue there ſome time; and when they riſe, it is at a diſtance from the place where they plunged in. The traps laid for them are nothing more than poplar ſticks laid in a path near the water; which when the beaver begins to feed upon they cauſe a large log of wood to fall on their necks, which is put in motion by their moving the ſticks, and of courſe requires an ingenious contrivance. The ſavages generally prefer the latter mode of capture, becauſe it does not damage their ſkins. In the winter they take the beaver in another manner; they break the ice in two places at a diſtance from the cabins, the one behind the other; after which they take away the broken ice with a kind of racket, the better to obſerve where to place the ſtakes. To theſe they faſten nets, which have large meſhes, and are ſometimes 18 or 20 yards in length. When theſe are fixed, they proceed to demoliſh the houſe, and turn in a dog, which terrifying the beaver, he dives into the water, where he is ſoon entangled in the net and taken.

The ſkins of the beaver form a prodigious article of commerce; many thouſands are annually imported by the Hudſon's bay company into England from North America, which is the principal though not the only ſource from which our beaver ſkins are obtained; Ruſſia furniſhes a vaſt number. But beſides the fur, which is a valuable article, the beaver affords a ſubſtance of conſiderable utility in medicine, the drug *caſtoreum* or *caſtor*, which ſee. This ſubſtance is ſecreted in two large cellular glands ſituated near the genital organs and the anus. Each animal affords about two ounces of this ſubſtance, and it is common to both ſexes. It is pretended by ſome that the beavers extract this liquid by preſſing the bladders with the feet; that it gives them an appetite when diſguſted with food, and that the ſavages to entrap them wet the ſnares with it. Others affirm, however, with greater probability, that the animal employs this oily ſubſtance to anoint its fur and render it more impervious to the water. The American ſavages are ſaid to obtain an oil from the tail of the beaver, which they apply as a topical remedy for different complaints. The fleſh is ſeldom eaten; though fat and delicate to appearance, it is extremely bitter and unpalatable. Beavers are ſaid to couple when a twelve month old, and it has been hence inferred that the beaver does not commonly live to the age of 20 years as ſome writers affirm. The American beavers feed principally on the magnolia glauca, fraxina americana, and a variety of roots, among which they ſeem to prefer thoſe of the acorus calamus, or calamus aromaticus; the poplar, aſpin, and birch are the favourite food of the European beavers.

The reader deſirous of obtaining a further hiſtory of the beaver may conſult the following publications with advantage. Præſide, Diſputatio de Caſtore vel Fibro, &c. Johan. Chriſti. Frommann, 1686. Præſide, Diſſertatio; Caſtor breviter delineatus, &c. Laur. Normanno, Upſ. 1687. Berättelſe om Bäfverns natur, &c. Acad. Handling, Nils Giſler, 1756. Hiſtoria naturalis Caſtoris et Moſchi, &c. J. G. Linck. Lipſiæ, 1786. Anatomy of a female Beaver, and an account of Caſtor found in her, vol. 38. Phil. Tranſ. Phyſikaliſch-anatomiſche bemurkungen über den biber. C. Gottwaldt. Nürnb. 1782. Obſervations ſur le Caſtor, ſuivies de l'analyſe chimique du Caſtoreum. Journ. de Phyſique, T. 40.

Castor *huidobrius* differs from the former in having the tail long, lanceolate, and hairy; the fore feet lobed and the hind feet palmated.

This is the guillino beaver of Pennant, and Chili beaver of later Engliſh writers. It is a ſingular animal, and appears to have been firſt deſcribed by Molina in his Natural Hiſtory of Chili. This writer (to whom later authors ſeem principally indebted for their account of this animal) informs us that it inhabits the deepeſt parts of the lakes and rivers of Chili, that it feeds principally on fiſh, and crabs; and does not conſtruct any regular habitation like the common beaver; nor does it afford any of the ſebaceous matter called caſtor. The length is about three feet. The head is nearly ſquare; the eyes ſmall; the ears rounded and ſhort, and the ſnout obtuſe; in each jaw are two ſharp and ſtrong cutting teeth, and the grinders like thoſe of the other ſpecies of beaver. The body is very broad, and covered like the beaver with two ſorts of hair, the undermoſt of which is finer than that of the rabbet, and is in much eſteem with the manufacturers, being wrought into a kind of cloth which has the ſoftneſs of velvet, and is alſo uſed in the manufacture of hats. The colour of this animal is cinereous above, and whitiſh on the belly. The toes of the fore feet are lobated, or bordered with a membrane, and the hind feet are webbed; the toes five in number on each foot. The tail is compreſſed, and is beſides diſtinguiſhed from that of the common beaver in being lanceolate and hairy, a character by which the ſpecies may be eaſily known. This is repreſented as a bold, and even fierce animal, and as having the power of remaining for a conſiderable length of time under water. The female produces from two to three young at a birth.

The Zibethicus, or muſk-rat, is arranged by ſome as a ſpecies of caſtor; but as it appertains more clearly to the rat tribe, recent naturaliſts refer it to the genus Mus. See Mus *zibethicus*.

Castor *and Pollux*, in *Aſtronomy*. See Gemini.

Castor *and Pollux*, in *Meteorology*, a fiery meteor, which at ſea appears ſometimes ſticking to a part of the ſhip, in form of one, two, or even three or four fire-balls: when one is ſeen alone, it is more properly called *Helena;* two are denominated Caſtor and Pollux, and ſometimes Tyndaridæ.

Caſtor and Pollux are called by the Spaniards, San Elmo; by the French, St. Elme, St. Nicholas, St. Clare, St. Helene; by the Italians, Hermo; by the Dutch, Vree Vuuren.

Caſtor and Pollux are commonly judged to portend a ceſſation of the ſtorm, and a future calm; being rarely ſeen till the tempeſt is nigh ſpent. Helena alone portends ill, and indicates the ſevereſt part of the ſtorm yet behind.

When the meteor ſticks to the maſts, yards, &c. they conclude, from the air's not having motion enough to diſſipate this flame, that a profound calm is at hand; if it flutter about, it indicates a ſtorm.

Castor *and Pollux*, in *Fabulous Hiſtory*, were two brothers, the ſons of Tyndareus or Tyndarus, king of Sparta, by his wife Leda, and they had two ſiſters, the famous Helena and Clytemneſtra, the wife and murderer of Agamemnon. According to the fable, Jupiter had an amour with Leda, in the form of a ſwan, and ſhe brought forth two eggs, each containing twins. From that impregnated by Jupiter proceeded Pollux and Helena, who were both immortal: from the other Caſtor and Clytemneſtra, who being begotten by Tyndarus, were both mortal. They were all, however, called by the name "Tyndaridæ." Theſe two brothers entered into an inviolable friendſhip; they accompanied the other noble youths of Greece in the expedition to Colchis, and ſignalized themſelves by their valour. The fable adds, that when Caſtor died, his brother Pollux, who was immortal, prayed to Jupiter that he might ſhare his immortality with him; which being granted, they lived and died by turns, and being tranſlated into the heavens, they formed the conſtellation Gemini. As they were diſtinguiſhed by their courage, particularly in their conteſts with pirates, they received divine honours, and ſeamen paid them peculiar devotion. Accordingly, the veſſel which carried Paul, (Acts xxviii. 11.) was called Dioſcuri, or Caſtor and Pollux, becauſe their images were either carved or painted on the prow. There was beſides ſome other deity on the ſtern; and theſe were regarded as the patrons and tutelary gods of the veſſel.

A martial dance, called the "Pyrrhic," or "Caſtorian" dance, was invented in honour of thoſe deities, whom the Cephalenſes placed among the dii magni, and offered to them white lambs. The Romans alſo rendered them particular honours, on account of the aſſiſtance they are ſaid to have given them in an engagement againſt the Latins; in which, appearing mounted on white horſes, they turned the ſcale of victory in their favour, for which a temple was erected to them in the forum.

CASTOREA, in *Botany*. Plum. See Duranta *Plumierii*.

CASTOREUM, in the *Materia Medica*. See Castor.

CASTORIA, in *Geography*, a lake of European Turkey, in the province of Macedonia, and alſo a town of the ſame name; 30 miles W. of Edeſſa.—Alſo, a river of European Turkey, which empties itſelf into the lake to which it gives name, in Macedonia; and the name is afterwards changed into Viſtritza.

CASTORUM Lacus, in *Ancient Geography*, *Caſtorum templum*, or *Caſtorum nemus*, a place of Italy, 12 miles from Cremona, according to Tacitus; called *Caſtoris lucus* by Oroſius, where Cecina, Vitellius's general, was defeated by the troops of Otho.

CASTRA, the Latin term for a camp, has given name to a great number of places; ſome of the principal of which we ſhall mention: e. g. Caſtra, a town of India, on this ſide of the Ganges, placed by Ptolemy in the country of the Salacenians.—A place or town of Norica, in the Itin. of Anton.—A town of Macedonia, marked in Anton. Itin. on the route from Otranto to Conſtantinople, in paſſing by Macedonia, between Scirtiana and Heraclea.—A place of Italy, N.E. of Tergeſte.—C. *Alexandri*, a place of Africa, in Marmarica; and alſo a place of Egypt near Peluſium.—C. *Annibalis*, a port of Italy, in Magna Grecia, on the peninſula formed by the gulfs Scyllaceus and Tarentinus, according to Pliny.—C. *Cæcilia, Caceres*, a town of Spain, in Luſitania, S. of Ruſticiana.—C. *Cornelia*, a place of Africa Propria, according to Pliny and Mela. It is called by Julius Cæſar and Ptolemy, C. *Corneliana;* and is the place where Scipio Africanus firſt encamped when he landed in Africa. It occupied a tongue of land, called "Gellah," about 2 ſtadia broad, and was the moſt northern and rugged part of the promontory of Apollo, ſituate in Africa, N. of Carthage.—C. *Cyri*, the place where Cyrus encamped when he marched his army into Lydia, againſt Cræſus, mentioned by Quintus Curtius and Arrian.—C. *Dellia*, or *Lælia*, a place of Africa, near C. *Cornelia* and the river Bagradas, according to Mela.—C. *Dan*, a place of Paleſtine, between Zorah and Eſhtaol, in the tribe of Dan, where the ſpirit of the Lord began to move Samſon. Judges xiii. 25. Joſh. xix. 41.—Alſo, another place of Paleſtine, in the tribe of Judah, behind Kirjath-Jearim. Judges xviii. 12.—C. *Exploratorum*, a place in the Iſle of Albion, mentioned in the ſecond route of Antonine's Itinerary. If *Blatum Bulgium*, (which ſee) was really at Middleby, as Horſley renders probable, every circumſtance leads us to fix the Caſtra Exploratorum at Netherby, and the moat at a ſmall diſtance from it; for at the former there was a famous Roman town, and at the other an exploratory camp. Both theſe places are at a proper diſtance from Blatum Bulgium on the one hand, and Luguvallium on the other, and ſituated on the military way which led from the one to the other.—C. *Felicia*, a place in the iſland of Sardinia.—C. *Galba*, an epiſcopal ſee of Africa, in Numidia.—C. *Gemina*, a town of Spain, in the diſtrict of Hiſpalis, according to Pliny; which was tributary to the Romans.—C. *Germanorum*, a place of Africa, in Mauritania Cæſarienſis, according to Ptolemy; near a ſmall iſle E. of the promontory of Apollo.—C. *Hannibalis*, *Caſtello*, a place of Italy, in Brutium, at a ſmall diſtance N.E. of Scylacium. See C. *Annibalis*.—C. *Herculis*, a town of Germany, occupied, according to Ammianus Marcellinus, by the Romans. It was one of the ſeven places on the Rhine, which Julian repaired; and was ſituated over-againſt the

the place where Druſus opened a canal for diſcharging the waters of the Rhine into the Iſſel.—C. *Julia*, a town of Spain, placed by Pliny in Luſitania.—C. *Lapidariorum*, a place of Egypt, in the Thebaide.—C. *Mammaria*, a town of Spain.—C. *Monorum*, a place of Aſia, in Meſopotamia, W. of mount Singaræ.—C. *Nova*, a maritime place of Africa, in Mauritania Cæſarienſis, marked in the Itinerary of Antonine on the route from Cala to Rufucurrum, between Taſagora and Ballene.—C. *Poſthumiana*, the camp of Poſthumius, a place of Spain, in the vicinity of Ucubis, fortified and garriſoned by Cæſar.—C. *Prætoria*, a place of Rome, near the porta Viminalis. It was a kind of citadel, according to Pliny, where Tiberius aſſembled the prætorian cohorts. It was encloſed by walls, ditches, and towers, and had a temple, an arſenal, baths, fountains, &c.—C. *Puerorum*, a place of Africa, in Mauritania Cæſarienſis, between the colony of Gilva and Portus Divinus.—C. *Regina*, a place in Rhætia.—C. *Seberianenſis*, an epiſcopal ſee of Africa, in Mauritania Cæſarienſis.—C. *Trajana*, a place in the vicinity of Ribnik, a ſmall town on the banks of the Aluta, in Dacia.—C. *Tyriorum*, a particular place of Egypt, in the environs of Memphis, according to Herodotus.—C. *Vali*, an epiſcopal ſee in the patriarchate of Antioch, under the metropolis of Anazarbus.

END OF VOL. VI.

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